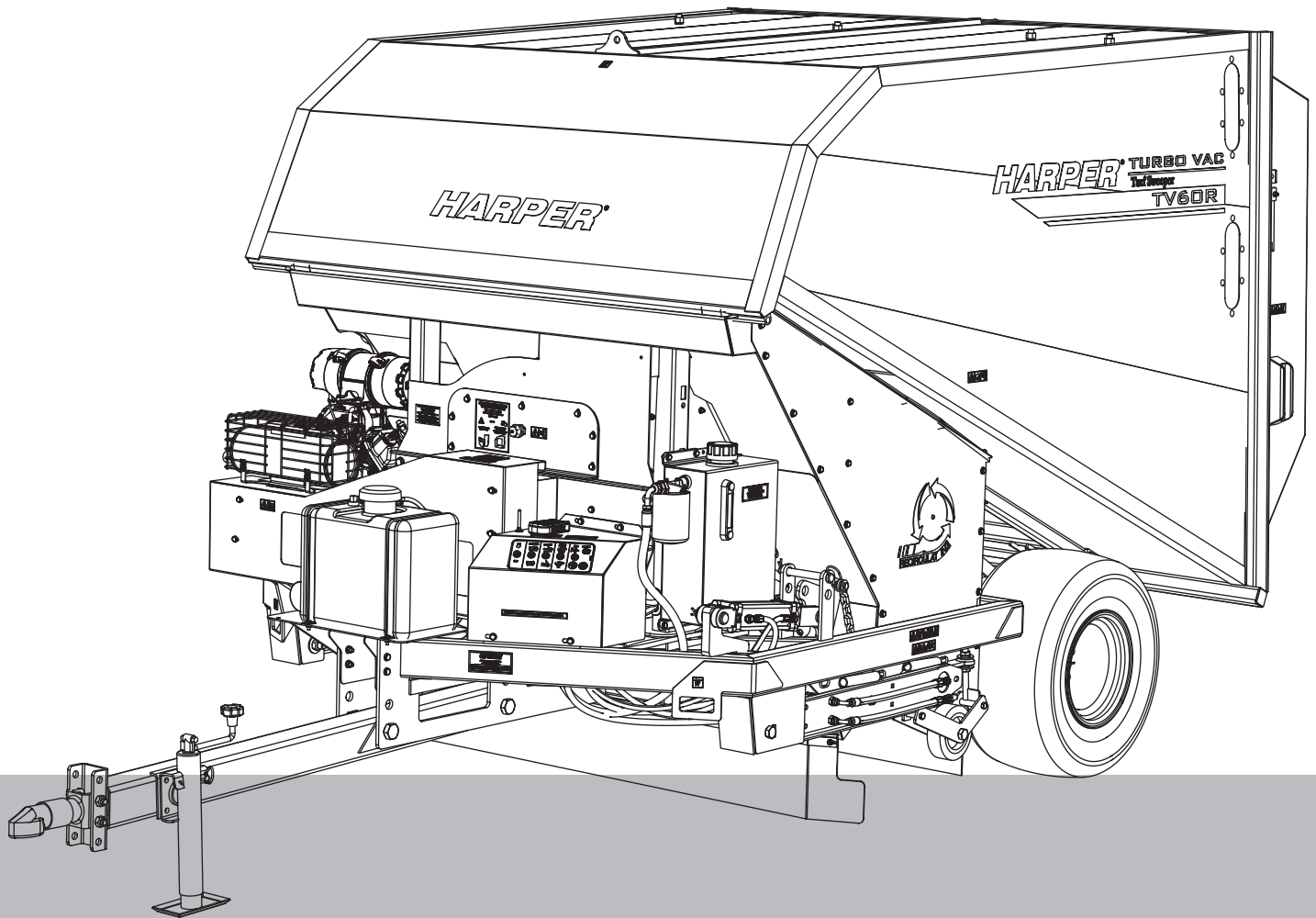


# TURBO VAC 60RE

Serial Number: 23A01+  
Part # 301025



## OPERATOR'S & PARTS MANUAL



**Thank you for purchasing a Harper Turbo Vac.**

**TO THE OWNER OR OPERATOR:**

As with all Harper products, the Harper Turbo Vac has been developed through tough design and testing procedures to produce a machine that can be relied on. This manual gives assembly, operating, and service information for models **TV60RE**. Please read and understand all instructional material included with the Turbo Vac and its components before assembling and operating the equipment.

A Turbo Vac can present hazards to an operator who follows unsafe procedures in either the operation or maintenance of the unit. Therefore, **SAFETY WARNINGS** are presented at certain locations in the text.

**SYMBOL:**



**SAFETY WARNING!**



**MEANING:** Failure to understand and obey this warning may result in injury to you or others. Whenever this symbol is used, please pay very close attention to the information presented, and make sure you fully understand. If you do not, contact your dealer or Harper Industries for clarification.



**SAFETY WARNING!**



**All shields and guards must be in place for proper and safe operation of this equipment. Where they are shown removed in this manual, it is for purposes of illustration and instruction only. Do not operate this equipment unless all shields and guards are in place.**

Harper Industries, Inc. is continually striving to improve the design and performance of its products. We reserve the right to make changes in specifications and design without thereby incurring any obligation relative to previously manufactured products.

© 2025 Harper Industries, Inc.

The Harper and Goossen names are registered trademarks of Harper Industries, Inc. All other brand and product names are trademarks or registered trademarks of their respective companies.

## LIMITED WARRANTY

Harper Industries, Inc. (HII) warrants to each purchaser of a new Harper Turbo Vac from an authorized dealer or representative, that such equipment is free of manufacturer's defects in workmanship and materials which appear while in normal service for a period of ONE YEAR commencing with delivery to the original user.

The obligation of HII under this warranty is expressly limited, at our option, to replacement or repair at a service facility designated by Harper Industries or at the manufacturing plant in Harper, KS. A part will be replaced after inspection discloses it to have been defective. This warranty does not apply to defects caused by damage or unreasonable use (including failure to provide reasonable and necessary maintenance, or by performing functions without genuine Harper Turbo Vac accessories) while in the possession of the consumer.

Warranty is limited to parts, labor and ground freight delivery of replacement parts. HII shall not be liable for the consequential damages of any kind, including but not limited to consequential labor costs or transportation charges in connection with replacement or repair of defective parts.

This warranty does not apply to parts subjected to misuse, abuse, alteration, improper or inadequate maintenance, or normal wear (including belts, battery, chains, filters, knives, brush and broom).

Engines are not covered under this warranty. Refer to manufacturer's warranty for specific warranty information. Harper Industries, its agents or representatives, make or imply no other warranties.

Harper Industries makes no warranty with respect to trade accessories. They are subject to the warranties of their respective manufacturers.

ANY IMPLIED OR STATUTORY WARRANTIES, INCLUDING ANY WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. HII makes no other express warranty, nor is anyone authorized to make any on behalf of HII.

For further information please contact your nearest Harper Turbo Vac dealer.

## EVAPORATIVE EMISSIONS CONTROL SYSTEM WARRANTY

### YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board and Harper Industries are pleased to explain the evaporative emission control system's warranty on your 2024+ Harper Turbo VAC. In California, new equipment that use small off-road engines must be designed, built, and equipped to meet the State's stringent anti-smog standards. Harper Industries must warrant the evaporative emission control system on your small Turbo VAC for the period listed below provided there has been no abuse, neglect or improper maintenance of your equipment leading to the failure of the evaporative emission control system.

Your evaporative emission control system may include parts such as: carburetors, fuel tanks, fuel lines (for liquid fuel and fuel vapors), fuel caps, valves, canisters, filters, clamps, connectors, and other associated components.

### MANUFACTURER'S WARRANTY COVERAGE:

This evaporative emission control system is warranted for two years. If any evaporative emission-related part on your equipment is defective, the part will be repaired or replaced by Harper Industries.

### OWNER'S WARRANTY RESPONSIBILITIES:

1. As the Turbo VAC owner, you are responsible for performance of the required maintenance listed in your owner's manual. Harper Industries recommends that you retain all receipts covering maintenance on your Turbo VAC, but Harper Industries cannot deny warranty coverage solely for the lack of receipts.
2. As the Turbo VAC owner, you should be aware that Harper Industries may deny you warranty coverage if your Turbo VAC or a part has failed due to abuse, neglect, or improper maintenance or unapproved modifications.
3. You are responsible for presenting your Turbo VAC to a Harper Industries dealer as soon as the problem exists. The warranty repairs shall be completed in a reasonable amount of time, not to exceed 30 days. If you have a question regarding your warranty coverage, you should contact your authorized Harper Turbo VAC dealer or Harper Industries at (620) 896-7381.



## GENERAL EVAPORATIVE EMISSIONS WARRANTY COVERGE

1. Any warranted part that is not scheduled for replacement as part of the regular maintenance program, shown in the operator's manual, provided with the mower, is warranted for the warranty period stated above. If the part fails during the period of warranty coverage, the part will be repaired or replaced by Harper Industries. Any such part repaired or replaced under the warranty will be warranted for the remainder of the period.
2. Any warranted part that is scheduled only for regular inspection in the written instructions supplied is warranted for the warranty period stated above. Instructions that state "repair or replace as necessary" will not reduce the period of warranty coverage. Any such part repaired or replaced under the warranty will be warranted for the remainder of the period.
3. Any warranted part that is scheduled for replacement as part of the regular maintenance program, shown in the operator's manual, provided with the mower, is warranted for the period of time prior to the first scheduled replacement date for that part. If the part fails before the first scheduled replacement, the part must be repaired or replaced by Harper Industries. Any such part repaired or replaced under warranty will be warranted for the remainder of the period prior to the first scheduled replacement date for the part.
4. Repair or replacement of any warranted part under the warranty provisions herein must be performed at an Authorized Harper Industries Dealer at no charge to the owner.
5. Notwithstanding the provisions of subsection (4) above, warranty service or repairs will be provided at an Authorized Harper Industries Dealer.
6. The Turbo Vac's owner will not be charged for diagnostic labor that is directly associated with diagnosis of defective, emission-related warranted part, provided that such diagnostic work is performed at an Authorized Harper Industries Dealer.
7. Harper Industries is liable for damages to other engine or equipment components proximately caused by a failure under warranty of warranted part.
8. Throughout the evaporative emission control system's warranty period stated above, Harper Turf Equipment will maintain a supply of warranted parts sufficient to meet the expected demand for such parts.
9. Only Harper Industries approved replacement parts may be used in the performance of any warranty maintenance or repairs and must be provided without charge to the owner. Such use will not reduce the warranty obligations of Harper Industries.
10. Add-on or modified parts that are not exempt by the Air Resources Board may not be used. The use of a non-exempted add-on or modified part by the purchaser will be grounds for disallowing a warranty claim. Harper Industries will not be liable to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.

### EMISSION WARRANTY PARTS LIST

The following emission warranty parts are covered: fuel tanks, fuel lines, fuel line fittings, fuel caps, carbon canisters, canister mounting brackets, carburetor purge port connections, filters\*, vapor hoses, clamps, control valves\*, control solenoids\*, electronic controls\*, vacuum control diaphragms\*, purge valves, liquid/vapor separators.

\* As they relate to the installed equipment evaporative control system.

## RECORDS

Date of Purchase \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

Serial Number Machine \_\_\_\_\_

Dealer's Name \_\_\_\_\_

Serial Number Engine \_\_\_\_\_

Dealer's Phone \_\_\_\_\_

# Supplier's declaration of conformity



This is the Australian Communications and Media Authority (ACMA) approved form for a declaration of conformity under the following legislative instruments:

- > Radiocommunications Equipment (General) Rules 2021
- > Radiocommunications Labelling (Electromagnetic Compatibility) Notice 2017.

This is a sample form for a declaration of conformity under the Telecommunications (Labelling Notice for Customer Equipment and Customer Cabling) Instrument 2015.

## Instructions for completion

**Do not return this form to the ACMA.** This completed form must be retained by the supplier as part of the documentation required for the compliance records. However, it must be made available for inspection by the ACMA when requested.

## Supplier's details (manufacturer, importer or authorised agent)

Company name (or individual)

TORO Australia Pty. Ltd
Trading as

ACN/ARBN

N1625

or

New Zealand IRDN

47 001 310 443

Street address (Australia or New Zealand)

53 Howards Rd
Beverly, S.A
POSTCODE 5009
Phone:

## Product details and date of manufacture

Product description – brand name, type, current model, lot, batch or serial number (if available), software/firmware version (if applicable)

Model No.	Product Description
914015	TV60 RE Base Machine - 26.5 HP Kohler Engine

### Compliance – applicable standards and other supporting documents

Evidence of compliance with applicable standards may be demonstrated by test reports, endorsed/accredited test reports, certification/competent body statements.

Having had regard to these documents, I am satisfied the above-mentioned product complies with the requirements of the relevant ACMA standards made under the *Radiocommunications Act 1992* and/or the *Telecommunications Act 1997*.

List these documents including details of the standard title, number and, if applicable, number of the test report/endorsed test report or certification/competent body statement.

AS/NZS CISPR 12:2007


### Declaration

I hereby declare that:

1. I am authorised to make this declaration on behalf of the Company mentioned above
2. the contents of this form are true and correct
3. the product mentioned above complies with the applicable above mentioned standards and all products supplied under this declaration will be identical to the product identified above
4. I understand that giving false or misleading information is a serious offence.

**Note:** It is an offence to knowingly provide false or misleading information to a Commonwealth entity or a person who is exercising powers, performing functions under, or in connection with, a law of the Commonwealth. It is an offence to knowingly provide false or misleading information or documents in compliance or purported compliance with a law of the Commonwealth. (See sections 137.1 and 137.2 of the *Criminal Code Act 1995*.)

Penalty: 12 months imprisonment

 SIGNATURE OF SUPPLIER OR AGENT	POSITION IN ORGANISATION VP of Engineering
PRINT NAME Joe Biggerstaff	DATE 10-3-2025

The *Privacy Act 1988* (Cth) (the Privacy Act) imposes obligations on the ACMA in relation to the collection, security, quality, access, use and disclosure of personal information. These obligations are detailed in the Australian Privacy Principles.

The ACMA may only collect personal information if it is reasonably necessary for, or directly related to, one or more of the ACMA's functions or activities.

The purpose of collecting the personal information in this form is to ensure the supplier is identified in the 'declaration of conformity'. If this declaration of conformity is not completed and the requested information is not provided, a compliance label cannot be applied.

Further information on the Privacy Act and the ACMA's privacy policy is available at [www.acma.gov.au/privacypolicy](http://www.acma.gov.au/privacypolicy). The privacy policy contains details about how you may access personal information about you that is held by the ACMA, and seek the correction of such information. It also explains how you may complain about a breach of the Privacy Act and how we will deal with such a complaint.

Should you have any questions in this regard, please contact the ACMA's privacy contact officer on telephone on 1800 226 667 or by email at [privacy@acma.gov.au](mailto:privacy@acma.gov.au).

**MANUFACTURER'S NOTICE OF COMPLIANCE****AUSTRALIA WORK AND SAFETY ACT AND REGULATIONS OF 2011**

The turf machine identified below was designed and manufactured by Harper Industries, Inc. headquartered in Harper Kansas, USA.

**Hazard identification, Risk Assessment and Risk Reduction:** Harper Industries has undertaken a hazard identification, risk assessment and risk reduction procedure on a sample of the product and model identified below. The procedure undertaken followed the principles identified in the Australian safety standard AS/NZS 4024.1201 – Safety of *machinery – General principles for design – Risk assessment and risk reduction*. The procedure followed meets the requirements specified in the Occupational Work and Safety Regulations 2011 as amended for the design and manufacture of plant. The machine has been designed and manufactured to comply with the relevant and applicable industry safety standards. Appropriate hazard elimination or control measures have been incorporated into the product design and specifications.

**Health and Safety Information:** An operator's manual, which includes instructions on the safe use of the machine, is provided with each machine. Product warning signs are affixed to the product where necessary.

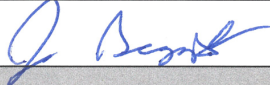
**Operator Noise Exposure:** The sound level at the operator's station of ride-on equipment has been measured on a representative sample of a machine in accordance with ISO 5131, Annex B or equivalent standard. The sound level depends upon the machine operating conditions such as engine and travel speed, as well as the condition and maintenance of the machine.

**Operator Station Sound Level:** 83 d(B)A

<b>Product Description</b>	Pull Type Turbo Vac
----------------------------	---------------------

<b>Model Number(s)</b>	Tv60RE - 914015
------------------------	-----------------

<b>Manufacturing Unit</b>	Harper Industries Inc., Harper, Kansas, USA
---------------------------	---------------------------------------------

<b>Authorized Representative Signature</b>	
--------------------------------------------	-------------------------------------------------------------------------------------

<b>Name</b>	Joe Biggerstaff, VP Engineering
-------------	---------------------------------

<b>Date</b>	10/3/2025
-------------	-----------

151 E. US Hwy 160  
Harper, Kansas 67058, USA  
[www.harperindustries.com](http://www.harperindustries.com)

☎ 620.896.7381

📠 620.896.7129

☎ 800.835.1042

✉ [info@harperindustries.com](mailto:info@harperindustries.com)



**MANUFACTURER'S NOTICE OF COMPLIANCE  
NEW ZEALAND HEALTH AND SAFETY at WORK (GENERAL RISK AND  
WORKPLACE MANAGEMENT) REGULATIONS OF 2011**


The turf machine identified below was designed and manufactured by Harper Industries, Inc. headquartered in Harper Kansas, USA.

**Hazard identification, Risk Assessment and Risk Reduction:** Harper Industries has undertaken a hazard identification, risk assessment and risk reduction procedure on a sample of the product and model identified below. The procedure undertaken followed the principles identified in the Australian safety standard AS/NZS 4024.1201 – Safety of *machinery – General principles for design – Risk assessment and risk reduction*. The procedure followed meets the requirements specified in the Health and Safety at Work Regulations 2016 as amended for the design and manufacture of plant. The machine has been designed and manufactured to comply with the relevant and applicable industry safety standards. Appropriate hazard elimination or control measures have been incorporated into the product design and specifications.

**Health and Safety Information:** An operator's manual, which includes instructions on the safe use of the machine, is provided with each machine. Product warning signs are affixed to the product where necessary.

**Operator Noise Exposure:** The sound level at the operator's station of ride-on equipment has been measured on a representative sample of a machine in accordance with ISO 5131, Annex B or equivalent standard. The sound level depends upon the machine operating conditions such as engine and travel speed, as well as the condition and maintenance of the machine.

**Operator Station Sound Level:** 83 d(B)A

<b>Product Description</b>	Pull Type Turbo Vac
<b>Model Number(s)</b>	TV60RE - 914015
<b>Manufacturing Unit</b>	Harper Industries Inc., Harper, Kansas, USA
<b>Authorized Representative Signature</b>	
<b>Name</b>	Joe Biggerstaff, VP Engineering
<b>Date</b>	11/4/2025

151 E. US Hwy 160  
Harper, Kansas 67058, USA  
[www.harperindustries.com](http://www.harperindustries.com)

☎ 620.896.7381  
☎ 620.896.7129  
☎ 800.835.1042  
✉ [info@harperindustries.com](mailto:info@harperindustries.com)

# **///HARPER<sup>®</sup>INDUSTRIES, INC.**

## **EC Declaration of Conformity according to the EC Machinery Directive 2006/42/EC, Annex II 1.A**

### **Manufacturer:**

Harper Industries Inc.  
151 E US Highway 160  
Harper, Kansas, USA, 67058  
Phone: +1 (620) 896-7381

### **Person established in the Community, who is authorized to compile the technical file:**

ProDoku  
Hartmut Hartmann, Dipl.-Ing. (FH)  
Wersener Holz 2a  
D-49504 Lotte  
Phone: +49 (0) 5404 / 5637  
Mobil: +49 (0) 176 / 10590693  
Email: Hartmut.Hartmann@prodoku.com

### **Description and identification of the machinery:**

<b>Machine Type:</b>	<b>Turf Vacuum Sweeper</b>
<b>Model(s):</b>	<b>TV60RE</b>
<b>Serial Number:</b>	<b>NNNNNNNN</b>
<b>Measured Sound Pressure Level:</b>	<b>83dBa</b>

**It is expressly declared, that the machinery fulfills with all the relevant provisions of the following EC directives:**

Directive 2006/42/EG	Directive on machinery Published in the Official Journal of the European Union, L 157/41 of 9.6.2006
Directive 2000/14/EC	Directive on noise emission in the environment by equipment for use outdoors Published in the Official Journal of the European Union, L 162 of 3.7.2000
Directive 2005/88/EC	Amending Directive 2000/14/EC Published in the Official Journal of the European Union, L 344/44 of 27.12.2005

**Place of the declaration:** Harper, Kansas, USA

**Date of the declaration:** 3 October 2025

**Signature:**

  
Joe Biggerstaff

**Title:**

Vice President, Engineering

# Table of Contents

## OPERATOR SECTION

To the Owner or Operator.....	1
Warranty Statement.....	2-3
Declaration of Conformity AU & NZ/.....	4-7
Declaration of Conformity EC.....	8
Table of Contents.....	9
Specifications.....	10

## Feature Identification

TV60RE.....	11-12
-------------	-------

## General Safety Guidelines

Equipment & Controls.....	13
Guards & Shields.....	13
Before Operation.....	13
During Operation.....	13
During Service & Maintenance.....	14
Safety Decals.....	15-17
Replacement Parts.....	18
Gasoline.....	18
Hydraulics.....	18

## Specific Safety Guidelines

TV60RE.....	19
-------------	----

## Set-up and Operation

TV60RE.....	19
Starting Operation.....	20
Stopping Operation.....	20
Unloading Hopper.....	20
Towing.....	21

## Adjustments

Level Hook-Up.....	22
Broom Height.....	22
TV60RE Blower Drive Belt.....	23
TV60RE Hydraulic Pump Belt.....	23
Remote and Receiver.....	24-26

## Service & Maintenance

Break-in Service.....	27
Lubrication.....	27
TV60RE Hydraulic System.....	28
Blower Liner.....	28
Electrical Wiring.....	28
Return Air Screens.....	29
Jack Lift Points.....	29
TV60RE Service Schedule.....	30
Torque Chart & Optional Equipment.....	31
Troubleshooting.....	32

## PARTS SECTION

### Frame

Frame Assembly.....	35-36
Wheel Assembly.....	37
Deck Arm Assembly.....	38
Attaching Deck Arms.....	39

### Blower Installation

Fan Assembly.....	41
Fan Shaft Assembly.....	42
Fan Housing Assembly.....	43
Blower Housing Installation.....	44
Fan Housing Installation.....	45
Air Return.....	46
Seal & Trim Installation.....	47

### Hopper and Door Assemblies

Sight Window Installation.....	49
Screen Installation.....	50
Hopper w Decals.....	51
Lift Lock Installation.....	53
Door Latch Installation.....	54
Door Installation.....	55
Door Assembly.....	56

### Hydraulics Installation

Hydraulic Pump Assembly.....	58
Hydraulic Reservoir.....	59
Broom Hydraulic Assembly.....	60
Hopper Lift & Door Latch Hydraulics.....	61-62
Valve Assembly.....	63
Hydraulic Schematic.....	64

### Engine Installation

Engine Assembly.....	65
Electric Clutch Kit.....	67
Engine Installation.....	68
Engine Fuel, Emissions & Electrical.....	69
Engine Service Parts.....	70

### Electronics Installation

Electronics Installation.....	71
Control Panel Assembly.....	72
Wiring Schematic (Kar-Tech Remote).....	73
Engine Harness Schematic.....	74

### Decals and Final Installation

Export Kit.....	75
Final Installation.....	76
Decal Installation (Left).....	77
Decal Installation (Right).....	78
Decal Installation (General).....	79

### Options

Broom Kit.....	80
Broom Assembly.....	81
Finger Rotor Kit.....	82
Finger Rotor Assembly.....	83
Fence Brush Option.....	84-85
Edge Brush Instructions.....	86

## Specifications

<b>Noise Levels</b>	• 83dBa
<b>Safety Features</b>	• Locking safety latches on all cylinders for service functions – Engine automatically returns to idle while dumping
<b>Power</b>	†Kohler gasoline engine
<b>Hydraulic System</b>	Belt-driven pump powers broom and cylinders
<b>Hydraulic Reservoir</b>	5 gallons, Crown AW46
<b>Blower Drive</b>	Dual Powerband belt drive w/ electric clutch
<b>Blower Fan</b>	25" diameter fan of abrasion-resistant steel
<b>Housing Liner</b>	• 1½" shaft with self-aligned bearings supporting both ends • Easy access to housing liner* for inspection and replacement *UHMW poly-liner - Ultra High Molecular Weight Polyethylene
<b>Broom Drive</b>	Hydraulic motor – direct drive
<b>Broom</b>	17" diameter X 60" wide pick-up broom with heavy-duty polyethylene bristles and adjustable gauge wheels
<b>Bearings</b>	Greasable bearings and sealed bearings
<b>Hopper</b>	7 yard capacity
<b>Wheels/Tires</b>	6-bolt steel wheels • Turf Tires – 26 x 12 (standard) • Radial Tires – 225 X 60R15 steel belted (available as an option)
<b>Controls</b>	Wireless RF (radio frequency) remote controls
<b>Discharge</b>	Hydraulic dump with automatic latch mechanism
<b>Hitch</b>	Adjustable height tongue with ball hitch
<b>Paint</b>	Durable 2-part polyurethane
<b>Dimensions</b>	164" long X 85" wide X 85" high
<b>Weight</b>	2300 lbs – 1046 kg
<b>Hitch Weight</b>	675 lbs – 306 kg
<b>Fuel</b>	6 gallon capacity - Gasoline

- Denotes common characteristics of both the **TV60RE** and **TV60RH**

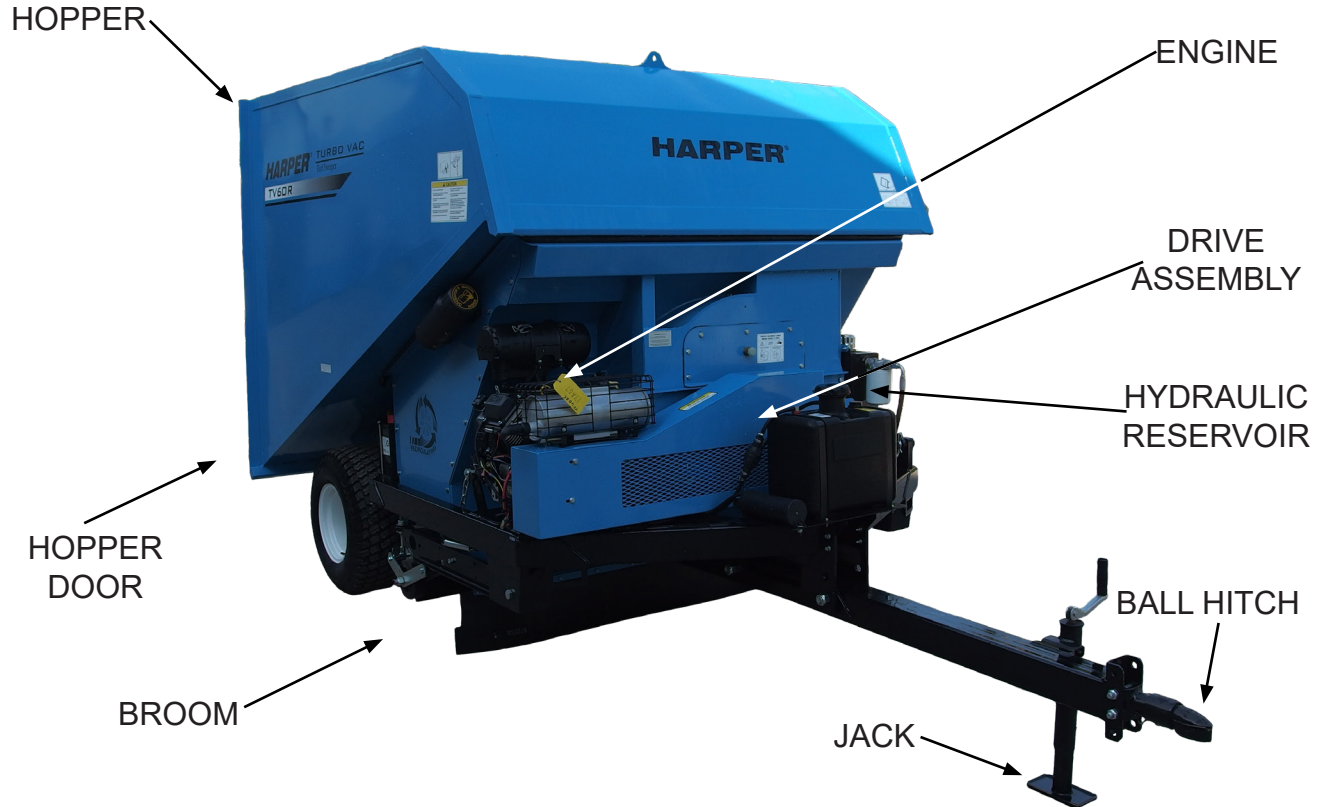
† Kohler 23.5 HP (PA-ECH730-3092) used on: 22A15 & earlier, 22A36 & 22A99, 23A06 & 23A99, 24A11 & 24A38  
 26.5 HP (ECH749-3059) used on: 22A16-22A35, 23A01-23A05  
 26.5 HP (ECH749-3138) CARB used on: 24A01 & 24A10, 24A39+

**NOTE:** Following publication of this manual certain changes in standard equipment and/or options may have occurred that would not be included in these pages. Your Harper/Goossen dealer is the best source for up-to-date information.



## Feature Identification

## Model TV60RE



**Hopper\*** – The hopper stores up to seven yards of collected material.

**Hopper Door\*** – The hopper door opens when the door latches are opened.

**Engine** – A 23.5 HP Kohler EFI engine powers the drive assembly.

**Drive Assembly** – The drive assembly powers the hydraulic pump and blower.

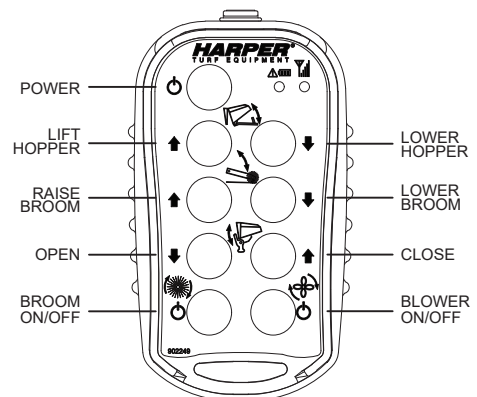
**Hydraulic Reservoir** – The hydraulic reservoir on a **TV60RE** has a 5 gallon capacity.

**Broom\*** – The broom rotates to rake up the material from the turf.

**Jack\*** – The jack supports the front of the Turbo Vac when it is not attached to a tow vehicle. During operation, the jack must be up, with the wheel removed and in the stow location.

**Ball Hitch\*** – The TV60R is towed with a ball hitch. Unit is not approved highway towing.

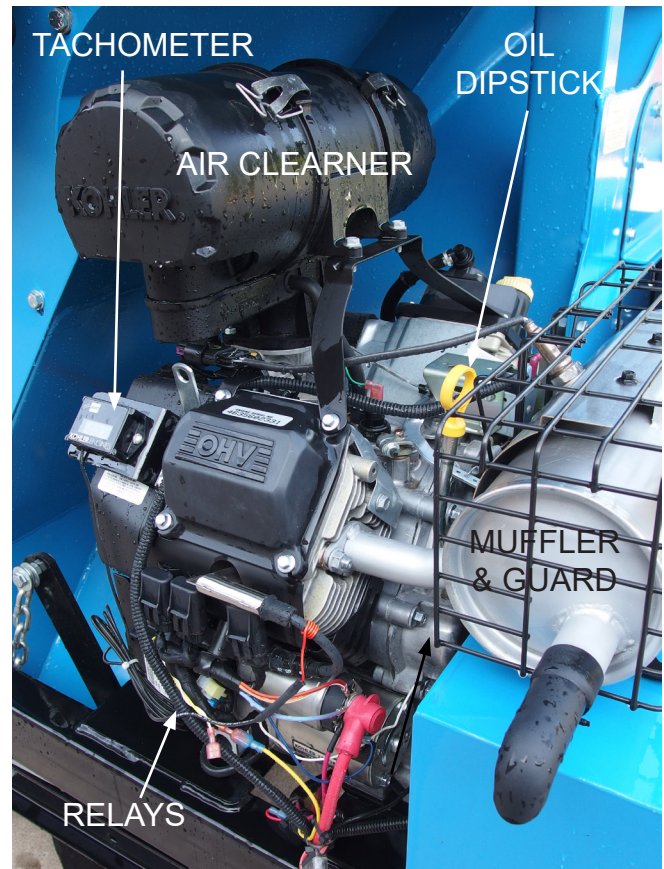
**Remote Controls\*** – A wireless transmitter allows functions of the Turbo Vac to be controlled from the tow vehicle. The old style remote transmitter used two AA batteries, the new version is rechargeable. The two systems are not interchangeable/compatible.



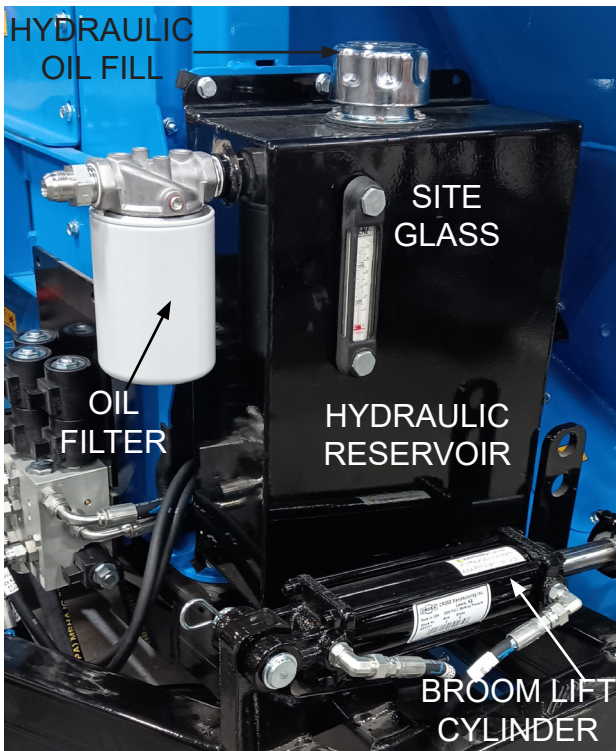
\* Denotes common features of both the **TV60RE** and **TV60RH**.

See **Adjustments** section for information on the sleep function with the remote and transmitter.

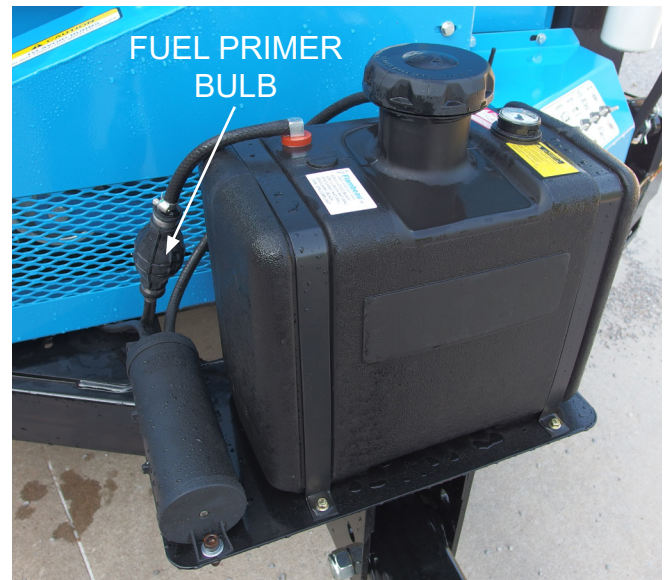
## TV60RE - 23.5 HP Kohler Engine



## TV60RE - Hydraulic System & Fill Locations



Hydraulic Reservoir Assembly



Fuel Tank



# General Safety Guidelines

## Equipment & Controls

- Before operating this equipment, read and understand the Owner's Manual.
- Altering the unit in any way that adversely affects its safe operation, performance or durability will void the warranty and may cause hazardous conditions.
- Know the location and function of all controls and how to stop the equipment quickly in an emergency before you operate the Turbo Vac.
- Keep all nuts, bolts and screws tight to ensure safe operation of equipment.

## Guards & Shields

- Keep all safety devices in place and in good operating condition.
- Replace all worn, damaged, unusable, missing or lost safety shields and guard before operating unit.

## Before Operation

- Do not allow children near this machine.
- Make sure bolts in tongue are secure and jack is in the transport position.
- Ensure tires are inflated to air pressure listed on side of tire.
- Engine governor settings are preset and should not be changed; any change can damage moving parts and void warranty.
- Before starting the machine, visually inspect all nuts, bolts and other fasteners to see that they are properly secured.
- Nuts, bolts and other fasteners should be checked after the first hour of operation and every 8 to 10 hours thereafter for proper alignment and tightness.
- Make sure that all belts are in good condition, and replace if necessary.



## **SAFETY WARNING!**



**Not for use on public roadways.**

## During Operation

- While operating the equipment, make sure that no foreign objects such as rocks, bottles or other hard materials are in the path of the Turbo Vac.
- If an object should strike the broom or blower mechanism causing an unusual noise or vibration, shut the engine off immediately and allow it to come to a complete stop. Disconnect the spark plug wire from the spark plug of the power unit, and do the following:
  1. Inspect for damage.
  2. Repair or replace damaged parts.
  3. Check for and tighten any loose bolts, nuts, fasteners or parts.
- Keep the engine area clean and free of debris and other accumulations.
- If the Turbo Vac should become clogged, shut off the engine and allow it to come to a complete stop. Disconnect the spark plug wire from the spark plug of the power unit before attempting to remove the clog.
- After use, use provided wheel chocks for parking.



## **SAFETY WARNING!**



**Always keep a fire extinguisher near the Turbo Vac during operation and service.**



## **SAFETY WARNING!**



**To prevent possible eye injury, always wear SAFETY GLASSES while operating or servicing the equipment.**



## **SAFETY WARNING!**



**Noise levels are noted but depend upon machine towing unit. Use appropriate hearing protection.**

**! SAFETY WARNING! !**

When working under the hopper the cylinder safety lock should be engaged to prevent the hopper from falling.

**During Service & Maintenance**



- To engage the cylinder safety lock, take the pin out of the bracket on the hopper and pull the handle down.



- The cylinder safety lock prevents the hopper from being lowered so that maintenance can be performed safely.
- When finished working under the hopper, disengage the safety lock, put the handle back into the bracket on the hopper and replace the pin.

**! SAFETY WARNING! !**

Attempting to lower the hopper while the cylinder safety lock is engaged may cause damage to the cylinder and/or the safety lock mechanism.

**! SAFETY WARNING! !**

If it is necessary to get between the hopper and the hopper door, set the door prop to avoid being pinched.

- To set the door prop, pull the door open and insert prop into pre-cut hole in door.



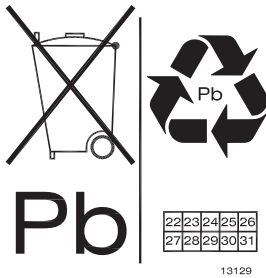
## Safety Decals

- If safety related or instructional decals become illegible or are removed, replace them immediately.
- If parts are replaced, make sure all safety related or instructional decals are present before the equipment is operated again.
- New decals may be obtained from your local Harper dealer.

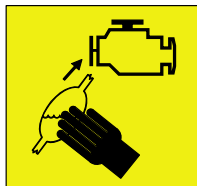
## Safety Symbols

**WARNING:** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

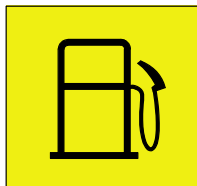
### 1. P65 Warning



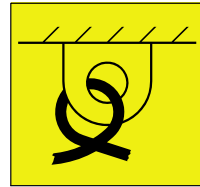
### 2. Recycle the battery



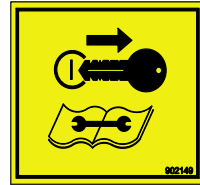
### 3. Engine prime bulb



### 4. Fuel Tank



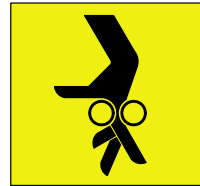
### 5. Tie down point



### 6. Read manual before starting/operation



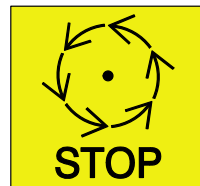
### 7. Safety alert



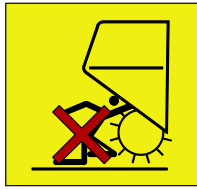
### 8. Hand can be entangled in moving parts



### 9. Contacting moving parts will cause injury



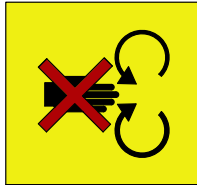
### 10. Shut off equipment before servicing



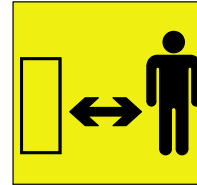
11. Don't enter machine while it's running



17. High pressure spray can erode flesh



12. Don't remove safety shields during operation



18. Stay safe distance from machine in use



13. Hopper can come down on operator



19. Don't enter while door is loose



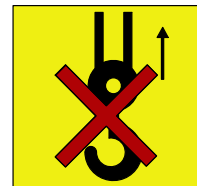
14. Hot surface can burn fingers or hands



20. Don't stand behind machine



15. Shut off equipment before servicing



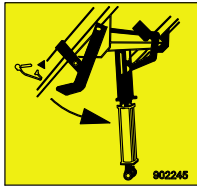
21. Don't use for lifting machine



16. High pressure fluid skin injection danger



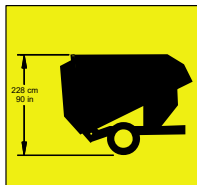
22. Never tip machine on slope or soft ground



23. Install cylinder safety lock before servicing



24. Insert prop rod



25. Machine height



26. Machine height with raised hopper



27. Crush hazard behind swinging door



28. Pinch hazard entering with swinging door

## Replacement Parts



### **SAFETY WARNING!**

**Use genuine factory parts or parts with equivalent characteristics including: type, strength and material. Failure to do so may result in voidance of warranty, product malfunction or possible injury to operator and others.**

- Replace locknuts and locking screws if they can be tightened without considerable resistance for several turns before they are completely tight.
- If hardware is not secure, or if some of the fasteners are over-tightened, equipment failure may result, posing possible safety hazards.
- Use proper torque specifications for all fasteners when they are replaced.

## Gasoline



### **SAFETY WARNING!**

**Gasoline is extremely flammable and can be highly explosive.**

- Always use an approved container for gasoline.
- Do not allow open flames or sparks while performing maintenance or refueling.
- Never remove the fuel tank cap or add gasoline when the engine is running or while it is hot.
- Never fill the fuel tank indoors. Gasoline fumes are heavy and will sink to the lowest point, collecting and becoming increasingly hazardous. One part gasoline in 20 parts air will explode easily and violently.
- Wipe up spilled gasoline immediately.
- Do not store gasoline in a room with an appliance that has a gas pilot or electrical switch that may cause sparks.

- Always store gasoline outside in a safety can (a can that has a flame arrester and pressure relief valve in pour spout).
- Never store the equipment with gasoline in the tank inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing in any enclosure.
- Be certain to provide adequate ventilation if an engine must be run indoors exhaust fumes are dangerous.

## Hydraulics



### **SAFETY WARNING!**

**High pressure fluid. Escaping fluid under pressure can penetrate skin and cause serious injury or death.**

#### **To prevent serious injury or death:**

- Relieve pressure on system before repairing, adjusting or disconnecting.
- Wear proper hand and eye protection when searching for leaks.
- Use wood or cardboard instead of hands when looking for leaks.
- Keep all hoses, fittings and components in good repair.
- Do not use any type of heat or flame (welding, soldering, cutting torch, etc.) near pressurized hydraulic lines.



## Specific Safety Guidelines

### TV60RE

- Be sure to provide adequate ventilation if the engine must be run indoors exhaust fumes are very dangerous.
- The Turbo Vac hydraulic system operates under high pressure. Be sure the hydraulic system is disabled prior to service.
- Periodically clean area around engine to lessen the possibility of fire.
- The engine governor should not be adjusted; any change can damage moving parts and void warranty.
- Keep clothing and all body parts away from rotating parts.



### **SAFETY WARNING!**

**Gasoline is extremely flammable and can be highly explosive.**

- Always use an approved container for gasoline.
- Do not allow open flames or sparks while performing maintenance or refueling.
- Never remove the fuel tank cap or add gasoline while the engine is running or hot.
- Refer to the engine manual for additional information on gasoline.



### **SAFETY WARNING!**

**The battery on Turbo Vacs with electric start can produce explosive gasses.**

- Ventilate when charging battery or using in an enclosed space.
- DO NOT produce sparks from cable clamps, tools, or other sources.
- DO NOT allow flames or smoking in the vicinity of the battery.
- Shield eyes when working near battery.

## Set-Up and Operation



### **SAFETY WARNING!**



**Wear approved eye protection and safety gear during set-up and operation of the Turbo Vac.**

### TV60RE

1. Fill the tank with gasoline. (Refer to engine manual for gasoline specifics.)
2. Attach the unit to the tow vehicle. Be sure that the Turbo Vac is level with the ground. (Refer to the Adjustments section for information on leveling.)
4. Pull choke and turn key to start position and release as soon as the engine starts. **DO NOT TURN THE STARTER OVER FOR MORE THAN 10 SECONDS.**
5. Once the engine is running, gradually move the choke lever to the off position, and allow the engine to warm up. (When restarting a warm engine, it should not be necessary to use the choke lever.)



### **SAFETY WARNING!**



**Never remove the fuel tank cap or add gasoline when the engine is running or while it is hot.**

6. The engine will automatically throttle up to operating speed when the blower and broom are engaged.



### **SAFETY WARNING!**



**Periodically clean material away from engine to lessen the possibility of fire.**

## Starting Operation

Before operating the Turbo Vac, perform the daily inspection as described in the Service & Maintenance section. The operator should be familiar with the area to be swept and make sure it is clear of large debris.

1. Push the switches on the remote control or move the manual switches to activate the functions on the Turbo Vac.
2. Engage the tow vehicle and advance slowly at first to test environmental conditions and machine performance.
3. Proceed with caution, steering clear of obstacles that could damage broom.

Check overhead clearance during use.

Clearance is:       7' 6" for sweeping  
                  8' 6" for dumping



### **SAFETY WARNING!**

**Wear approved eye and ear protection while operating the Turbo Vac.**

**Keep all guards in place during operation. Never operate the Turbo Vac with safety shields removed.**

**Always keep a fire extinguisher near the Turbo Vac during operation.**

## Stopping Operation

1. Push the BLOWER and BROOM switches on the remote control to turn off the **TV60RE** functions.
2. Shut off the engine and allow the machine to come to a complete stop.



### **SAFETY WARNING!**

**Do not leave the Turbo Vac unattended, or attempt any service or inspection unless the machine has come to a complete stop, the engine has been shut off, and the spark plug has been disconnected.**

## Unloading Hopper

1. Check the overhead clearance. 8' 6" is required for dumping.
2. To unload, press the OPEN LATCH and LIFT HOPPER buttons on the remote.
3. When unload is complete, press the LOWER HOPPER button. Once the hopper has lowered completely, press the CLOSE LATCH button.



### **SAFETY WARNING!**

**Do not stand near the back of the Turbo Vac while unloading.**

**If there is grass stuck in the hopper, do not go in between the hopper and the door without setting the safety lock.**

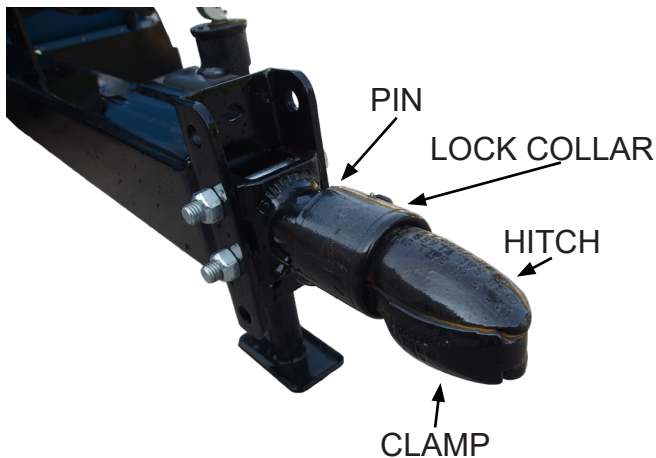
## Towing



### **SAFETY WARNING!**

The Turbo Vac does not meet highway safety codes. Tail lights, turn signals and safety chains must be attached before towing on public roadways.

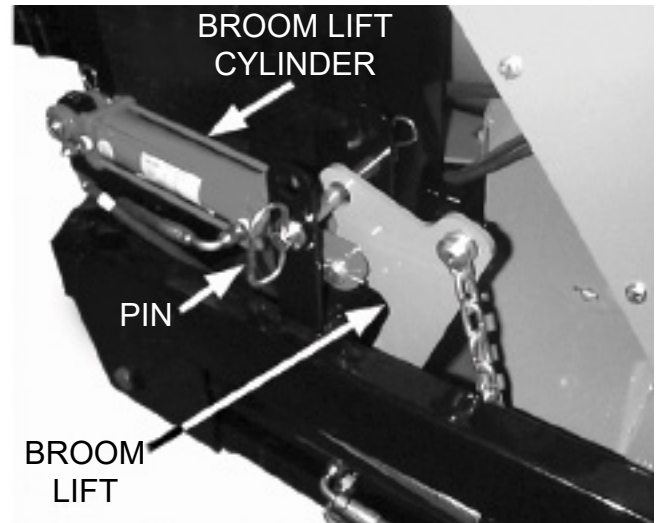
- Close the clamp around the ball and secure with the lock collar. Insert the pin to keep the lock collar in place.



- The jack should be up whenever the Turbo Vac is connected to a tow vehicle.



- Always use the safety pin to lock the broom lift when towing the unit.

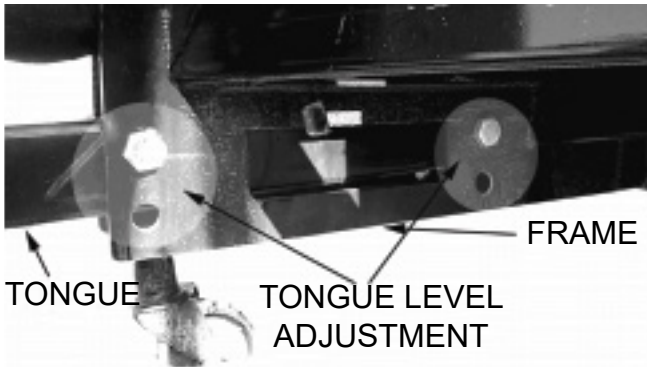


- Tires should be aired up to the proper tire pressure listed on the side of tire.
- Make sure the wheel lug nuts are tight.

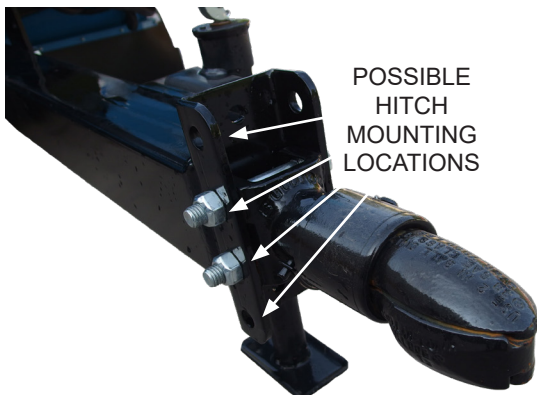
## Adjustments

### Level Hook-Up

- For the Turbo Vac to work properly, the frame needs to be level with the ground.
- The tongue can be moved up or down depending on which set of holes on the frame are used.



- The hitches on different tow vehicles vary in height, so there are adjustments on the hitch and the tongue to keep the Turbo Vac level.



### Broom Height

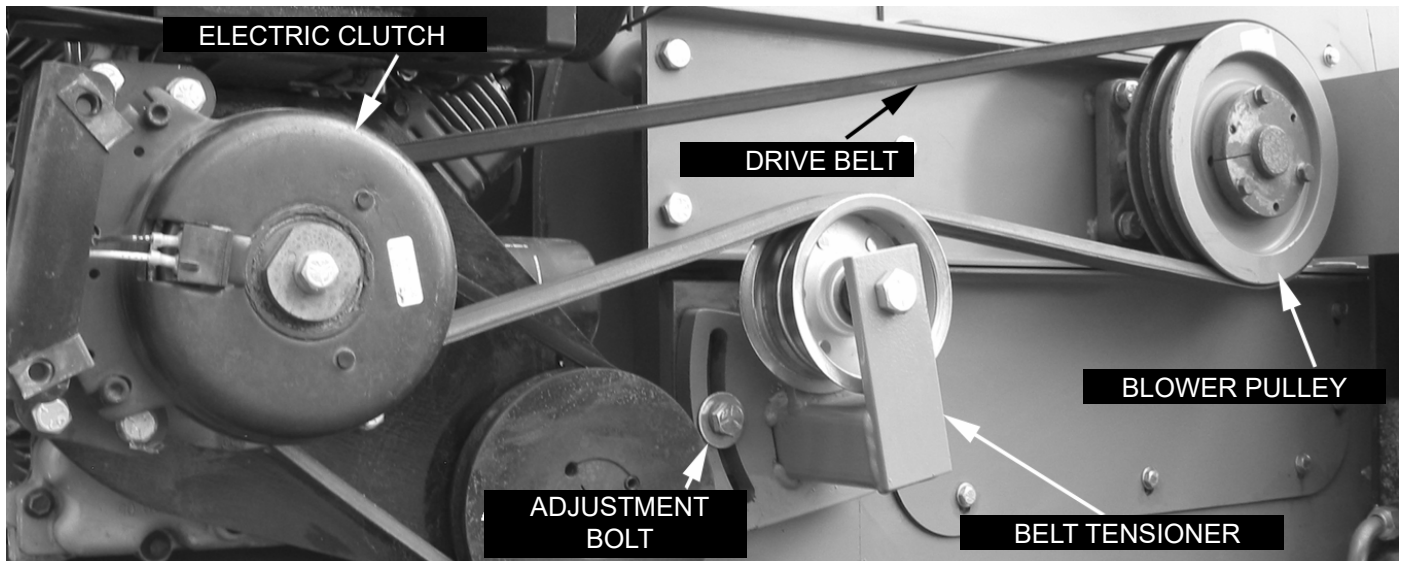
- The broom height should be adjusted so that the broom barely touches the grass.



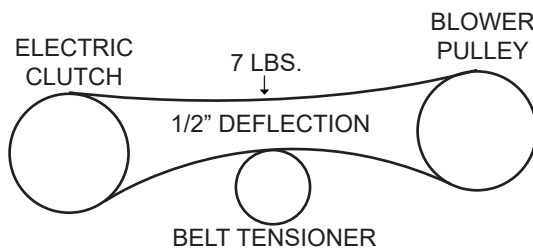
- Broom height is easily adjusted tightening or loosening the nuts on the broom height adjustment.
- Make sure that both broom wheels (one per side of unit) are adjusted the same so the broom stays level.
- Brooms are originally 17" in diameter.
- When the broom wears down to 15" the adjustment will not lower the broom enough for it to perform adequately and the broom needs to be replaced.



## TV60RE Blower Drive Belt

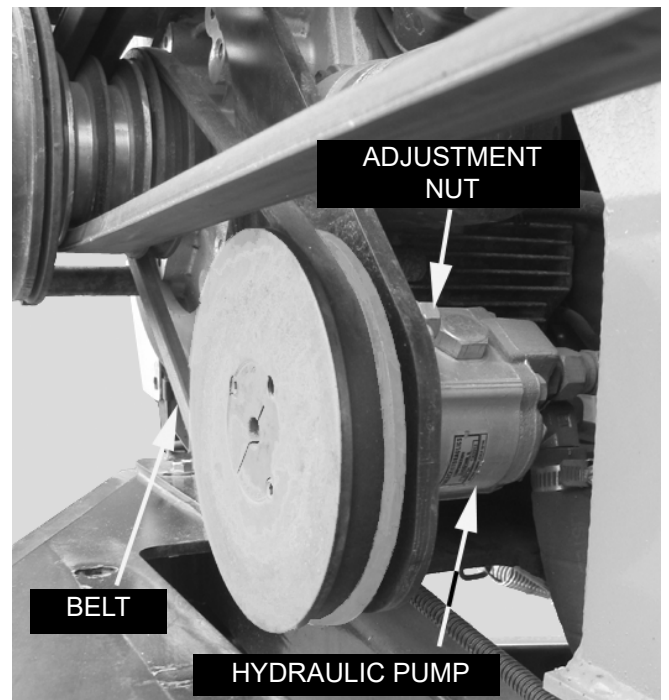


- To adjust belt tension, loosen the adjustment bolt and the bolt where the tensioner pivots. Position the tensioner to allow for proper deflection. Retighten both bolts.



- Apply 7 lbs. of pressure to the midpoint between the electric clutch and blower pulley. The belt should deflect  $\frac{1}{2}$  in.
- Too much tension (minimal deflection) can damage the belt and bearings. Too little tension (excessive deflection) will allow belt to slip and decrease blower performance.
- To replace the drive belt, loosen the belt tensioner and remove the old belt. Install the new belt, and follow the same procedure for adjusting tension as described previously.
- Inspect the belts frequently and maintain the correct tension and alignment.

## TV60RE Hydraulic Pump Belt



- To adjust the belt tension on the hydraulic pump, loosen the adjustment nut and the nut where the pump pivots.
- Position the pump to allow  $\frac{1}{8}$  in. deflection at the mid-point when 6 lbs. applied. Re-tighten both nuts.
- If a belt shows signs of wear, such as fraying, cracking or missing pieces; replace it immediately.

# Remote and Receiver

## Operation

- Turn on the transmitter, press and hold the POWER button for at least 2 seconds and release.
- To turn the transmitter off, press and hold the POWER button until the LEDs stop blinking.
- The transmitter is designed with a power saving feature which turns the transmitter off after 15 minutes irrespective of receiver status.
- Transmitter and receiver have red and green LEDs. The green LED will double blink when no buttons are pressed, blink rapidly when a synched button is pressed, and will blink slowly if there is no communication (i.e. - no power to the receiver) when a button is pressed.
- The red LED on the receiver will blink if there is a shorted or open output.
- The transmitter's red LED blinks 1 time per second if the battery is low and needs charging.
- If transmitter is powered off or goes out of range, outputs will turn off and be disabled until power on and in range.

## Synchronizing Transmitter and Receiver

Each transmitter and receiver pair is synchronized together at the factory. If a new transmitter is needed, synchronizing is required. Use the following procedure:

1. Make sure transmitter and receiver are off.
2. With the transmitter off, press and hold the POWER button for more than 10 seconds. LEDs start blinking.
4. Turn on the receiver.
5. Wait several seconds until only the green LED on the transmitter blinks.
6. Teach complete.

## Sleep Time

All transmitters have the ability to change the sleep time from the default to user's preference. The transmitter is factory set to turn off (sleep) after 15 minutes irrespective of receiver status. To change the time the transmitter waits before going to sleep, use the following procedure:

1. With the transmitter off, press and hold buttons RAISE BROOM, LOWER BROOM, BROOM ON/OFF, & POWER (~ 5 seconds)
2. At this point, both lights will blink once per second. Release the buttons.
3. On the transmitter, press one of the following buttons to adjust the sleep time:
  - LIFT HOP = 15 minutes
  - LOWER HOP = 30 minutes
  - RAISE BROOM = 60 minutes
  - LOWER BROOM = 120 minutes
  - BROOM ON/OFF = DISABLED
4. Sleep time programing complete.

## Cloning Transmitters



### SAFETY WARNING



**Only one transmitter can be on at a time, they cannot be used simultaneously. Use caution.**

Occasionally, it is desired to have more than one transmitter work with a single receiver. This is accomplished by a process called cloning. Cloning allows an additional transmitter (B) to have the same ID code as the original transmitter (A). If this feature is desired, use the following procedure:

1. Make sure both transmitters and the receiver are off.
2. On Transmitter A, press and hold the POWER button for 10 seconds until LEDs blink, then release. Green and red LEDs will blink together at this point.
3. On Transmitter B, press and hold buttons LIFT HOP, LOWER HOP, and POWER simultaneously until both LEDs blink.

4. Wait for a few seconds until the green LED starts to blink on both transmitter A and transmitter B.
5. Turn both the transmitters off.
6. Synchronize one of the transmitters to the receiver using SYNCHRONIZING TRANSMITTER AND RECEIVER instructions.

If the cloning feature has been invoked and is no longer desired, the ID code of one of the transmitters needs to be changed. This will unclone the transmitters. If this is desired, use the following procedure:

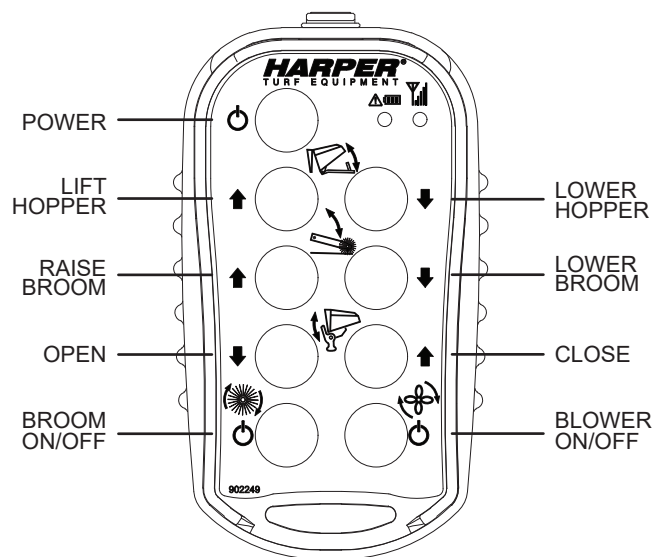
- Make sure the transmitter is off.
- Press and hold hold LOWER HOP, RAISE BROOM, BLOWER ON/OFF and POWER buttons for 5 seconds.
- Release all the buttons when GREEN and RED LEDs start toggling.
- Press any button and release. GREEN LED should start to double-blink.
- ID change Sequence complete.

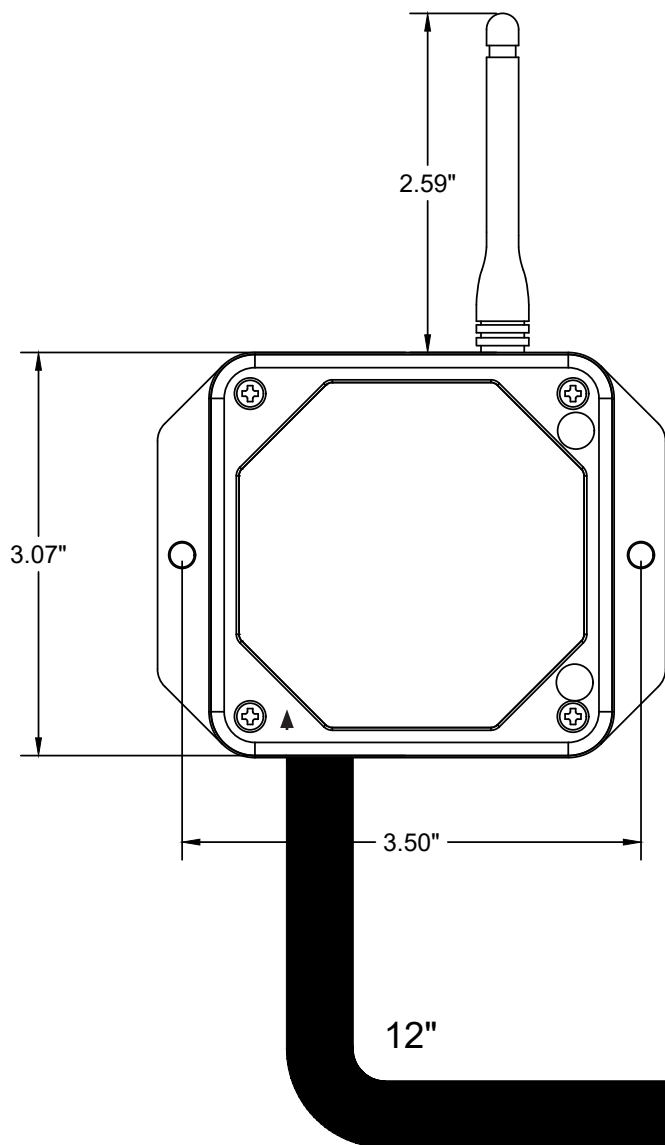
## SPECIFICATIONS

- RF: 2.4GHz FHSS 100mW
- Temperature:
  - o Receiver: -40 to +85°C
  - o Transmitter: -20 to 60°C
- Transmitter Power: 3.7V LiPo rechargeable battery, Battery life: 30-40 hours continuous
- Micro-USB Charger Port
- Receiver Power: 9-30V DC

SN: 25A49+ come standard with the 2.4GHz remote systems. Old remote systems and the 2.4 GHz components are NOT compatible. Reference **page 72**.

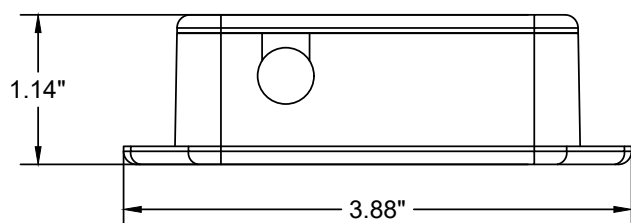
BUTTON PRESS	ENGAGE OUTPUTS
LOWER HOPPER	A
LIFT HOPPER	B
LOWER BROOM	C
RAISE BROOM	D
CLOSE	E
OPEN	F
BLOWER ON/OFF	G (LATCHING)
BROOM ON/OFF	H (LATCHING)





TRANSMITTER ERROR CODE CHART	
ERROR CODE	PROBABLE CAUSE
1	LOW BATTERY
2	FAULTY CIRCUIT TO OUTPUT B
3	FAULTY CIRCUIT TO OUTPUT A
4	FAULTY CIRCUIT TO OUTPUT D
5	FAULTY CIRCUIT TO OUTPUT C
6	FAULTY CIRCUIT TO OUTPUT F
7	FAULTY CIRCUIT TO OUTPUT E
8	FAULTY CIRCUIT TO OUTPUT H
9	FAULTY CIRCUIT TO OUTPUT I

ERROR CODE NUMBER IS THE NUMBER OF RED LIGHT BLINKS BETWEEN EVERY PAUSE



CONN:055-157-1200 CABLE: 020-050-1218	
PIN	DESCRIPTION
1	POWER (9-30V)
2	GROUND
3	OUTPUT A
4	OUTPUT B
5	OUTPUT C
6	OUTPUT D
7	OUTPUT E
8	OUTPUT F
9	OUTPUT I
10	OUTPUT G
11	OUTPUT H
12	INPUT J



## Service & Maintenance



### SAFETY WARNING!

Before servicing or inspecting the Turbo Vac, make sure the power source is shut off and all moving parts have stopped.



### SAFETY WARNING!

Disconnect the spark plug wire or the negative battery cable to prevent the engine from being turned on.



### SAFETY WARNING!

Always wear safety glasses and protective gloves when servicing the Turbo Vac.

### Break-in Service

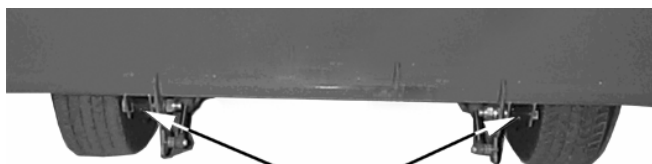
#### After the first hour of use:

- Check belts. Tighten if needed.
- Tighten set screws on bearings.
- Check nuts, bolts, and fasteners to see that they are secure. Tighten if needed.
- Check hydraulic hoses and fittings for leaks using the method described in the General Safety Guidelines. Tighten or replace if needed.

### Lubrication

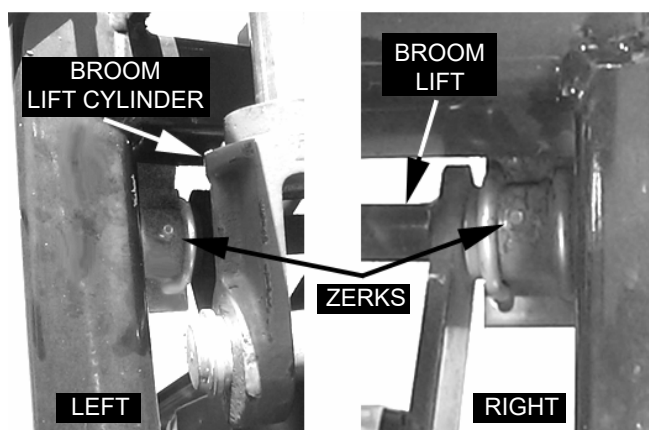
Nine grease zerks in the following locations should be greased daily to reduce wear:

- Hopper door latches (2)

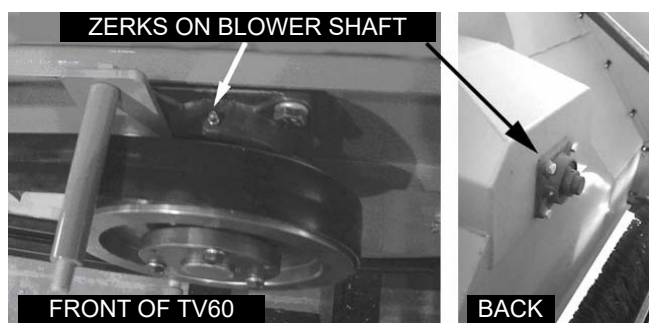


HOPPER DOOR LATCH ZERKS

- Broom lift (2)



- Blower shaft (2)



**Note:** The safety shield must be removed to access grease zerk on front blower shaft of the **TV60RE**.

- Broom shaft (1)
- Broom wheels (2)



- Replace the safety shields before operating the Turbo Vac.

## Hydraulic System

- The hydraulic system of the **TV60RE** is filled at the factory with Crown AW 46 hydraulic oil that has an ISO of 46.
- The **TV60RE** has a 10 micron, beta rated hydraulic oil filter designed for long life.

The following list of hydraulic fluids can be mixed with Crown Hydraulic Fluid. **MIXING OILS NOT ON THIS LIST COULD CAUSE GELLING AND DAMAGE TO THE HYDRAULIC COMPONENTS.** If another type of oil is desired, then the system must be completely drained and flushed first.

## Appropriate replacements:

**ISO 46:** Recommend for running in ambient air temperatures of 32°F-110°F, and it contains a kinematic viscosity rating around 46 cSt at 40°C. (1cSt = 1mm<sup>2</sup>/s)

- Mobil DTE 25
- Mobil DTE 15M
- Amoco Rykon Premium Oil ISO 46
- Chevron Rykon Premium Oil ISO 46
- Conoco Hydroclear AW MV 46
- Exxon Univis N 46
- Pennzoil AWX MV 46
- Shell Tellus 52 M46
- Shell Tellus 52 V46
- Texaco Rando HDZ 46

## TV60RE Hydraulic Oil Reservoir

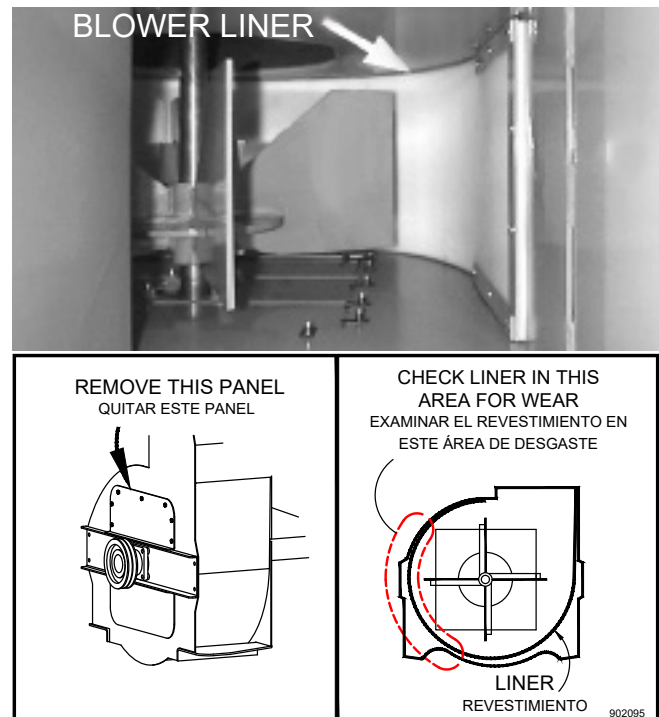
- Maintain the hydraulic oil between the upper and lower site bulbs at all times.
- Replace the spin-on oil filter (P/N 720043) every **250 hours** of service.
- Replace Hydraulic oil every **500 hours**.

## Blower Liner

- Inspect the blower liner in the blower housing for wear **every 8 hours**.
- If the blower liner wears excessively, it could damage the blower housing.
- The blower liner is a wear item and is not covered under warranty.
- Sandy conditions will shorten the life of the blower liner.

## To check the blower liner:

- Raise hopper, set the safety lock as shown in the General Safety Guidelines.
- Check the blower liner as shown.
- If the liner is damaged or worn, replace it before it damages the blower housing.



**! SAFETY WARNING! !**  
To inspect the liner, the power must be OFF, the unit has come to a complete stop, and the spark plug wire removed.

**! SAFETY WARNING! !**  
When working under the hopper the cylinder safety lock should be engaged to prevent the hopper from falling.

## Electrical Wiring

- A 20 AMP fuse is located in the wiring harness (932061) near the starter solenoid.



## Return Air Screens



- The return air screens do not require cleaning on a regular basis.
- Material that sticks to the screens during operation will fall off when the blower is stopped. However, if debris is extremely wet or muddy, plugging may occur.
- If there is a noticeable decline in ability to pick up debris, visually inspect screens for clogging and clean, if necessary.
- The return air screens may be cleaned with a broom or water hose, and may be removed, if necessary.



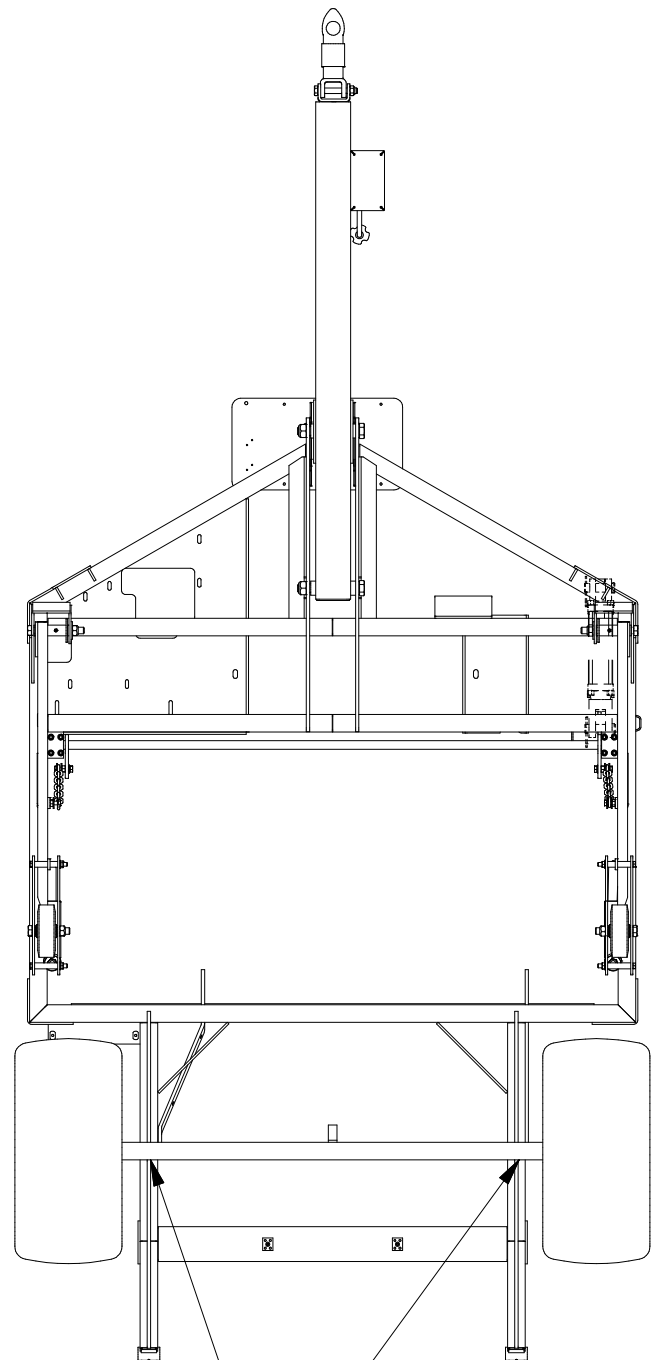
### **SAFETY WARNING!**

When it is necessary to get between the hopper and the hopper door, set the door prop to avoid being pinched.

- To set door prop, pull the door open and insert prop into the pre-cut hole in door.



## Lift Points for Servicing Wheels



PLACE JACK UNDER  
AXLE SUPPORT

## TV60RE Service Schedule

- **Disclaimer – For the 23.5 HP engine, Kohler Engine Co. recommends the following:**

### Daily or Before Starting Engine

Check engine oil level.....	SAE 10W-30
Check hydraulic oil level.....	Crown AW46 or equivalent
Fill fuel tank.....	Clean, unleaded, 87 octane or higher
Check air intake and cooling areas.....	Clean as necessary.
Visually inspect belts, bolts, fittings and hoses.....	Tighten or replace if necessary.
Grease.....	See Service & Maintenance section.
Check tire pressure.....	Inflate to pressure listed on the side of the tire.

### 100 Hour Service – Perform these and all previous items:

Check outer air cleaner element.....	Kohler part # 25 083 01-S
(change if element appears dusty due to severe conditions)	
Change engine oil.....	2.0 quarts SAE 10W30
Remove cooling shrouds.....	Clean cooling areas.
Check battery.....	Clean terminals if necessary.
Change hydraulic filter.....	DewEze part # 720043
	Wix part # 51551

### 200 Hour Service – Perform these and all previous items:

Check spark plug.....	Set gap to 0.76 mm (.030 in.)
	Kohler part # 12 132 02-S
	Champion part # RC12YC
Change oil filter.....	Kohler part # 12 050 01-S

### 250 Hour Service

Change outer air cleaner element.....	Kohler part # 25 083 01-S
Check inner air cleaner element.....	Kohler part # 25 083 04-S
(change if element appears dusty due to severe conditions)	

### Annual or 500 Hour Service – Perform these and all previous items:

Have Bendix starter drive serviced.*	
Have solenoid shift starter disassembled and cleaned.*	
Change hydraulic oil.....	5 gallons
	Crown AW46 or equivalent
Change inner air cleaner element.....	Kohler part # 25 083 04-S

- **Should be serviced by an authorized Kohler Dealer.**
- **Refer to Kohler engine manual for more information on engine servicing.**
- **The identification number of the 23.5 HP Kohler EFI engine is: PA-CH730-0142.**

## Standard Torque Chart



### SAFETY WARNING!

Refer to the Standard Torque Chart whenever bolts, nuts or screws are tightened.

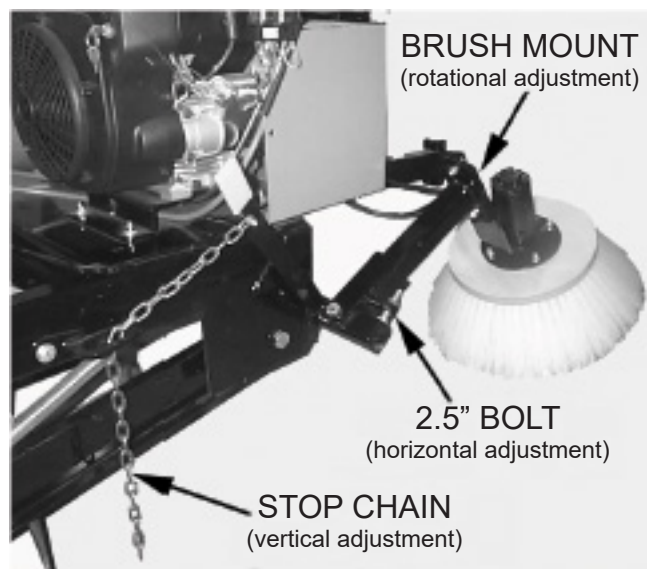
Size	In-Lbs	Ft-Lbs	N-m
No. 10-24	25-35	5-7	2.8-4.0
¼ in.	60-80	18-20	7-9
5/16 in.	120-140	28-30	14-16
3/8 in.	340-360	64-74	24-27
½ in.		126-150	90-100

**Note:** When tightening two or more fasteners on the same part, DO NOT tighten the fasteners completely one at a time. To avoid distortion, first tighten all fasteners in sequence to one-third of torque value, then tighten to two-thirds of torque value, then tighten to full value.

## Optional Equipment

### Edge Brush

- A fence brush kit (900218) is available for cleaning areas along fences and curbs, etc., that are difficult to reach with the Turbo Vack broom.



- The fence brush can be adjusted vertically and horizontally, as well as rotated at an angle, so that debris is thrown into the Turbo Vac broom. For best results, angle the front edge of the brush downward.
- The stop chain is used to adjust the height of the fence brush during operation and to hold it up during transport.
- Never allow the brush to rest completely on the ground during operation.



### SAFETY WARNING!



The Turbo Vac should never be transported with the fence brush in operating position. Always use the stop chain to suspend the brush during transport.

## Troubleshooting

<b>TV60RE Engine:</b>	
<b>Problem:</b>  Engine will not start	<b>What to Check:</b>  <ul style="list-style-type: none"> <li>• Improper control settings</li> <li>• Engine may be low on fuel</li> <li>• Engine may be low or too full of oil</li> <li>• Battery charge may be too low</li> <li>• Possible internal problems</li> <li>• Manual fast idle switch may be engaged, switch must be shut off for engine to start.</li> </ul>
<b>Problem:</b>  Engine shuts off during operation	<b>What to Check:</b>  <ul style="list-style-type: none"> <li>• Engine may be low on fuel</li> <li>• Engine may be low on oil</li> <li>• Air breather may be clogged</li> </ul>
<b>Belts:</b>	
<b>Problem:</b>  Belts slip	<b>What to Check:</b>  <ul style="list-style-type: none"> <li>• Tension adjustment</li> <li>• Excessive load</li> <li>• Lodged foreign material</li> <li>• Seized bearings</li> </ul>
<b>Problem:</b>  Belts wear rapidly; Belts jump, catch or twist	<b>What to Check:</b>  <ul style="list-style-type: none"> <li>• Pulleys out of alignment</li> <li>• Use straightedge to check across pulley faces</li> </ul>
<b>Hydraulic System:</b>	
<b>Problem:</b>  Hydraulic function will not respond or hold its position	<b>What to Check:</b>  <ul style="list-style-type: none"> <li>• RF receiver or transmitter malfunctioning</li> <li>• Hydraulic cylinder seals worn, replace them</li> </ul>

# *Parts*

## TV60RE



TV60R



# Table of Contents

## PARTS SECTION

### Frame

Frame Assembly.....	35-36
Wheel Assembly.....	37
Deck Arm Assembly.....	38
Attaching Deck Arms.....	39

### Blower Installation

Fan Assembly.....	41
Fan Shaft Assembly.....	42
Fan Housing Assembly.....	43
Blower Housing Installation.....	44
Fan Housing Installation.....	45
Air Return.....	46
Seal & Trim Installation.....	47

### Hopper and Door Assemblies

Sight Window Installation.....	49
Screen Installation.....	50
Hopper w Decals.....	51
Lift Lock Installation.....	53
Door Latch Installation.....	54
Door Installation.....	55
Door Assembly.....	56

### Hydraulics Installation

Hydraulic Pump Assembly.....	58
Hydraulic Reservoir.....	59
Broom Hydraulic Assembly.....	60
Hopper Lift & Door Latch Hydraulics.....	61-62
Valve Assembly.....	63
Hydraulic Schematic.....	64

### Engine Installation

Engine Assembly.....	65
Electric Clutch Kit.....	67
Engine Installation.....	68
Engine Fuel, Emissions & Electrical.....	69
Engine Service Parts.....	70

### Electronics Installation

Electronics Installation.....	71
Control Panel Assembly.....	72
Wiring Schematic (Kar-Tech Remote).....	73
Engine Harness Schematic.....	74

### Decals and Final Installation

Export Kit.....	75
Final Installation.....	76
Decal Installation (Left).....	77
Decal Installation (Right).....	78
Decal Installation (General).....	79

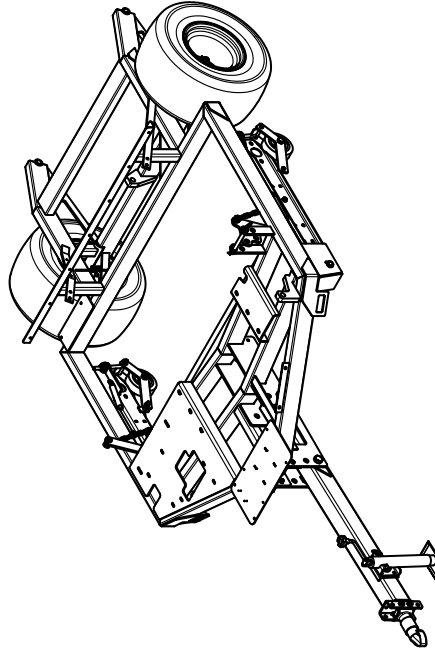
### Options

Broom Kit.....	80
Broom Assembly.....	81
Finger Rotor Kit.....	82
Finger Rotor Assembly.....	83
Fence Brush Option.....	84-85
Edge Brush Instructions.....	86

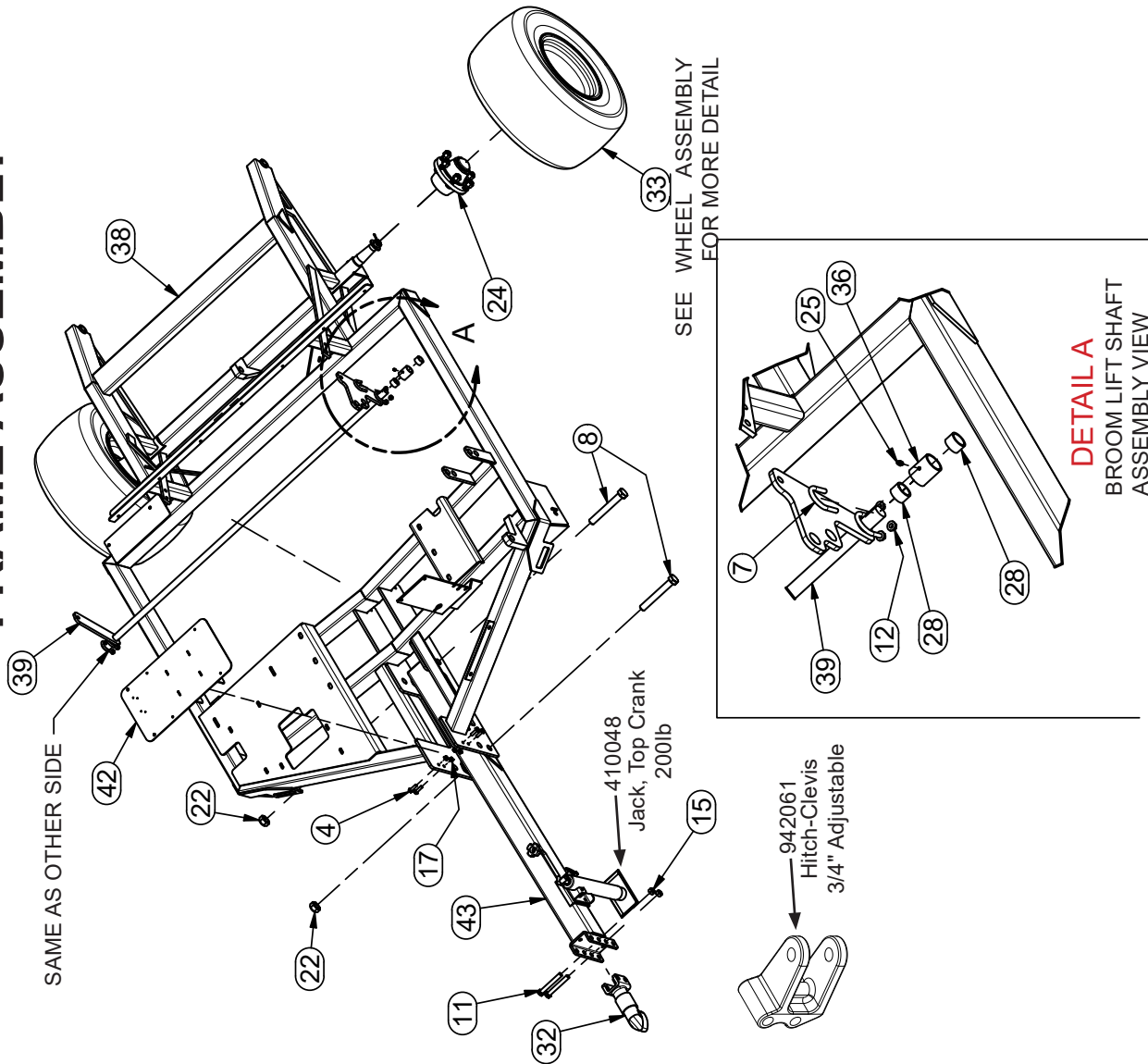


Parts List				Parts List				Parts List				905131	REV: E
ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION		
1	1	102015	HITCH PIN, 3/4 X 6 W/KEEPER	15	2	110639	NUT, 5/8-11, UNITORQUE LOCK	30	2	940126	BROOM LIFT CHAIN		
2	4	110039	NUT, 5/8-11 JAM	16	4	110641	NUT, 7/16-14	31	4	942054	SPRING		
3	4	110068	WASHER, 1.25 OD X .75 ID X .075	17	4	110645	NUT, 3/8-16 WIZ FLANGE	32	1	942184	COUPLER, 2" FORGED 7000#		
4	4	110161	BOLT, 3/8-16 X 1.25, WIZ FLANGE	18	4	110650	WASHER, 5/8" FLAT STANDARD	33	2	943053	Tire & Wheel Assy, 26" Grassmaster		
5	4	110321	BOLT, 7/16-14 X 1.75 GR 5 HEX HEAD	19	2	110655	WASHER, 5/8" LOCK	34	4	970067	BROOM WHEEL BRACKET		
6	8	110337	NUT, 7/16-14 WIZ FLANGE	20	8	110670	WASHER, 7/16" FLAT STANDARD	35	2	970254	CASTER WHEEL BOLT		
7	4	110362	U-BOLT, 5/16	21	2	110677	WASHER, 3/4" FLAT STANDARD	36	2	970370	BROOM LIFT BUSHING		
8	2	110364	BOLT, 1-8 X 7.0	22	2	111226	NUT, 1-8, UNITORQUE LOCK	37	2	975015	WHEEL HEIGHT ADJ. WLDMNT		
9	2	110383	BOLT, 3/4-10 X 6.0	24	2	413001	HUB COMPLETE, 35-6LM	38	1	975095	FRAME WLDMNT, TV60RE		
10	4	110527	BOLT, 7/16-14 X 4.0	25	4	510174	GREASE ZERK, 1/4-28 ST	39	1	975098	BROOM LIFT WELDMENT		
11	2	110562	BOLT, 5/8-11 X 4.5	27	4	800128	BUSHING, IGUS, FOOT PEDAL	40	1	975121	LEFT BROOM ARM WLDMNT		
12	8	110606	NUT, 5/16-18 WIZ FLANGE	28	4	922006	BUSHING, 1.75 X 1 X .75E	41	1	975122	RIGHT BROOM ARM WLDMNT		
14	4	110625	NUT, 3/4-10, UNITORQUE LOCK	29	2	940043	CASTER WHEEL ASSY	42	1	975175	Weldment, Tank Mount		
								43	1	975436	WELDMENT, TV60R HD HITCH		

## TV60RE FRAME ASSEMBLY



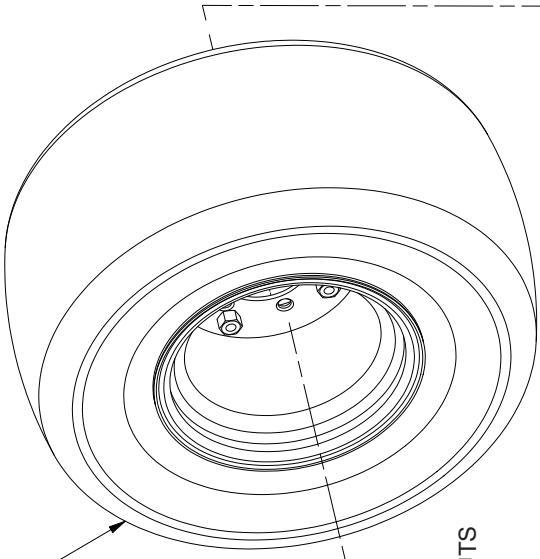
# FRAME ASSEMBLY



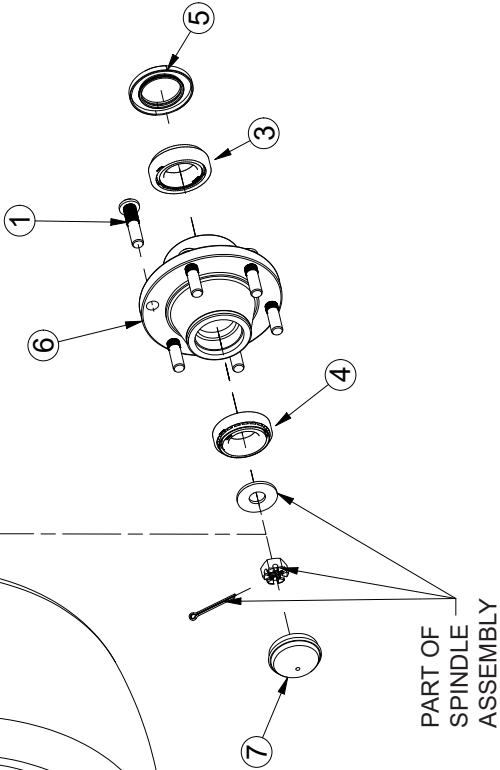
WHEEL ASSEMBLY

905131	REV: E
--------	--------

33 SHT 1 BOM



2  
TORQUE LUGNUTS  
TO 120 LB-FT



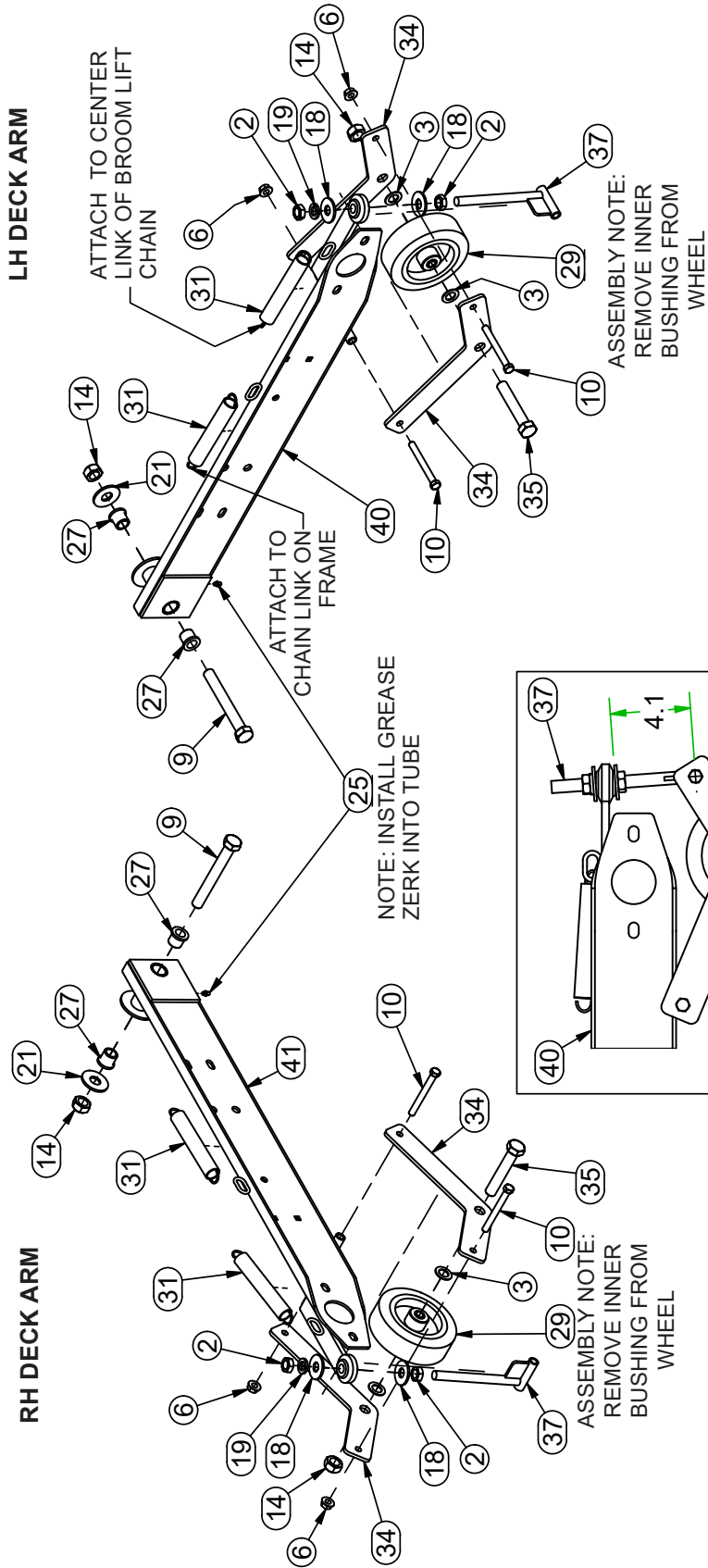
**TORQUE SPECIFICATIONS**  
Lugnuts: 120 LB-FT  
Castle Nut (Hub): 50 LB-FT, Loosen one full turn, re-torque to 10 lb-ft then install cotter pin.

943053 WHEEL ASSEMBLY		
413001 HUB ASSEMBLY		
ITEM	QTY	PART # DESCRIPTION
1	6	113006 Stud 9/16-18
2	6	113007 Nut 9/16-18
3	1	410114 Bearing, 2.8910 X .58
4	1	410115 Bearing, 2.328 X .465
5	1	410105 SEAL
6	1	410111 Hub 6X6in
7	1	410112 DUST CAP

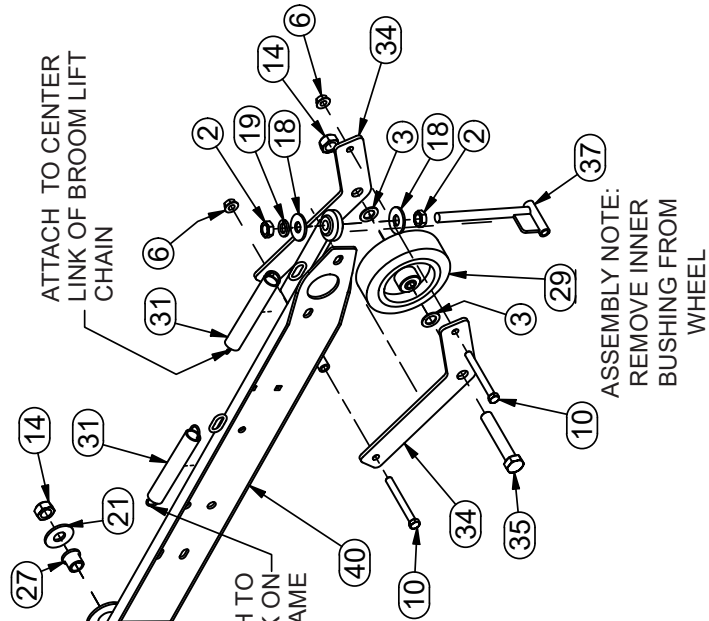
Parts List												905131		REV: E
Parts List												Parts List		
ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION			
2	4	110039	NUT, 5/8-11 JAM	18	4	110650	WASHER, 5/8" FLAT STANDARD	31	4	942054	SPRING			
3	4	110068	WASHER, 1.25 OD X .75 ID X .075	19	2	110655	WAWASHER, 5/8" LOCK	34	4	970067	BROOM WHEEL BRACKET			
6	8	110337	NUT, 7/16-14 WIZ FLANGE	21	2	110677	WASHER, 3/4" FLAT STANDARD	35	2	970254	CASTER WHEEL BOLT			
9	2	110383	BOLT, 3/4-10 X 6.0	25	4	510174	GREASE ZERK, 1/4-28 ST	37	2	975015	WHEEL HEIGHT ADJ. W/DMNT			
10	4	110527	BOLT, 7/16-14 X 4.0	27	4	800128	BUSHING, IGUS, FOOT PEDAL	40	1	975121	LEFT BROOM ARM W/DMNT			
14	4	110625	NUT, 3/4-10, UNITORQUE LOCK	29	2	940043	CASTER WHEEL ASSY	41	1	975122	RIGHT BROOM ARM W/DMNT			

## DECK ARM ASSEMBLIES

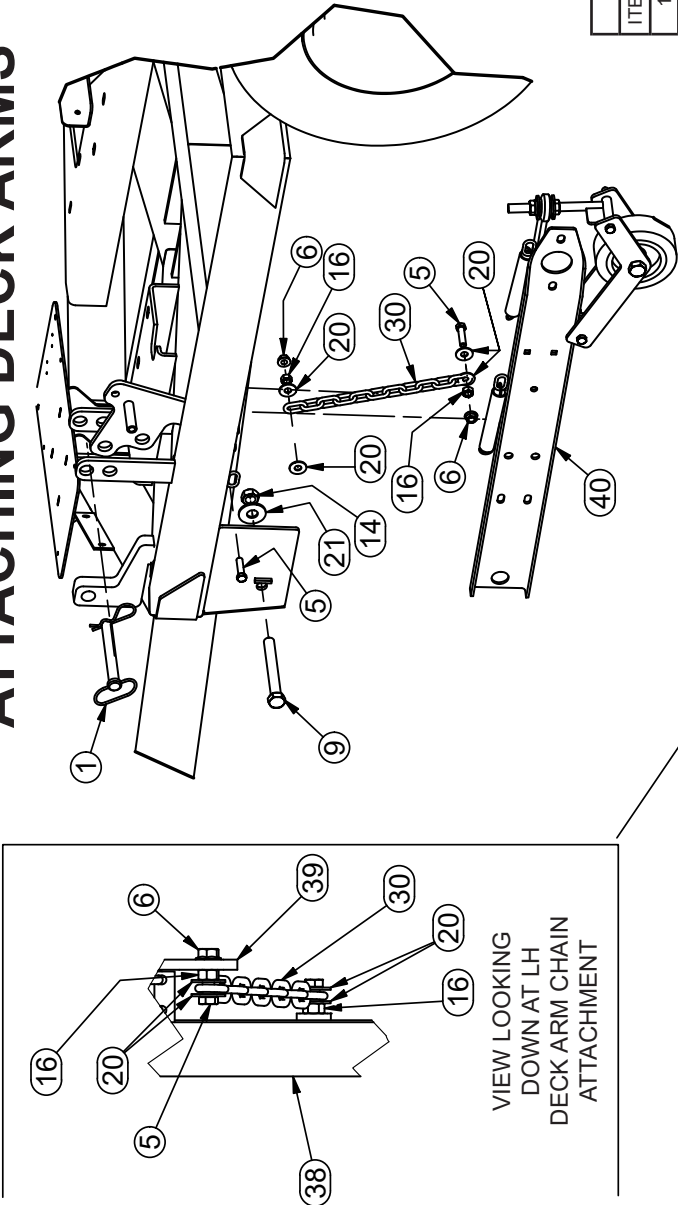
**RH DECK ARM**



**LH DECK ARM**

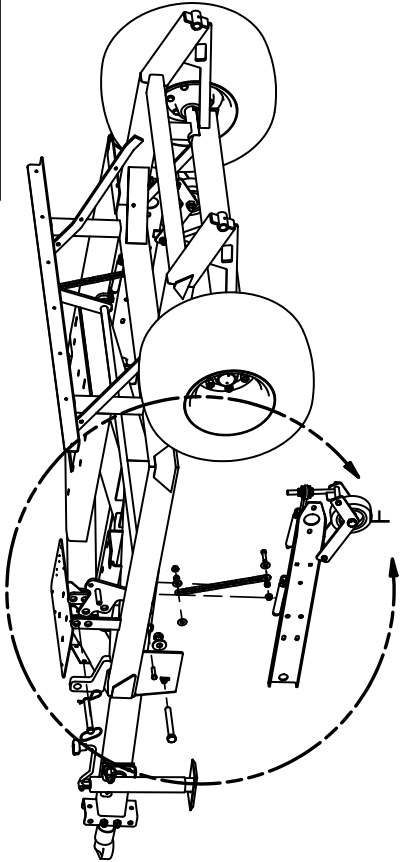


# ATTACHING DECK ARMS

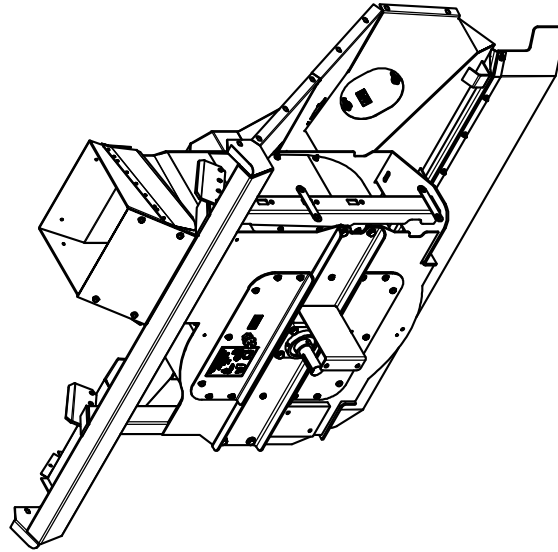


Parts List			
ITEM	QTY	PART #	DESCRIPTION
1	1	102015	HITCH PIN, 3/4 X 6 W/KEEPER
5	4	110321	BOLT, 7/16-14 X 1.75 GR 5 HEX HEAD
6	8	110337	NUT, 7/16-14 WIZ FLANGE
9	2	110383	BOLT, 3/4-10 X 6.0
14	4	110625	NUT, 3/4-10, UNITORQUE LOCK
16	4	110641	NUT, 7/16-14
20	8	110670	WASHER, 7/16" FLAT STANDARD
21	2	110677	WASHER, 3/4" FLAT STANDARD
30	2	940126	BROOM LIFT CHAIN
38	1	975095	FRAME WLDMNT, TV60RE
39	1	975098	BROOM LIFT WELDMENT
40	1	975121	LEFT BROOM ARM WLDMNT

NOTE: ATTACH RIGHT ARM THE SAME



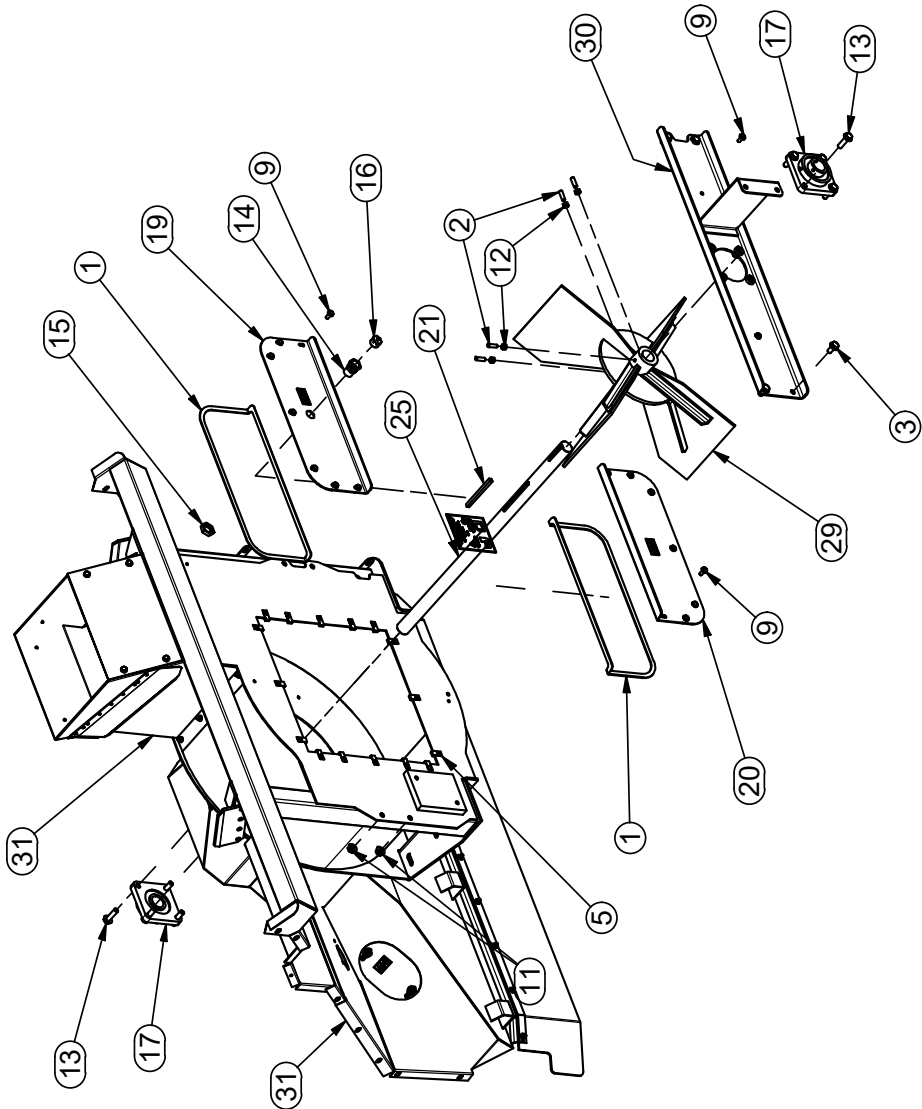
905132												REV: C											
Parts List												Parts List											
ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION												
1	10 ft	100613	Seal, .50 X .187	11	4	110588	Nut, 1/2-13 Wiz Flange	21	1	940113	Key, 3/8 X 5												
2	4	110093	Setscrew, 3/8-16 X 1.25	12	4	110826	Nut, 3/8-16 Gr 5	22	1	970086	Clamp Bar												
3	4	110220	Bolt, 1/2-13 X 1, Wiz Flange	13	8	111222	Bolt, 1/2-13 X 1.75, Wiz Flange	23	2	970161	Blower Liner Retainer, Inner												
4	23	110290	Nut, 1/4-20 Wiz Flange	14	1	302060	Swivel, Garden Hose-To-Pipe	24	2	970162	Blower Liner Retainer, Outer												
5	24	110319	Nut, 5/16-18 U-Type .75l	15	1	302061	Locknut, 3/4 Npt	25	1	970287	Blower Shaft												
6	12	110326	Bolt, 1/4-20 X 1 In Carriage	16	1	302062	Plug, Garden Hose	26	1	970558	Blower Plate												
7	4	110327	Nut, 5/16x18 Wing	17	2	410851	Bearing, 4fng 1 1/2"	27	1	972008	Debris Flap												
8	4	110423	Bolt, 5/16-18 x 1.0	18	2	905122	Assembly, Nozzle Access Cover	28	1	972010	Blower Liner, .250 Uhmw												
9	20	110444	Bolt, 5/16-18 X 0.75, Wiz Flange	19	1	905194	Assy, Upper Fan Shield W/Decal	29	1	975001	Fan Assy Wldmnt												
10	11	110464	Bolt, 1/4-20 X 1.0	20	1	905195	Assy, Lower Fan Shield W/Decal	30	1	975102	Bearing Channel												
								31	1	975150	Weldment, Blower Housing, Efi												



## TV60RE BLOWER HOUSING ASSEMBLY

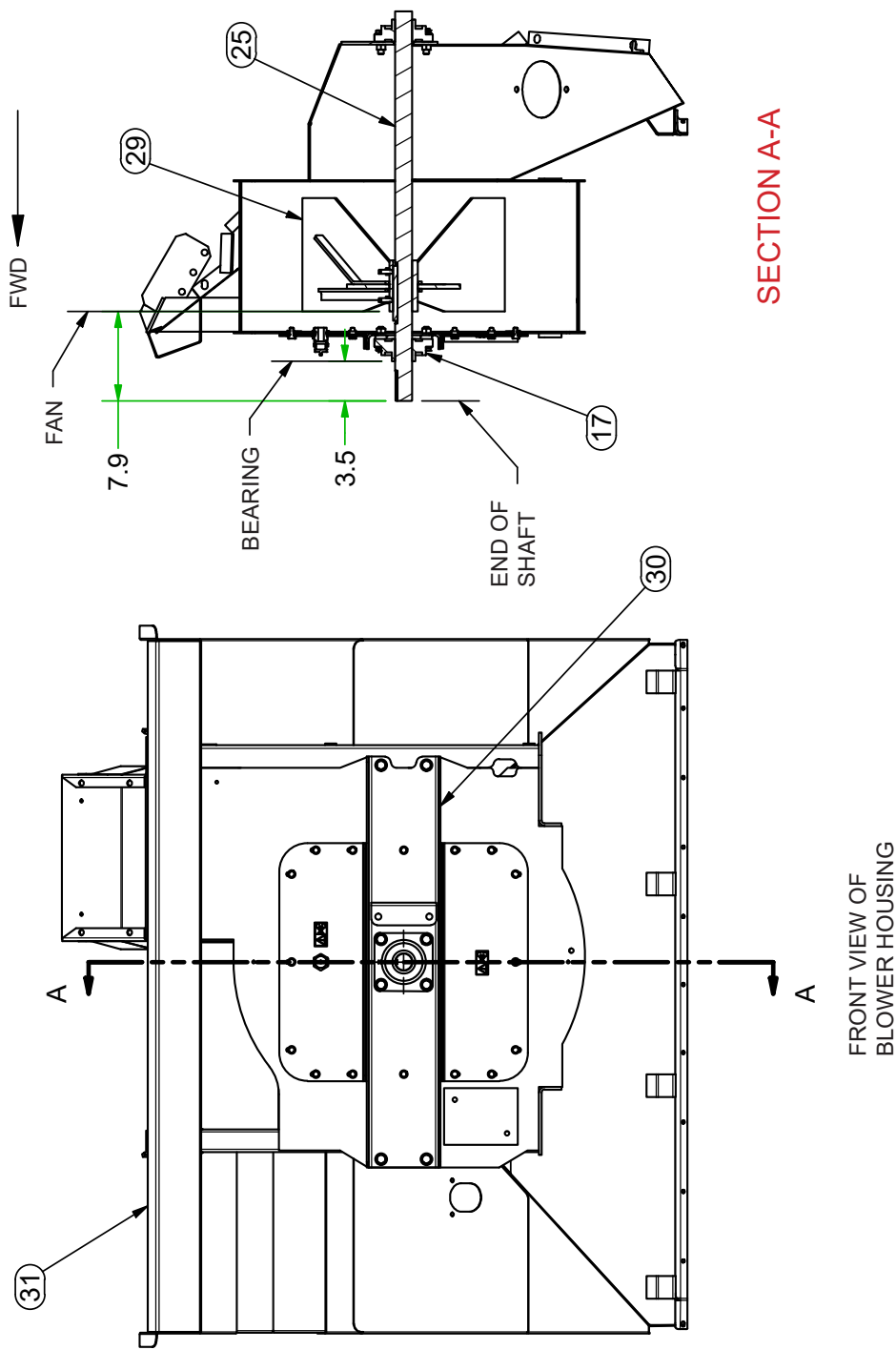


# FAN ASSEMBLY



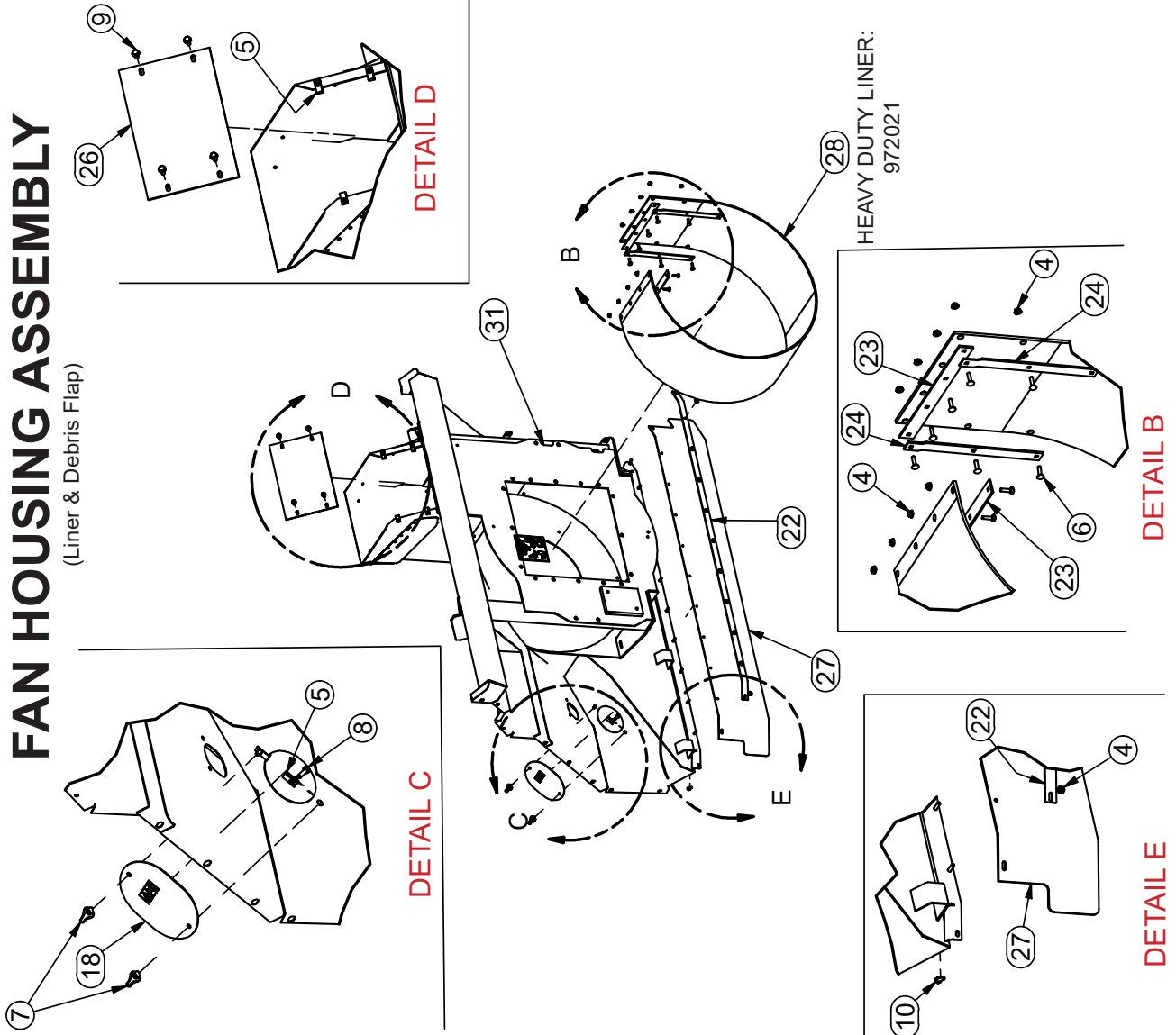
Parts List			
ITEM	QTY	PART #	DESCRIPTION
1	10 ft	100613	Seal, .50 X .187
2	4	110093	Setscrew, 3/8-16 X 1.25
3	4	110220	Bolt, 1/2-13 X 1, Wiz Flange
5	24	110319	Nut, 5/16-18 U-Type .75l
9	20	110444	Bolt, 5/16-18 X 0.75, Wiz Flange
11	4	110588	Nut, 1/2-13 Wiz Flange
12	4	110826	Nut, 3/8-16 Gr 5
13	8	111222	Bolt, 1/2-13 X 1.75, Wiz Flange
14	1	302060	Swivel, Garden Hose-To-Pipe
15	1	302061	Locknut, 3/4 Npt
16	1	302062	Plug, Garden Hose
17	2	410851	Bearing, 4fmg 1 1/2"
19	1	905194	Assy, Upper Fan Shield W/Decal
20	1	905195	Assy, Lower Fan Shield W/Decal
21	1	940113	Key, 3/8 X 5
25	1	970287	Blower Shaft
29	1	975001	Fan Assy Widmnt
30	1	975102	Bearing Channel
31	1	975150	Weldment, Blower Housing, Efi

# FAN SHAFT ASSEMBLY

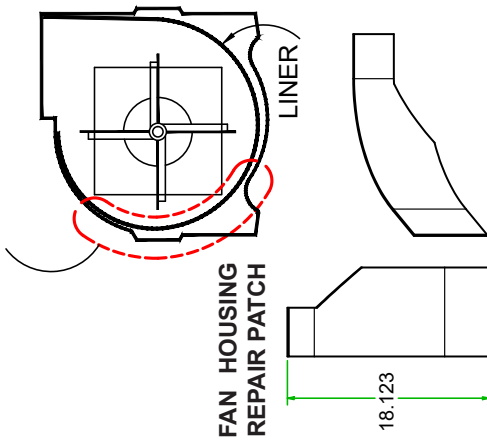


# FAN HOUSING ASSEMBLY

(Liner & Debris Flap)



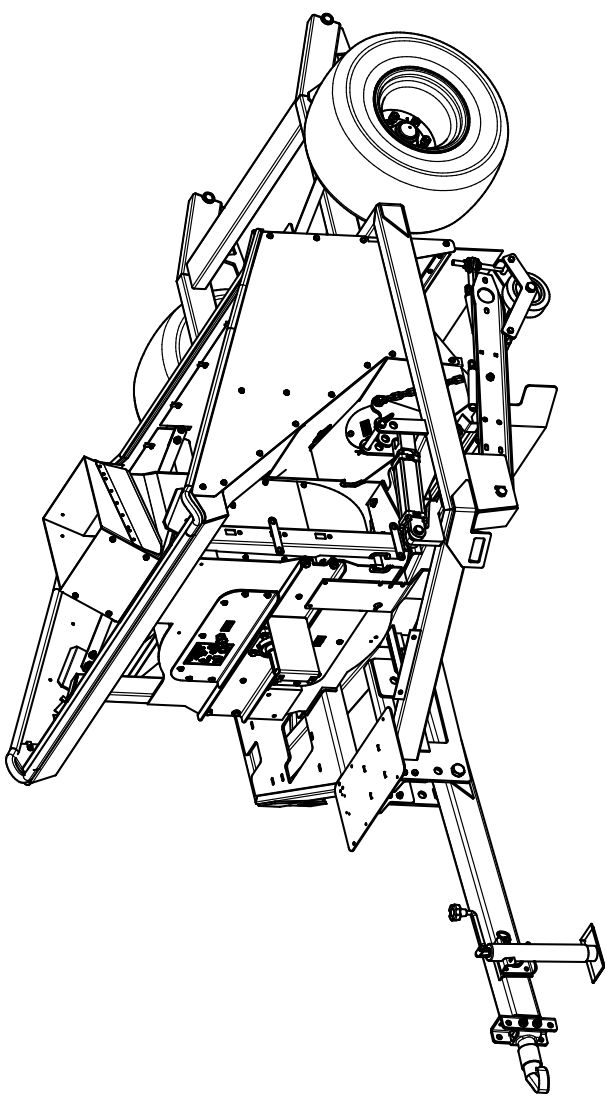
CHECK LINER IN THIS AREA FOR WEAR



IF LINER NOT REPLACED, THE HOUSING WILL WEAR. WELD METAL PATCH 911251 TO REPAIR.

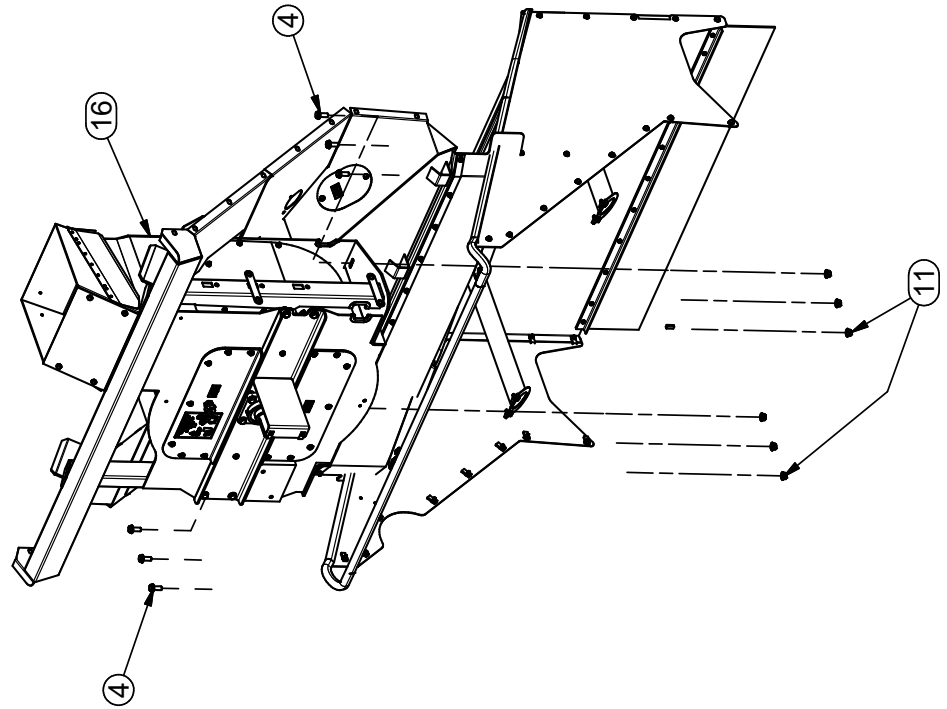
Parts List			
ITEM	QTY	PART #	DESCRIPTION
4	23	110290	Nut, 1/4-20 Wz Flange
5	24	110319	Nut, 5/16-18 U-Type .75l
6	12	110326	Bolt, 1/4-20 X 1 In Carriage
7	4	110327	Nut, 5/16x18 Wing
8	4	110423	Bolt, 5/16-18 X 1.0
9	20	110444	Bolt, 5/16-18 X 0.75, Wz Flange
10	11	110464	Bolt, 1/4-20 X 1.0
18	2	905122	Assembly, Nozzle Access Cover
22	1	970086	Clamp Bar
23	2	970161	Blower Liner Retainer, Inner
24	2	970162	Blower Liner Retainer, Outer
26	1	970558	Blower Plate
27	1	972008	Debris Flap
28	1	972010	Blower Liner .250 Uhmw
31	1	975150	Weldment, Blower Housing, Efi

# BLOWER HOUSING INSTALLATION



Parts List			
ITEM	QTY	PART #	DESCRIPTION
1	6 ft	100360	Moulding, Edge, Air Inlet
2	30 in	100365	Trim, Edge, .085 To .210 Thickness
3	15 ft	102004	D Seal, 1.00 X 1.00
4	6	110001	Bolt, 1/2-13 X 1.25, Wiz Flange
5	11	110290	Nut, 1/4-20 Wiz Flange
6	41	110319	Nut, 5/16-18 U-Type .75l
7	2	110426	Bolt, 5/16-18 X 0.5, Wiz Flange
8	8	110429	Bolt, 1/2-13 X 1.5
9	39	110444	Bolt, 5/16-18 X 0.75, Wiz Flange
10	11	110464	Bolt, 1/4-20 X 1.0
11	6	110588	Nut, 1/2-13 Wiz Flange
12	6	110596	Nut, 3/4-10
13	2	110606	Nut, 5/16-18 Wiz Flange
14	8	110615	Nut, 1/2-13, Unitorque Lock
15	2	110713	Bolt, 3/4-10 X 3.5 Tap
16	1	905132	Assembly, Tv60re Blower Housing
17	1	970390	Back Air Return
18	1	970391	Left Air Return
19	4	970393	Truss Bar
20	1	970394	Flap Retainer
21	2	970542	Angle, Air Return
22	1	970545	Rear Seal
23	1	970685	Debris Flap Main
24	1	970882	Right Air Return Shield
25	2	975111	Hose Tube

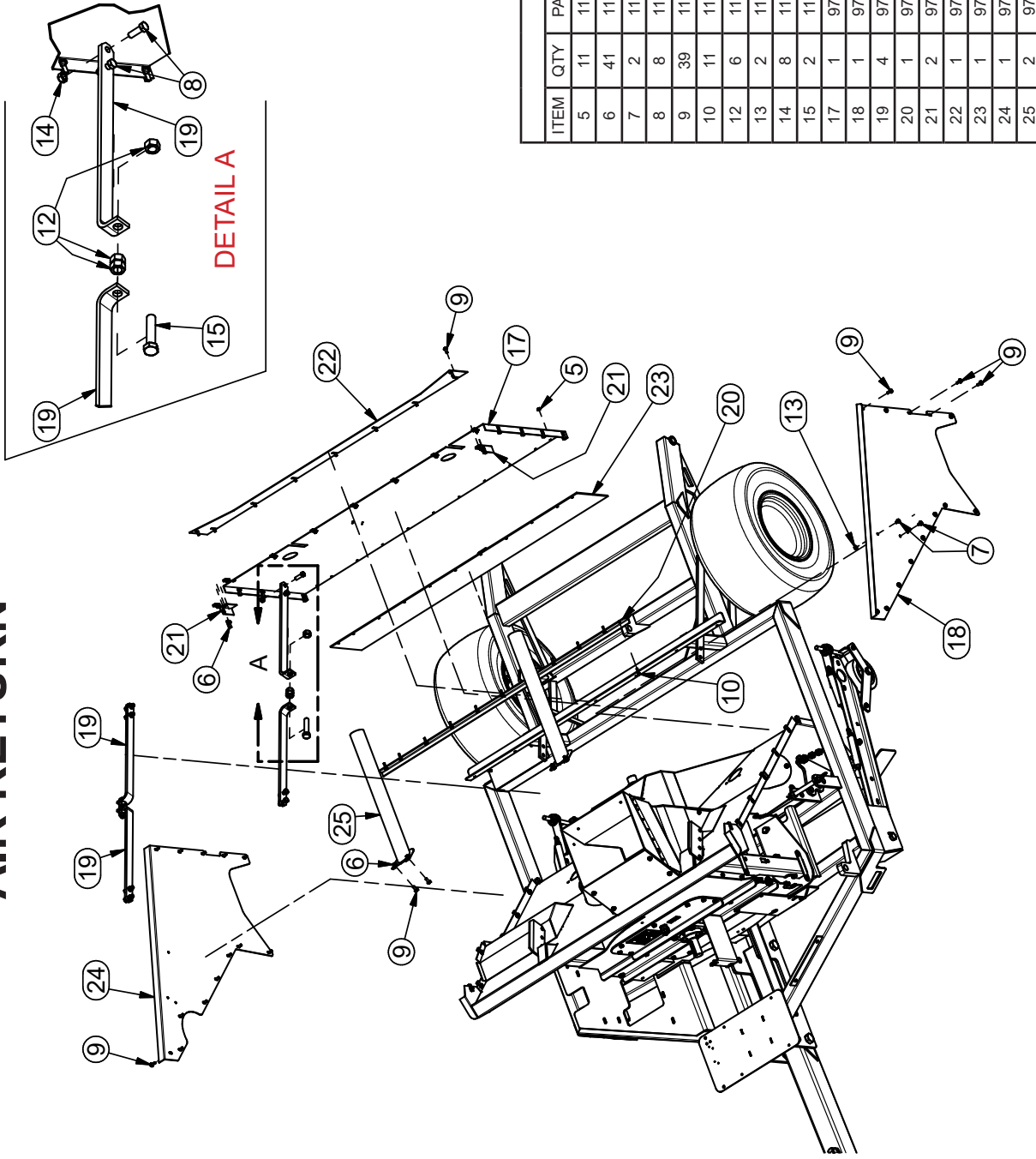
# FAN HOUSING INSTALLATION



Parts List			
ITEM	QTY	PART #	DESCRIPTION
4	6	110001	Bolt, 1/2-13 X 1.25, Wiz Flange
11	6	110588	Nut, 1/2-13 Wiz Flange
16	1	905132	Assembly, Tv60re Blower Housing

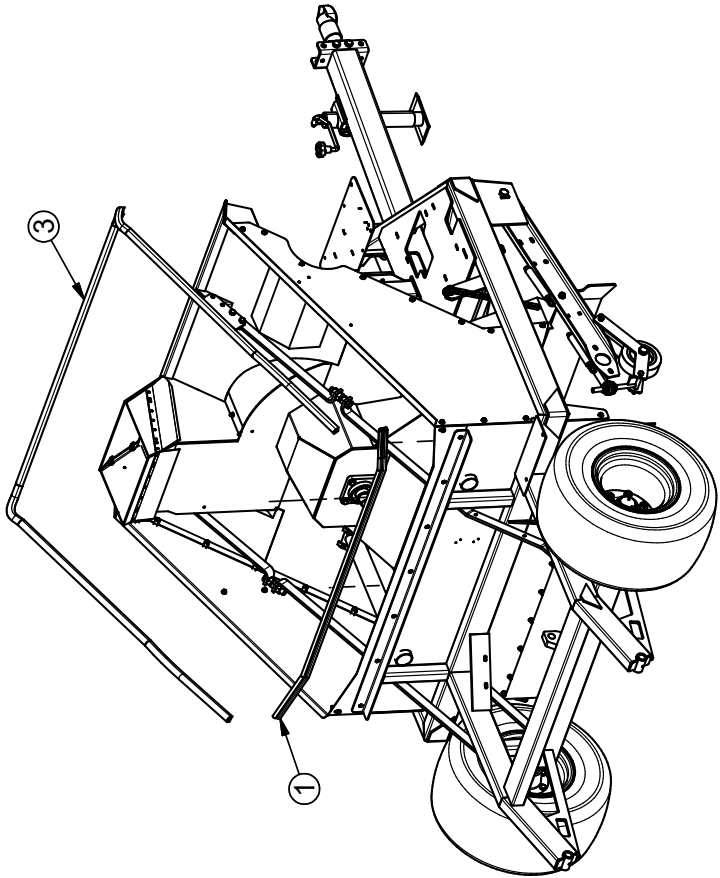
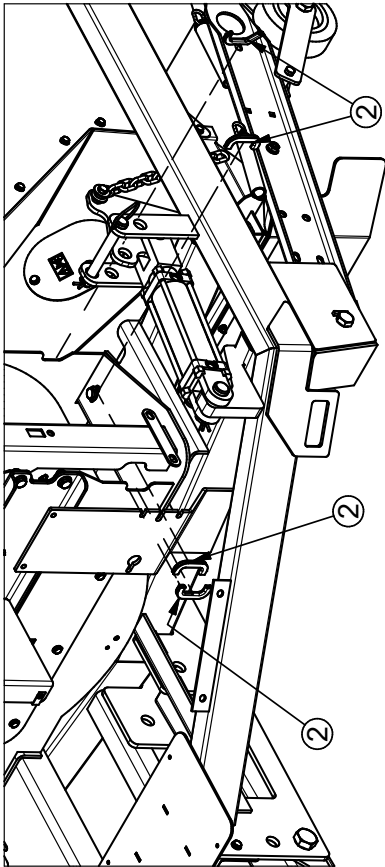


# AIR RETURN



Parts List			
ITEM	QTY	PART #	DESCRIPTION
5	11	110290	Nut, 1/4-20 Wiz Flange
6	41	110319	Nut, 5/16-18 U-Type .75l
7	2	110426	Bolt, 5/16-18 X 0.5, Wiz Flange
8	8	110429	Bolt, 1/2-13 X 1.5
9	39	110444	Bolt, 5/16-18 X 0.75, Wiz Flange
10	11	110464	Bolt, 1/4-20 X 1.0
12	6	110596	Nut, 3/4-10
13	2	110606	Nut, 5/16-18 Wiz Flange
14	8	110615	Nut, 1/2-13, Unitorque Lock
15	2	110713	Bolt, 3/4-10 X 3.5 Tap
17	1	970390	Back Air Return
18	1	970391	Left Air Return
19	4	970393	Truss Bar
20	1	970394	Flap Retainer
21	2	970542	Angle, Air Return
22	1	970545	Rear Seal
23	1	970685	Debris Flap Main
24	1	970882	Right Air Return Shield
25	2	975111	Hose Tube

# SEAL & TRIM INSTALLATION



Parts List		
ITEM	QTY	PART # DESCRIPTION
1	6 ft	100360 Moulding, Edge, Air Inlet
2	30 in	100365 Trim, Edge, .085 To .210 Thickness
3	15 ft	102004 D Seal, 1.00 X 1.00

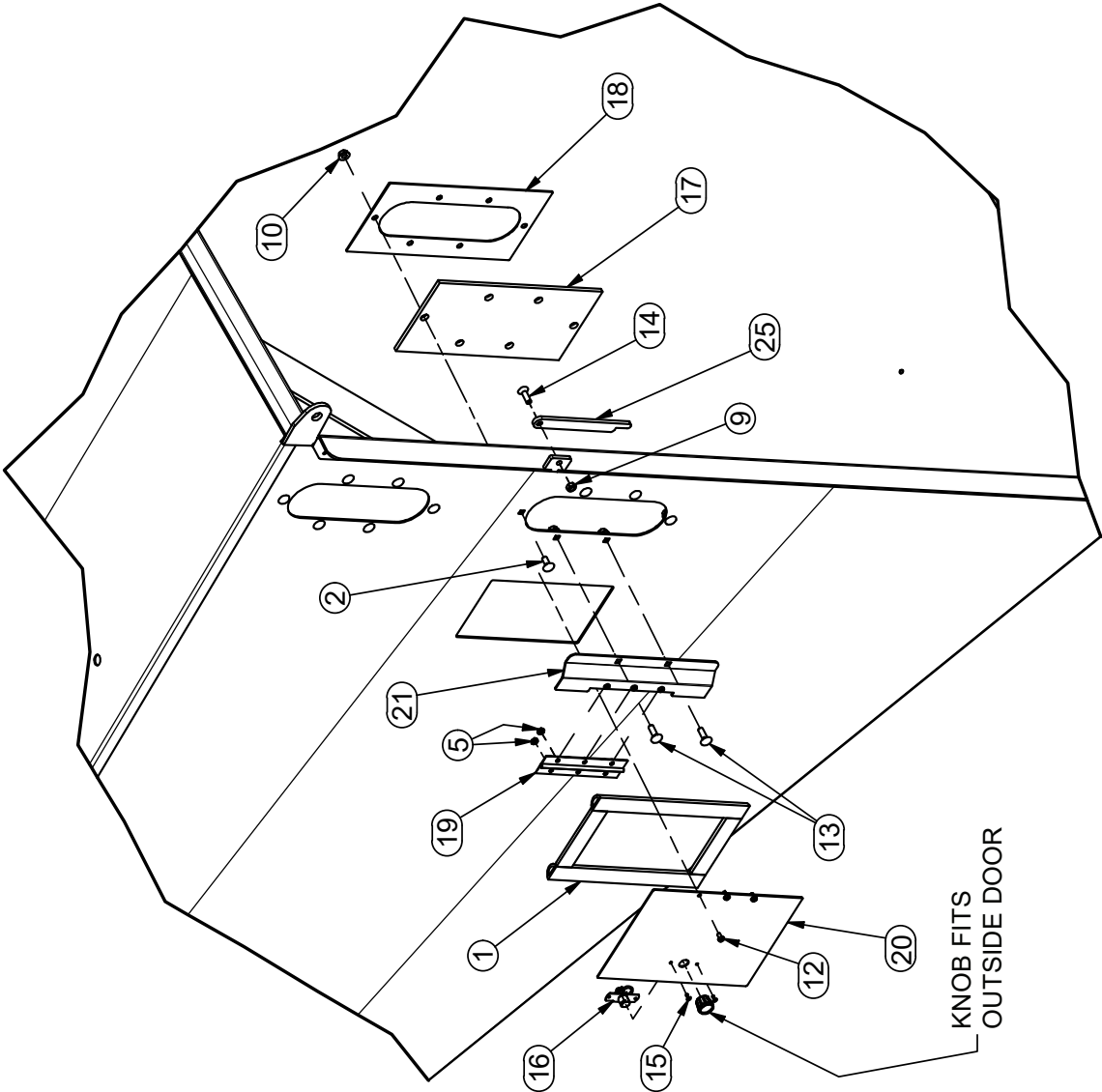
905135

REV: C

# HOPPER ASSEMBLY

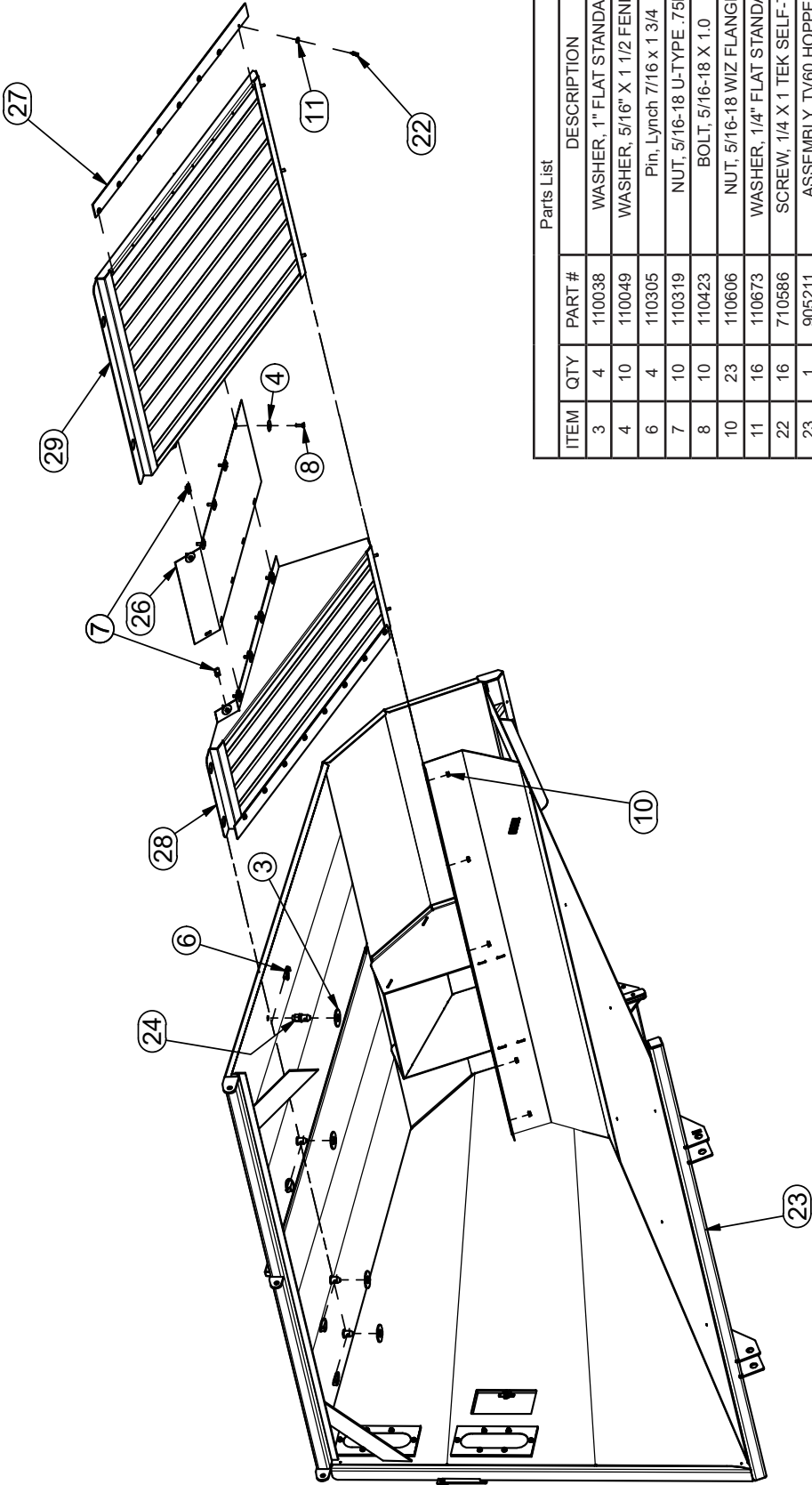
Parts List			
ITEM	QTY	PART #	DESCRIPTION
1	2/8"	102075	SEAL
2	16	110020	Bolt, 5/16-18 X 0.75 in Carriage
3	4	110038	WASHER, 1" FLAT STANDARD
4	10	110049	WASHER, 5/16" X 1 1/2 FENDER
5	6	110119	NUT, 10-24 LOCK
6	4	110305	Pin, Lynch 7/16 x 1 3/4
7	10	110319	NUT, 5/16-18 U-TYPE .75L
8	10	110423	BOLT, 5/16-18 X 1.0
9	1	110600	NUT, 5/16-18, UNITORQUE LOCK
10	23	110606	NUT, 5/16-18 WIZ FLANGE
11	16	110673	WASHER, 1/4" FLAT STANDARD
12	6	110788	BOLT, 10-24 X .375 STAINLESS, PHILLIPS
13	2	110871	Bolt, 5/16-18 X 1 in Carriage
14	1	110986	SCREW, 5/16-18 UNCX1 FH
15	2	112051	POP RIVET, 1/8 X .275
16	1	302131	LATCH, SPRING
17	3	311691	SIGHT GLASS, HOPPER
18	3	311692	Backing Plate, Sight Glass
19	2	311729	HINGE, 6" ALUMINUM W/ HOLES
20	1	317413	DOOR, HOPPER DEBRIS, US
21	1	317414	BRKT, HOPPER DEBRIS DOOR, US
22	16	710586	SCREW, 1/4 X 1 TEK SELF-TAP
23	1	905211	ASSEMBLY, TV60 HOPPER
24	4	942161	PIN, STABILIZER
25	1	970211	BAR, PROP
26	1	970366	MIDDLE SCREEN
27	2	970729	DEBRIS FLAP-RETURN SCREEN
28	1	975099	LEFT RETURN SCREEN
29	1	975100	RIGHT RETURN SCREEN

# SIGHT WINDOW INSTALLATION



Parts List		
ITEM	QTY	PART # DESCRIPTION
1	2/8"	102075 SEAL
2	16	110020 Bolt, 5/16-18 X 0.75 in Carriage
5	6	110119 NUT, 10-24 LOCK
9	1	110600 NUT, 5/16-18, UNITORQUE LOCK
10	23	110606 NUT, 5/16-18 WIZ FLANGE
12	6	110788 BOLT, 10-24 X .375 STAINLESS, PHILLIPS
13	2	110871 Bolt, 5/16-18 X 1 in Carriage
14	1	110986 SCREW, 5/16-18 UNC X1 FH
15	2	112051 POP RIVET, 1/8 X .275
16	1	302131 LATCH, SPRING
17	3	311691 SIGHT GLASS, HOPPER
18	3	311692 Backing Plate, Sight Glass
19	2	311729 HINGE, 6" ALUMINUM W/ HOLES
20	1	317413 DOOR, HOPPER DEBRIS, US
21	1	317414 BRKT, HOPPER DEBRIS DOOR, US
25	1	970211 BAR, PROP

# SCREEN INSTALLATION

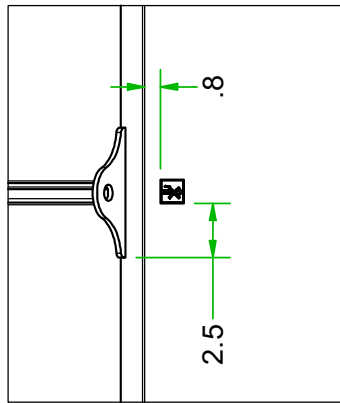


Parts List			
ITEM	QTY	PART #	DESCRIPTION
3	4	110038	WASHER, 1" FLAT STANDARD
4	10	110049	WASHER, 5/16" X 1 1/2 FENDER
6	4	110305	Pin, Lynch 7/16 x 1 3/4
7	10	110319	NUT, 5/16-18 U-TYPE .75L
8	10	110423	BOLT, 5/16-18 X 1.0
10	23	110606	NUT, 5/16-18 W/IZ FLANGE
11	16	110673	WASHER, 1/4" FLAT STANDARD
22	16	710586	SCREW, 1/4 X 1 TEK SELF-TAP
23	1	905211	ASSEMBLY, TV60 HOPPER
24	4	942161	PIN, STABILIZER
26	1	970366	MIDDLE SCREEN
27	2	970729	DEBRIS FLAP-RETURN SCREEN
28	1	975099	LEFT RETURN SCREEN
29	1	975100	RIGHT RETURN SCREEN

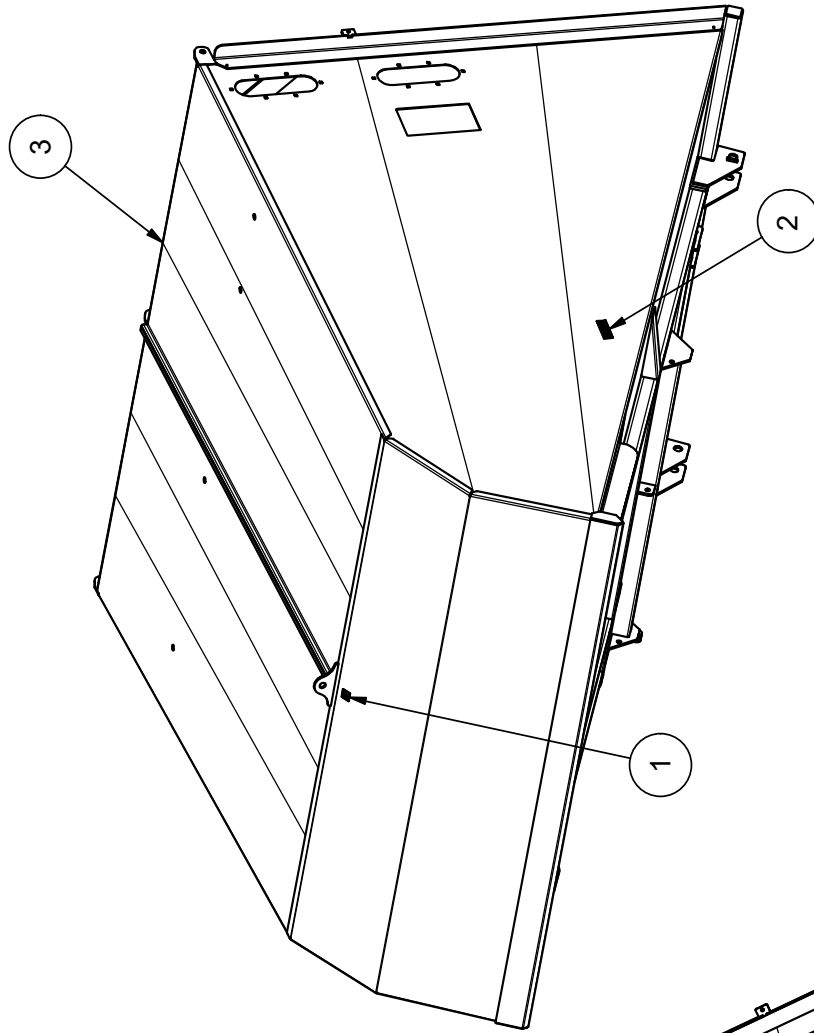


905211 REV: NC

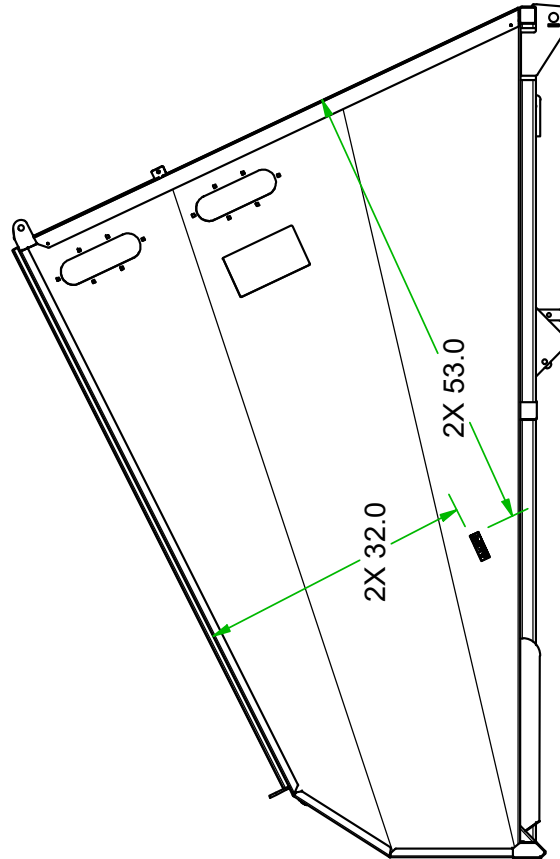
## TV60 HOPPER



902234 PLACEMENT

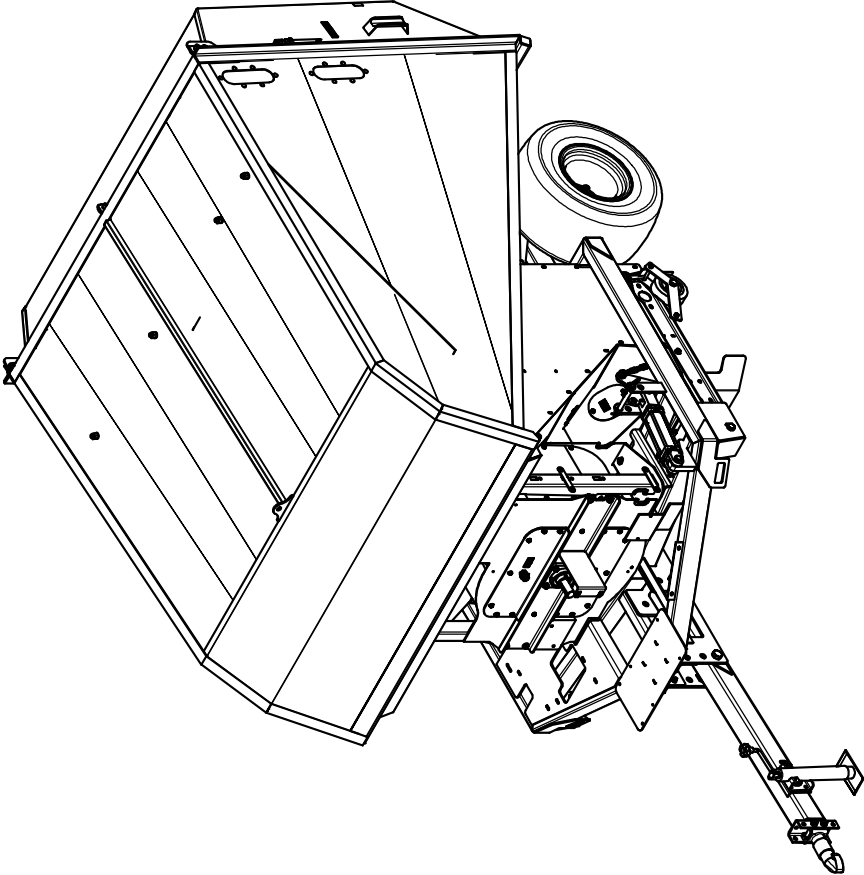


Parts List			
ITEM	QTY	PART #	DESCRIPTION
1	1	902234	Decal, No Lift
2	2	902245	Decal, Hopper Safety Lock
3	1	905211	Hopper w Decals



902245 PLACEMENT

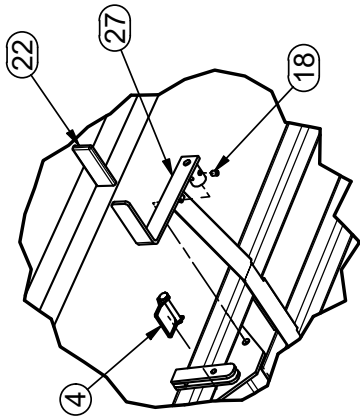
# HOPPER INSTALLATION



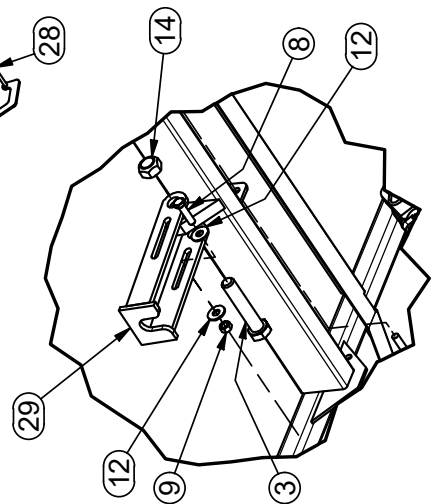
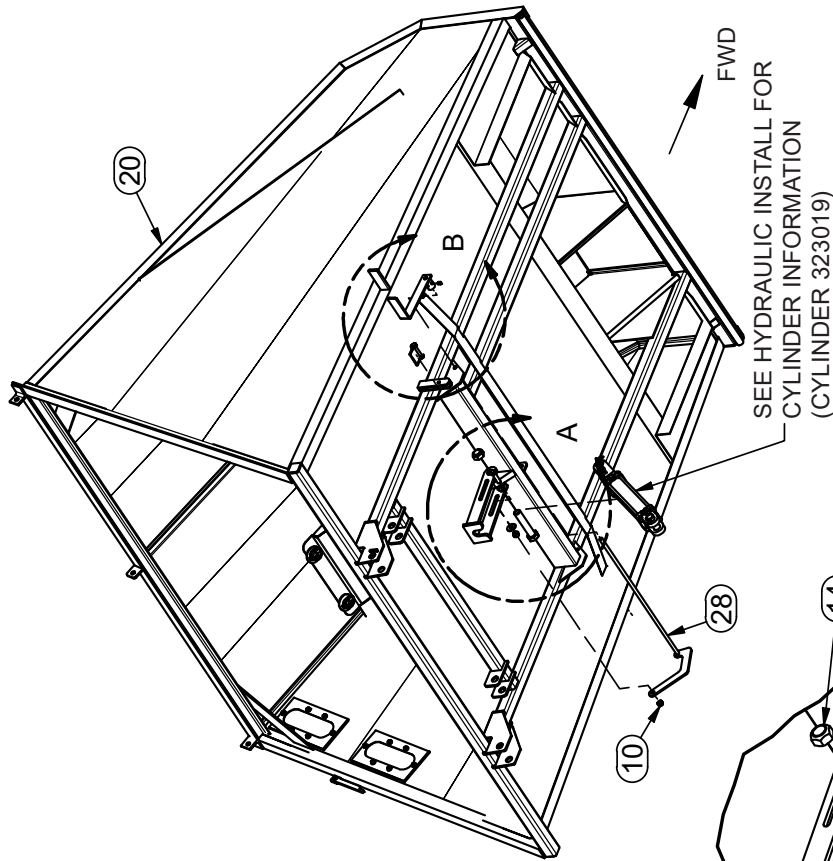
Parts List			
ITEM	QTY	PART #	DESCRIPTION
1	3	110026	BOLT, 5/8-11 X 1.25
2	2	110179	BOLT, 7/16-14 X 2.75
3	1	110208	BOLT, 1-8 X 5.0
4	1	110304	PIN, LOCK 3/8 X 2.5 SQ
5	2	110334	BOLT, 1-8 X 6.0
6	2	110336	WASHER, 1-1/4 FLAT MACHINE 10GA
7	2	110337	NUT, 7/16-14 WIZ FLANGE
8	1	110379	BOLT, 1/2-13 X 2.0
9	1	110610	NUT, 1/2-13
10	1	110615	NUT, 1/2-13, UNITORQUE LOCK
11	3	110639	NUT, 5/8-11, UNITORQUE LOCK
12	2	110658	WASHER, 1/2" FLAT STANDARD
13	2	110670	WASHER, 7/16" FLAT STANDARD
14	3	111226	NUT, 1-8, UNITORQUE LOCK
15	2	210326	CLIP, HAIRPIN
16	2	220480	PIN
17	3	315257	PIN WELDMENT, HOPPER DOOR
18	2	510161	SetScrew, 3/8-16 X 0.5
19	2	510174	GREASE ZERK, 1/4-28 ST
20	1	905135	ASSEMBLY, TV60RE HOPPER
21	1	905136	ASSEMBLY, TV60 DOOR
22	1	910044	COVER, VINYL .25 X 1.5 X 4 GRIP
23	2	970148	HOPPER DOOR LATCH
24	2	970149	LATCH PIVOT BUSHING
25	2	970150	LATCH SPACER
26	2	970151	LATCH PIVOT SPACER
27	1	975055	HANDLE WELDMENT, DUMP CYL LOCK
28	1	975056	SHAFT WELDMENT, DUMP CYL LOCK
29	1	975057	STOP WLDMNT, CYLINDER LOCK

# LIFT LOCK INSTALLATION

905137 REV. C



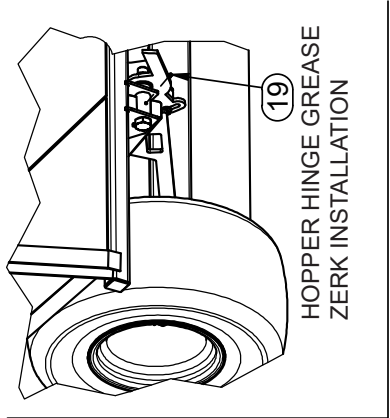
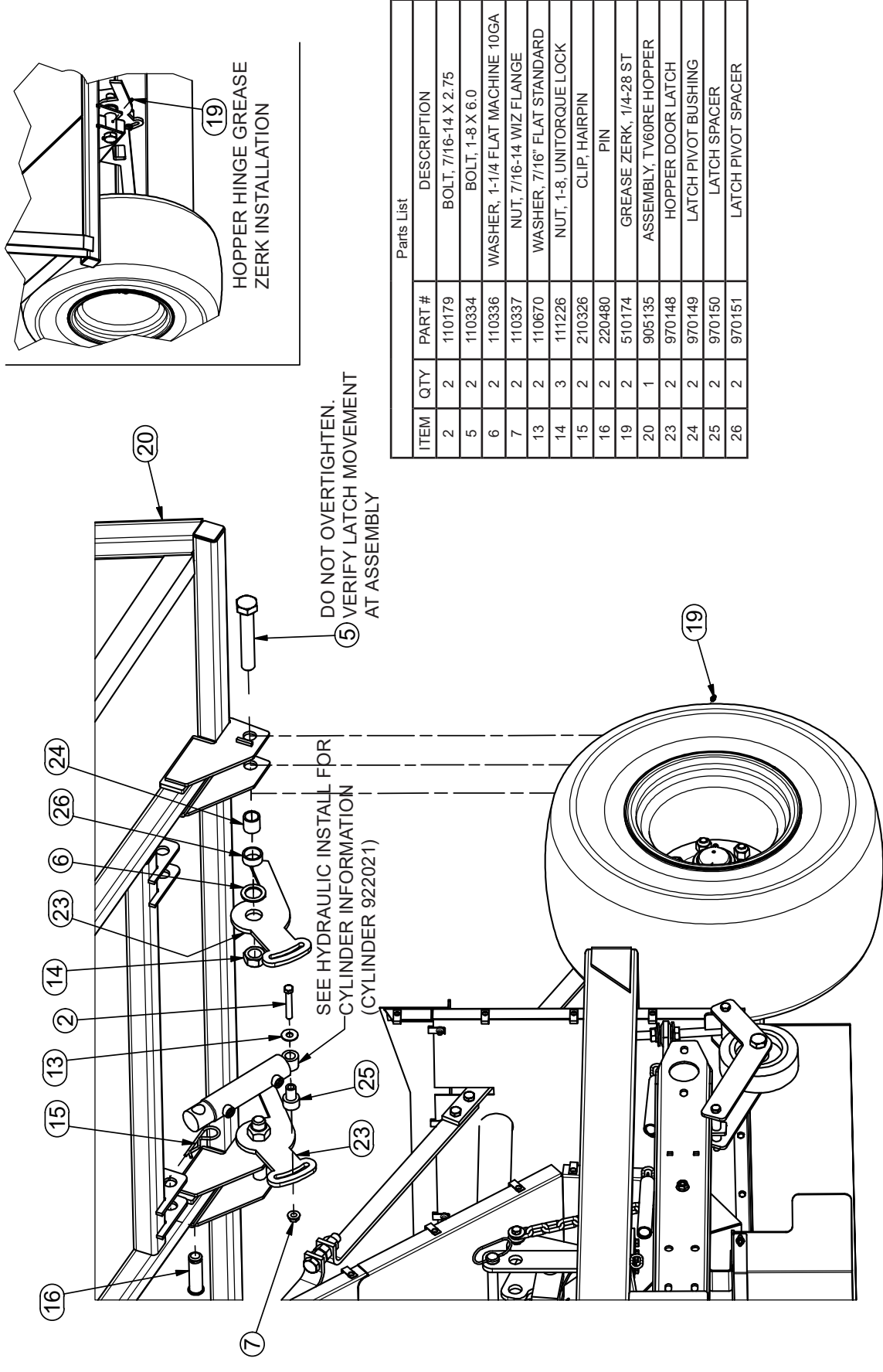
DETAIL B



DETAIL A

Parts List		
ITEM	QTY	PART # DESCRIPTION
3	1	110208 BOLT, 1-8 X 5.0
4	1	110304 PIN, LOCK 3/8 X 2.5 SQ
8	1	110379 BOLT, 1/2-13 X 2.0
9	1	110610 NUT, 1/2-13
10	1	110615 NUT, 1/2-13, UNITORQUE LOCK
12	2	110658 WASHER, 1/2" FLAT STANDARD
14	3	111226 NUT, 1-8, UNITORQUE LOCK
18	2	510161 SetScrew, 3/8-16 X 0.5
20	1	905135 ASSEMBLY, TV60RE HOPPER
22	1	910044 COVER, VINYL .25 X 1.5 X 4 GRIP
27	1	975055 HANDLE WELDMENT, DUMP CYL LOCK
28	1	975056 SHAFT WELDMENT, DUMP CYL LOCK
29	1	975057 STOP WLDMNT, CYLINDER LOCK

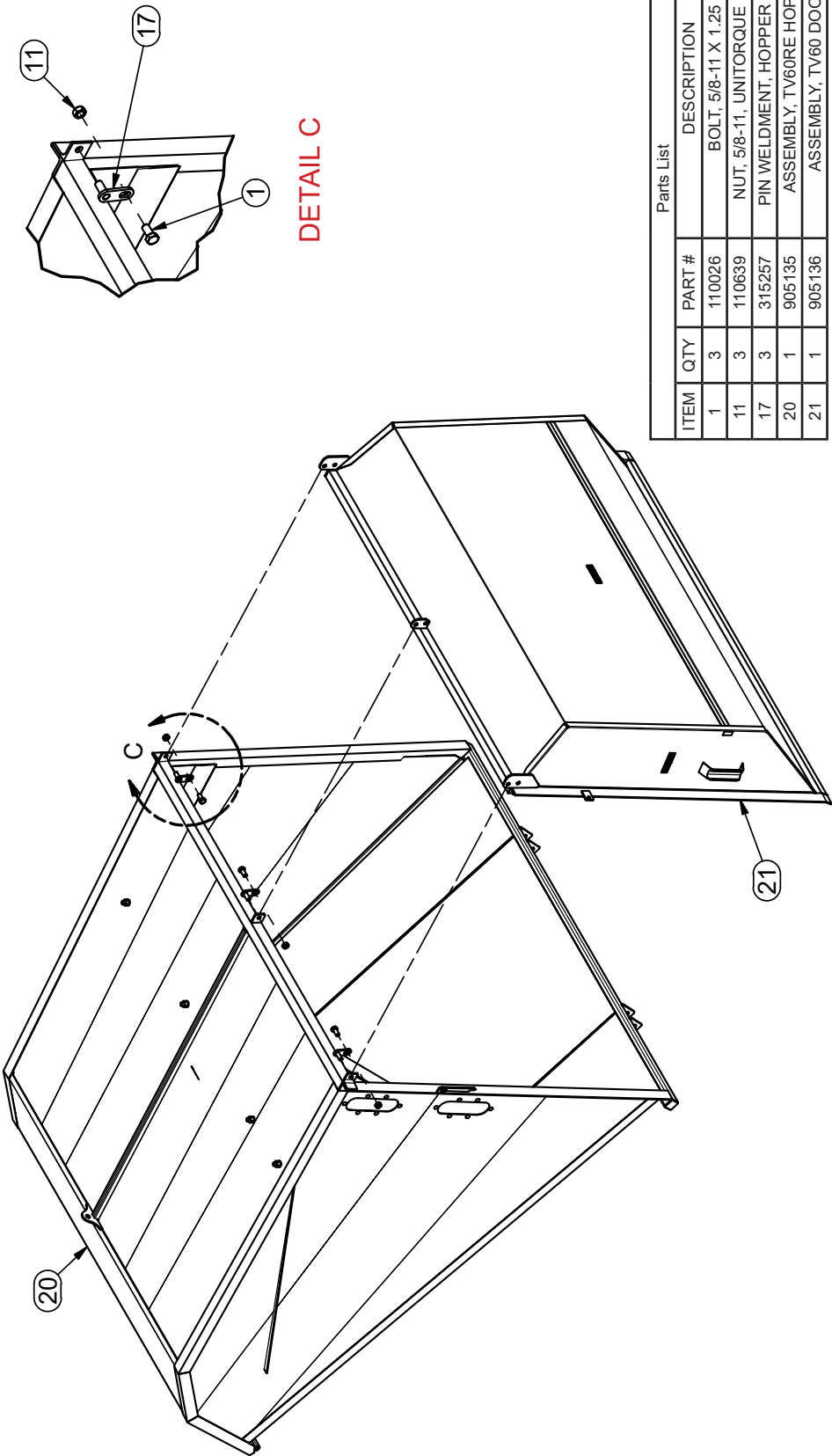
DOOR LATCH INSTALLATION



Parts List		
ITEM	QTY	PART #
2	2	110179
5	2	110334
6	2	110336
7	2	110337
13	2	110670
14	3	111226
15	2	210326
16	2	220480
19	2	510174
20	1	905135
23	2	970148
24	2	970149
25	2	970150
26	2	970151

DESCRIPTION
BOLT, 7/16-14 X 2.75
BOLT, 1-8 X 6.0
WASHER, 1-1/4 FLAT MACHINE 10GA
NUT, 7/16-14 WIZ FLANGE
WASHER, 7/16" FLAT STANDARD
NUT, 1-8, UNITORQUE LOCK
CLIP, HAIRPIN
PIN
GREASE ZERK, 1/4-28 ST
ASSEMBLY, TV60RE HOPPER
HOPPER DOOR LATCH
LATCH PIVOT BUSHING
LATCH SPACER
LATCH PIVOT SPACER

DOOR INSTALLATION



Parts List			
ITEM	QTY	PART #	DESCRIPTION
1	3	110026	BOLT, 5/8-11 X 1.25
11	3	110639	NUT, 5/8-11, UNITORQUE LOCK
17	3	315257	PIN WELDMENT, HOPPER DOOR
20	1	905135	ASSEMBLY, TV60RE HOPPER
21	1	905136	ASSEMBLY, TV60 DOOR



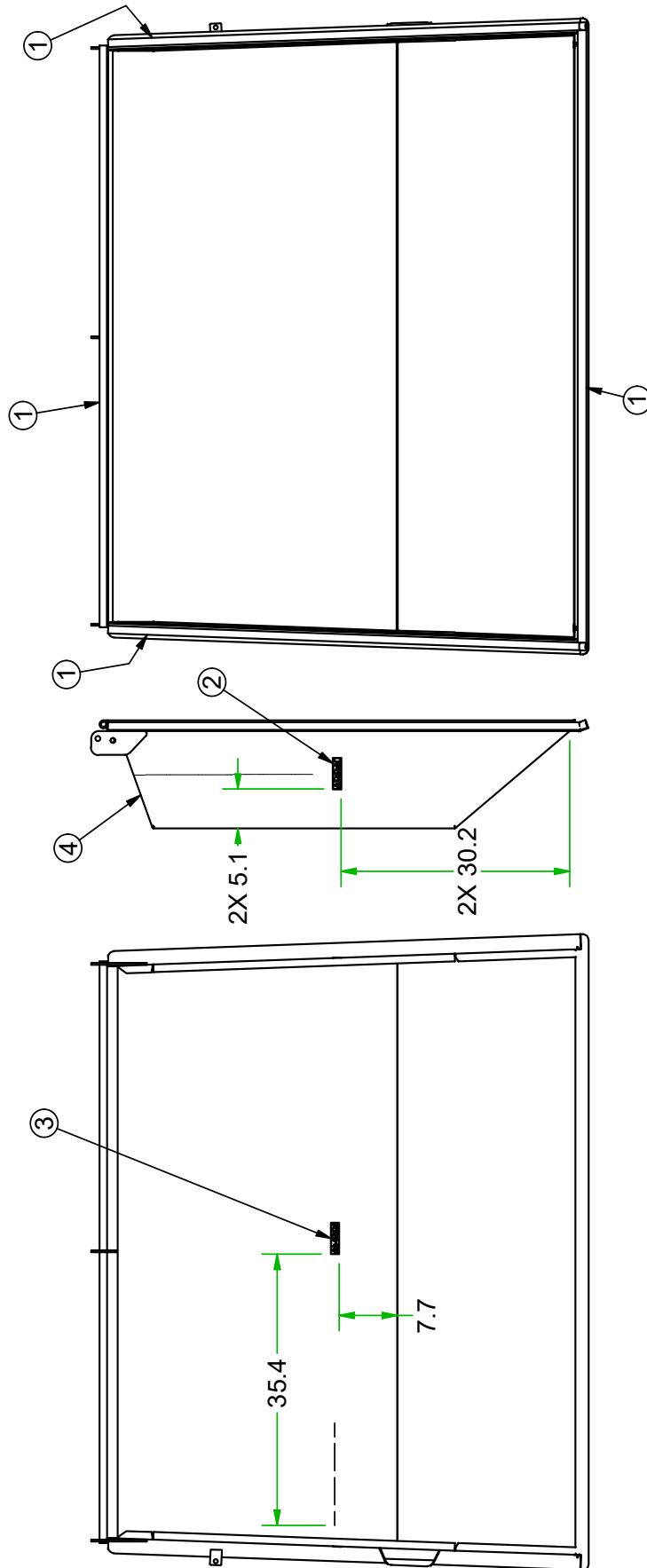
# TV60 HOPPER DOOR

905136

REV: C

Parts List		
Item	Qty	Part
1	24	102004
2	2	902226
3	1	902233
4	1	905136
Door w Decals		

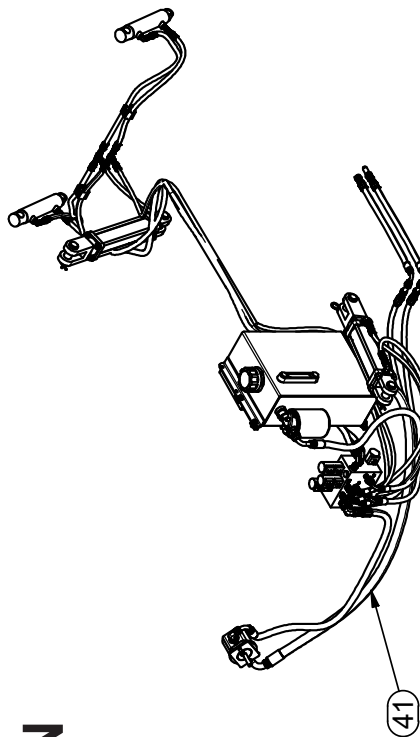
DESCRIPTION	
D-Seal, Rubber 1.00" x 1.00"	
Decal, Hopper Crushing	
Decal, Hopper Crushing	
Door w Decals	



Parts List				Parts List				Parts List				905134	REV: G
ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION		
1	4	110319	NUT, 5/16-18 U-TYPE .75L	15	3	120102	ADAPTER, BULKHEAD, 6MJ-6MJ	29	1	323019	CYLINDER - 2 X 8, SAE-6		
2	1	110377	BOLT, 5/16-18 X 1-1/2	16	1	120138	ADAPTER, 10MJ-12MP	30	1	500175	PIPE PLUG, 1/2" SQ HEAD PLAIN		
3	2	110441	BOLT, 5/16-18 X 4.0	17	3	120222	ADAPTER, 6MJ-8MB90	31	2	522104	DOUBLE HOSE CLAMP		
4	4	110444	BOLT, 5/16-18 X 0.75, WIZ FLANGE	18	1	120227	ADAPTER, 12BH-12MP	32	2	522105	DOUBLE COVERPLATE		
5	2	110474	BOLT, 1/4-20 X 1-1/2	19	2	120233	ADAPTER, 4MJ-4MB	33	1	720041	FILTER HEAD		
6	2	110606	NUT, 5/16-18 WIZ FLANGE	20	2	120235	ADAPTER, 4MJ-4MB90	34	1	720043	FILTER, 10 MICRON		
7	2	110608	NUT, 5/16-18	21	2	120239	ADAPTER, 6MJ-8MB	35	1	720077	FITTING, NIPPLE 3/4 X 1.375		
8	1	110665	WASHER, 5/16" FLAT STANDARD	22	2	120241	ADAPTER, 4MJ-4MJ-4MJ	36	1	920006	PUMP, .31"cid X 1/2" HALDEX W600		
9	2	110667	WASHER, 1/4" LOCK	23	1	120277	ADAPTER, 8MJ-8MB	37	2	922021	HYDRAULIC CYLINDER		
10	2	110674	WASHER, 5/16" LOCK	24	1	120288	ADAPTER, 8MJ-8MB90	38	1	923001	BREATHER/FILLER CAP		
11	1	111164	Bolt, 5/16-18 X 1.5 in Carriage	25	6	120319	ADAPTER, 6MJ-6MB	39	1	923006	VALVE, 4 BANK, TV60 W/O NEEDLE		
12	1	112008	CLAMP, 1.25", T-BOLT	26	1	120368	ADAPTER, 8MJ-8FJX90	40	1	923011	Cylinder, 2 X 6, -6 SAE Cross		
13	6	112056	Screw, 10-32 X 1/2, Hex Washer Hd, SS	27	1	120389	ADAPTER, 12MJ-10MB45	41	1	925010	Hose Kit, TV60RE		
14	1	120030	ADAPTER, 10MJ-12MB90	28	1	120551	ADAPTER, 6MJ-6MB90 R.062	42	1	970879	Pump Mount Spacer		
								43	1	973004	Hydraulic Tank Assembly		

## TV60RE HYDRAULIC INSTALLATION

925010 - Hose Assemblies Parts List	
QTY	DESCRIPTION
1	Pump Suction
2	Deck Motor
1	Hopper Lift
2	Broom Arm to Motor
4	Door Latch
2	Deck Lift
1	Hopper Lower
1	Valve "T" to Filter
2	Door Latch
1	Pump Pressure



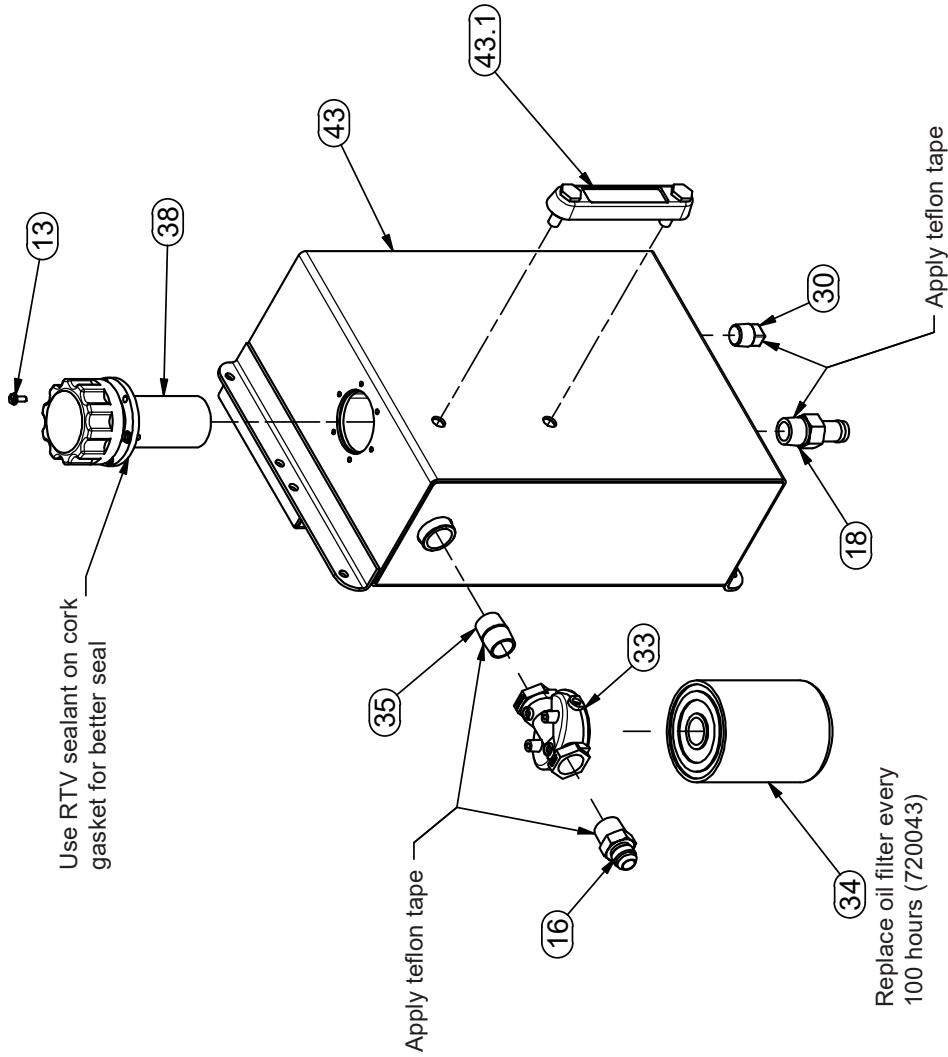
Fitting perpendicular  
with shaft



Fitting perpendicular  
with shaft

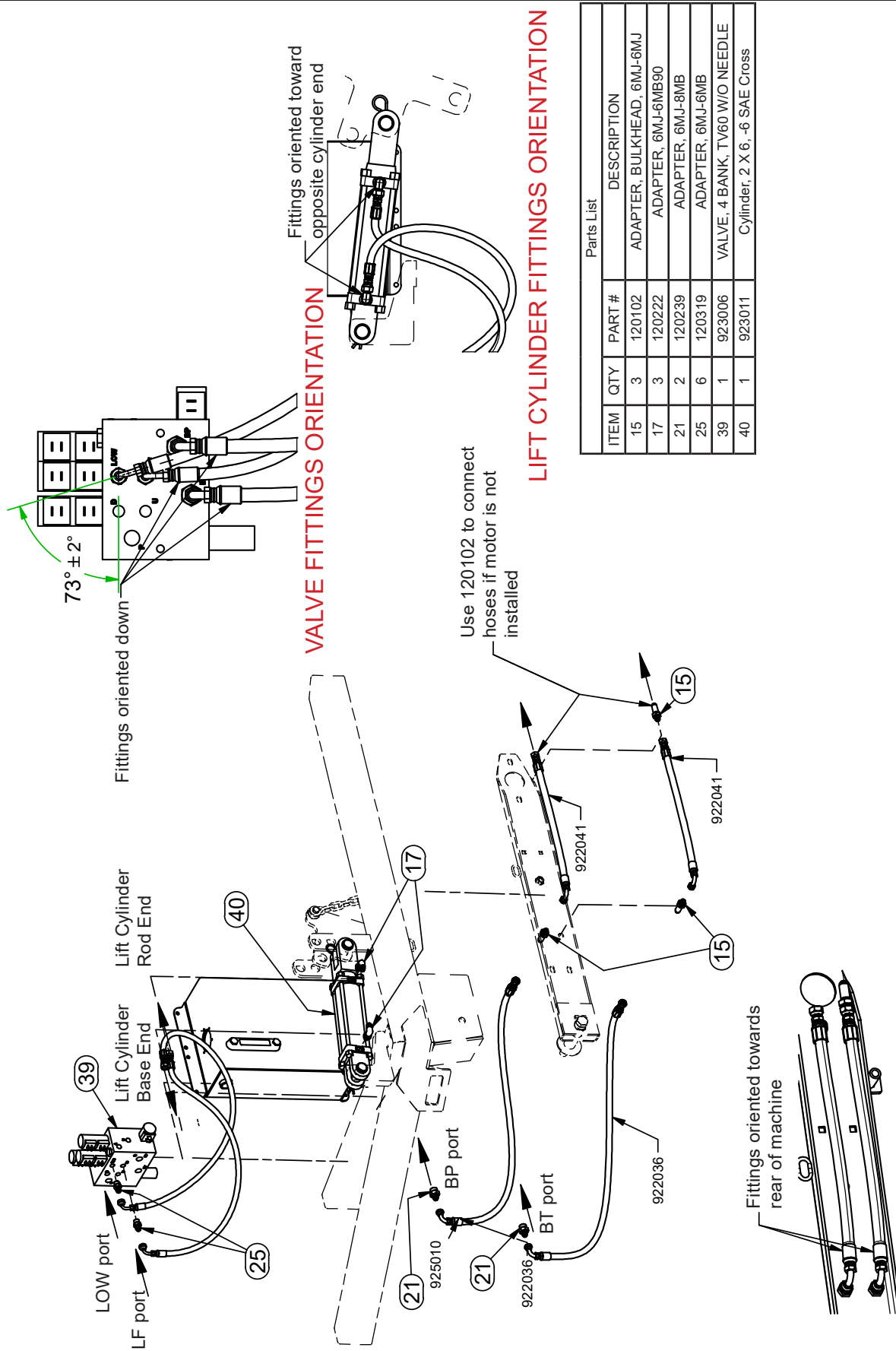
Fitting perpendicular  
with shaft

# HYDRAULIC RESERVOIR



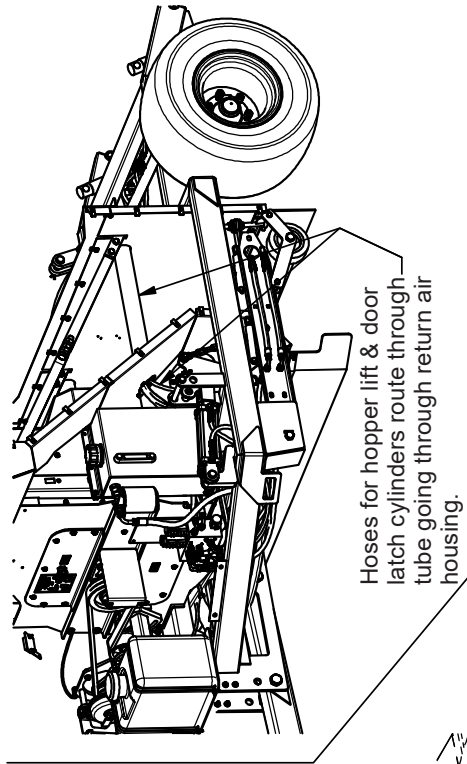
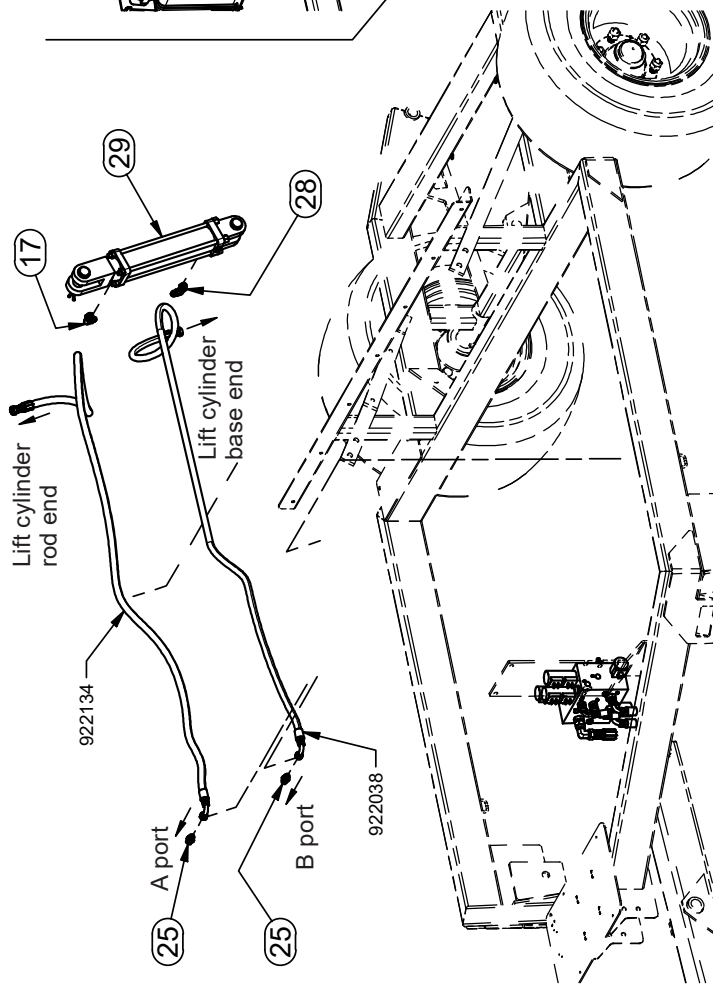
Parts List		
ITEM	QTY	PART # DESCRIPTION
13	6	112056 Screw, 10-32x1/2, Hex Washer Hd, Ss
16	1	120138 Adapter, 10mj-12mp
18	1	120227 Adapter, 12bh-12mp
30	1	500175 Pipe Plug, 1/2" Sq Head Plain
33	1	720041 Filter Head
34	1	720043 Filter, 10 Micron
35	1	Fitting, Nipple 3/4 X 1.375
38	1	923001 Breather/Filler Cap
43	1	973004 Hydraulic Tank Assembly, Tv60
43.1	1	922142 Sight Glass, Hydraulic Tank

# BROOM HYDRAULIC ASSEMBLY

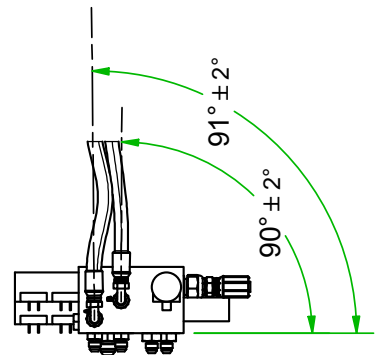
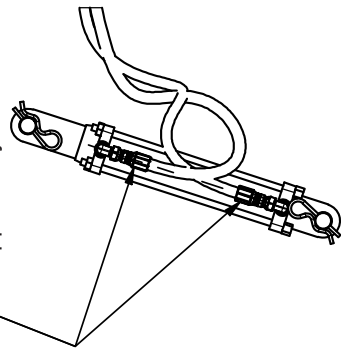


# HOPPER LIFT HYDRAULICS

905134 REV: G



Fittings oriented toward opposite cylinder end



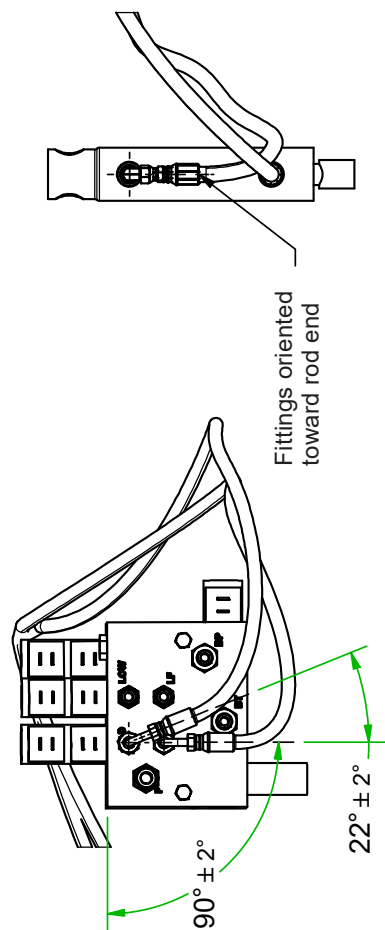
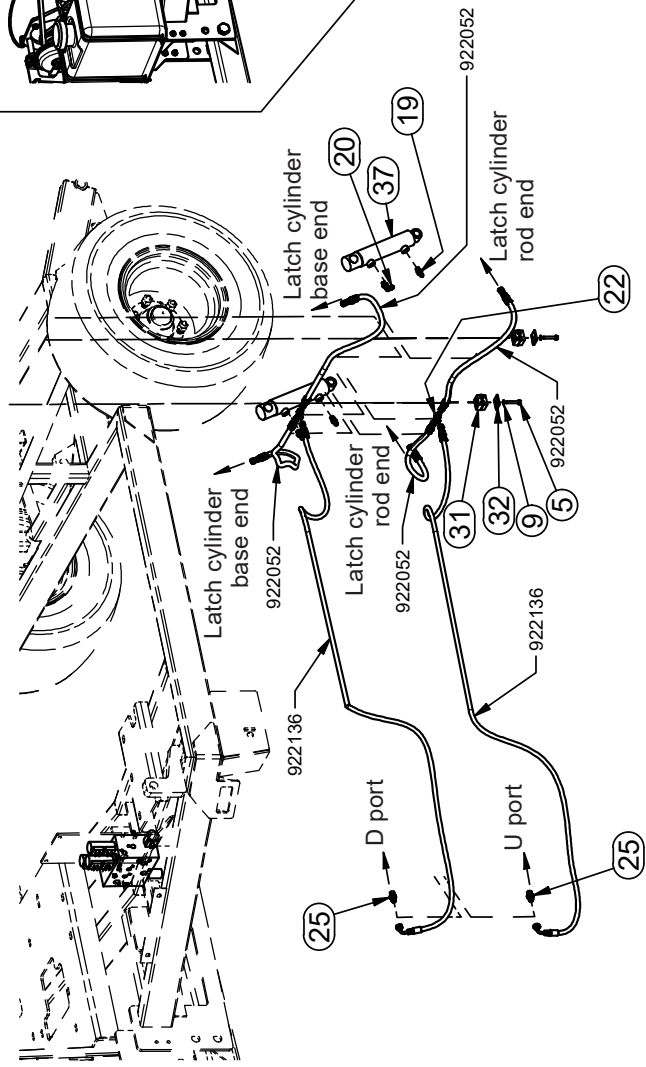
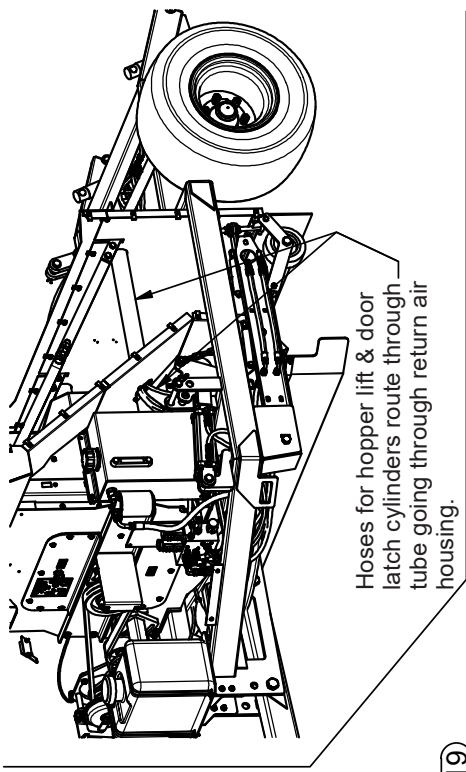
Parts List			
ITEM	QTY	PART #	DESCRIPTION
17	3	120222	ADAPTER, 6MJ-6MB90
25	6	120319	ADAPTER, 6MJ-6MB
28	1	120551	ADAPTER, 6MJ-6MB90 R.062
29	1	323019	CYLINDER - 2 X 8, SAE-6

CYLINDER FITTINGS ORIENTATION

VALVE FITTINGS ORIENTATION



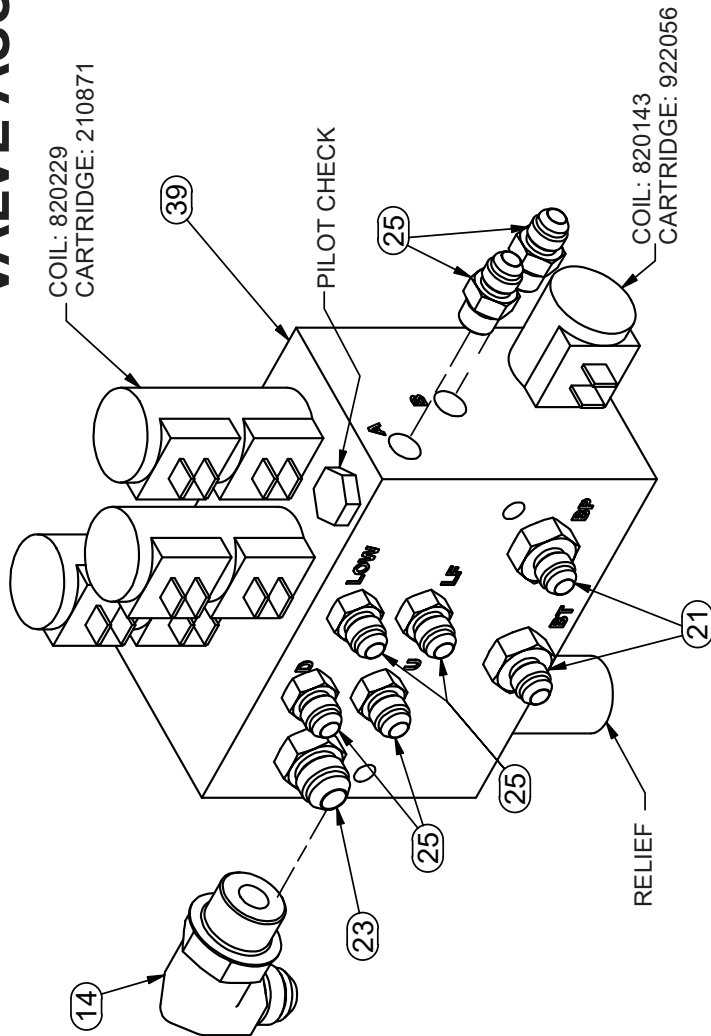
# HOPPER DOOR LATCH HYDRAULICS



Parts List		
ITEM	QTY	PART # DESCRIPTION
5	2	110474 Bolt, 1/4-20 X 1-1/2
9	2	110667 Washer, 1/4" Lock
19	2	120233 Adapter, 4mj-4mb
20	2	120235 Adapter, 4mj-4mb90
22	2	120241 Adapter, 4mj-4mj-4mj
25	6	120319 Adapter, 6mj-6mb
31	2	522104 Double Hose Clamp
32	2	522105 Double Coverplate
37	2	922021 Hydraulic Cylinder

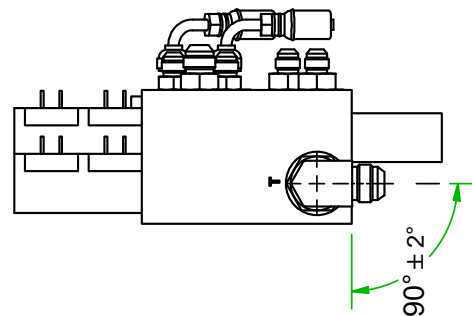
VALVE FITTINGS ORIENTATION LATCH CYLINDER FITTINGS ORIENTATION

# VALVE ASSEMBLY



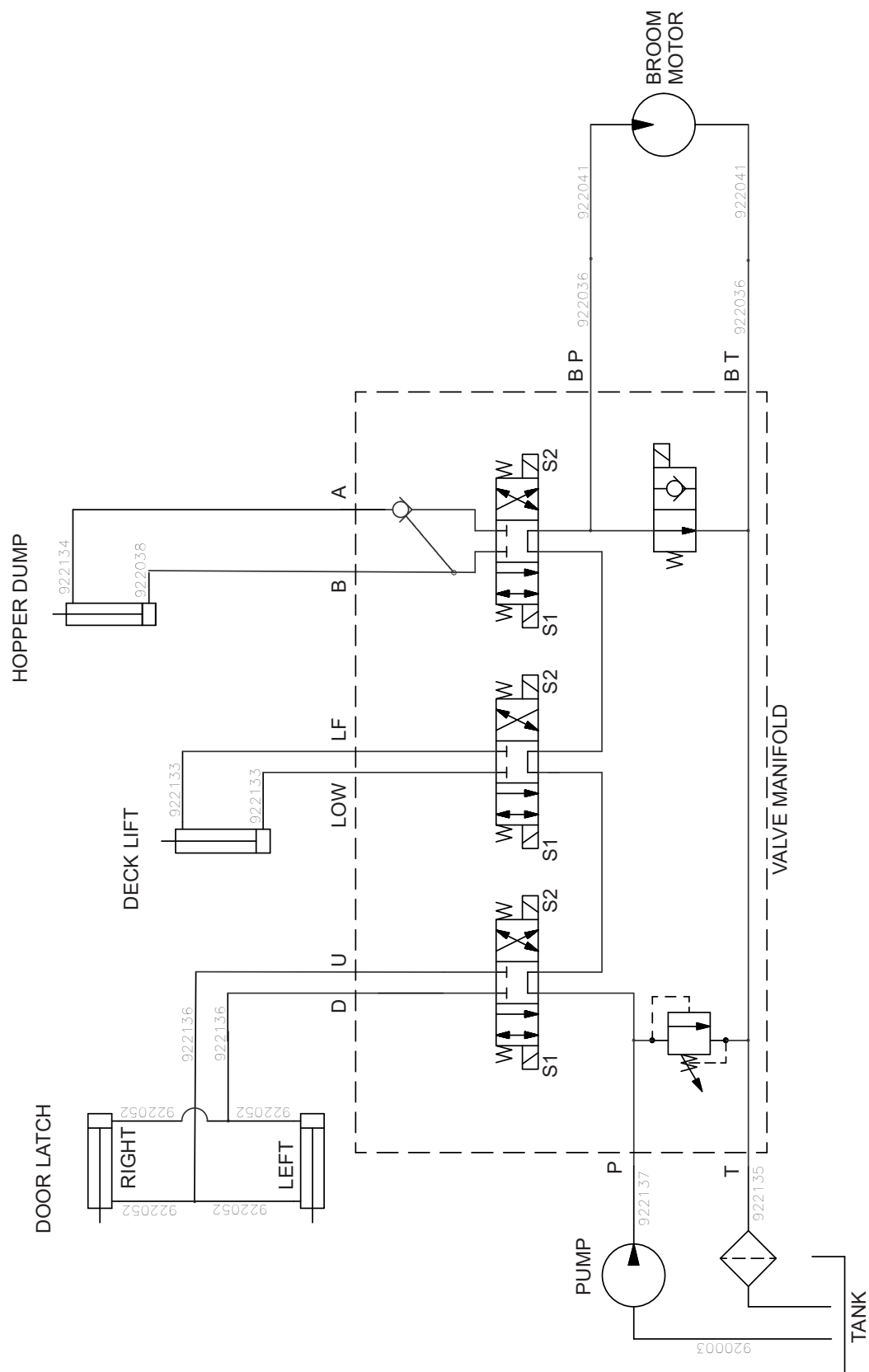
923006 Valve Parts		
QTY	PART #	DESCRIPTION
3	210871	Valve Cartridge
1	820143	Coil, 12 Volt
6	820229	Coil Deck Valve, Spade Connector
1	922055	Valve, Relief 2000#
1	922056	Valve, Spool
1	922072	Valve, Pilot Check

Parts List		
ITEM	QTY	DESCRIPTION
14	1	ADAPTER, 10MJ-12MB90
21	2	ADAPTER, 6MJ-8MB
23	1	ADAPTER, 8MJ-8MB
25	6	ADAPTER, 6MJ-6MB
39	1	VALVE, 4 BANK, TV60 W/O NEEDLE



**FITTINGS ORIENTATION**

# HYDRAULIC SCHEMATIC



Parts List				Parts List				Parts List				905138	REV: L
ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION		
1	7	100361	Clamp, Hose #4 .25 Mini	27	2	110709	Screw, 10-24 X 0.75, Rhms	51	1	942063	Pulley, 2 Groove Qd Bushing		
2	79"	100644	Hose, 1/4" Low Perm	28	2	110466	Nut Whiz 10-24nc Zp	52	1	942067	Bushing, Sk 1 1/2		
3	50"	100708	Hose, 3/16" Low Perm	29	4	110067	Bolt, 3/8-16 X 2.0 Fhcs 82°	53	1	942167	Idle Pulley Assy		
4	2	110012	Bolt, 7/16-14 X 4.5	30	2	111198	Bolt, 5/16-18 X 9.5 Zinc Full Thread	54	1	942187	Belt, Gates A33		
5	2	110168	Bolt, 5/16-18 X 2.0 Shcs	31	1	111272	<b>Washer, 7/16 Nord Lock</b>	55	1	942188	Sheave, 1a4.5 X 1 1/8kss		
6	2	110254	Bolt, 7/16-14 X 1.25, Wiz Flange	32	1	132014	Insulator Cap. (Alternator)	*56	1		Belt, Powerband 2/B76 (See Below)		
7	5	110290	Nut, 1/4-20 Wiz Flange	33	1	132069	Battery Terminal Cover, Positive	*57	1		Engine, Kohler, Efi (See Below)		
8	2	110319	Nut, 5/16-18 U-Type .75l	34	1	132070	Battery Terminal Cover, Negative	58	1	952030	Primer Bulb, Carb		
9	2	110337	Nut, 7/16-14 Wiz Flange	35	1	200019	Clamp, Adel Ac10 .265 Hole	59	2	970284	Spacer, .75 X .50 X 2.75		
10	4	110402	<b>Bolt, 3/8-16 x 1.25 in Carriage</b>	36	1	411120	Key, 3/8 X 3/8 X 2.25	60	1	970509	Spacer, 1.625 X 1.13 X 1.00		
11	2	110423	Bolt, 5/16-18 X 1.0	37	1	510228	Key, 1/4 X 1/4 X 1.0 Under	61	2	970529	Spacer		
12	2	110429	Bolt, 1/2-13 X 1.5	38	1	530051	Cable, Battery To Ground	62	1	970548	Belt Guard, Bracket R		
13	1	110433	Bolt, 3/8-16 X .75	39	1	832011	Battery, Sealed Gel W/ L Terminal	63	1	970680	Clutch Bracket		
14	1	110443	<b>Bolt, 7/16-20 X 2.75</b>	40	1	900278	Spacer, 1.75x1.25x.313	64	1	970785	Plate, Pump Mount AA		
15	5	110468	Bolt, 1/4-20 X 0.75, Wiz Flange	41	1	902162	Fuel Tank Assy, 6 Gal	65	1	970825	Mount - Tac, Kohler		
16	2	110539	Bolt, 7/16-14 X 1.25	42	2	902163	Strap, Hold Down	66	1	970876	Brtk, Battery Hold Down		
17	1	110562	Bolt, 5/8-11 X 4.5	43	1	902256	Carbon Canister 650cc	*67	1		Plate, Engine Mount (See Below)		
18	4	110606	Nut, 5/16-18 Wiz Flange	44	2	902257	650cc Carbon Canister Bracket	68	1	975117	Tensioner Weldment		
19	2	110608	Nut, 5/16-18	45	1	932065	Clutch, Electric						
20	1	110639	Nut, 5/8-11, Unitorque Lock	46	1	932061	Harness, Engine/Remote Tv60e						
21	9	110645	Nut, 3/8-16 Wiz Flange	47	1	932062	Cable, Battery, 4ga 96" W/Ring						
22	1	110658	Washer, 1/2" Flat Standard	48	1	932070	Tach/Hour Meter, Kohler						
23	2	110665	Washer, 5/16" Flat Standard	49	1	940127	Bushing, Taperlock 1610 .531 Bore						
24	2	110666	Washer, 1/2" Lock	50	1	942027	Sheave, 1a5.6/B6.0 -1610 TI						
25	5	110671	Washer, 7/16" Lock										
26	4	110674	Washer, 5/16" Lock										

**ENGINE INSTALLATION**

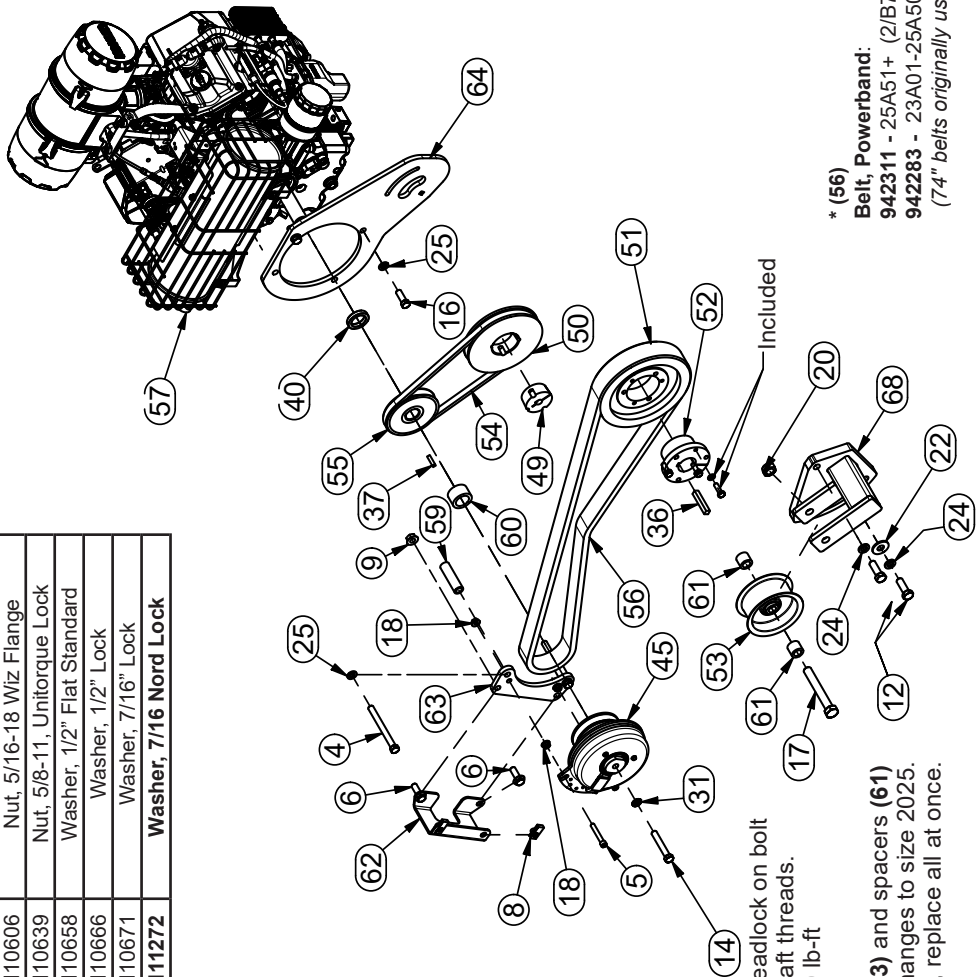
(57)  
Kohler:  
943054 - 23.5 HP (PA-ECH730-3092)  
22A15 & earlier  
22A36 & 22A99  
23A06 & 23A99  
24A11 & 24A38  
943061 - 26.5 HP (ECH749-3059)  
22A16-22A35  
23A01-23A05  
943062 - 26.5 HP (ECH749-3138) CARB  
24A01 & 24A10  
24A39+

(56)  
Belt, Powerband:  
942311 - 25A51+ (2/B76)  
942283 - 23A01-25A50 (2/B75)  
(74" belts originally used and were too tight)

(67)  
Plate, Engine Mount  
970962 - 25A51+  
970873 - 23A01-25A50

Parts List				Parts List				Parts List			
ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION
4	2	110012	Bolt, 7/16-14 X 4.5	36	1	411120	Key, 3/8 X 3/8 X 2.25	54	1	942187	Belt, Gates A33
5	2	110168	Bolt, 5/16-18 X 2.0 Shos	37	1	510228	Key, 1/4 X 1/4 X 1.0 Under	55	1	942188	Sheave, 1a4.5 X 1 1/8kss
6	2	110254	Bolt, 7/16-14 X 1.25, Wiz Flange	40	1	900278	Spacer, 1.75x1.25x.313	*56	1		Belt, Powerband 2/B76 (See Below)
8	2	110319	Nut, 5/16-18 U-Type .75l	45	1	932065	Clutch, Electric	*57	1		Engine, Kohler, Efi (See Below)
9	2	110337	Nut, 7/16-14 Wiz Flange	49	1	940127	Bushing, Taperlock 1610 .531 Bore	59	2	970284	Spacer, .75 X .50 X 2.75
12	2	110429	Bolt, 1/2-13 X 1.5	50	1	942027	Sheave, 1a5.6/B6.0 -1610 TI	60	1	970509	Spacer, 1.625 X 1.13 X 1.00
<b>14</b>	<b>1</b>	<b>110443</b>	<b>Bolt, 7/16-20 X 2.75</b>	51	1	942063	Pulley, 2 Groove Qd Bushing	61	2	970529	Spacer
16	2	110539	Bolt, 7/16-14 X 1.25	52	1	942067	Bushing, Sk 1 1/2	62	1	970548	Belt Guard, Bracket R
17	1	110562	Bolt, 5/8-11 X 4.5	53	1	942167	Idler Pulley Assy	63	1	970680	Clutch Bracket
18	4	110606	Nut, 5/16-18 Wiz Flange					64	1	970785	Plate, Pump Mount AA
20	1	110639	Nut, 5/8-11, Unitorque Lock					68	1	975117	Tensioner Weldment
22	1	110658	Washer, 1/2" Flat Standard								
24	2	110666	Washer, 1/2" Lock								
25	5	110671	Washer, 7/16" Lock								
<b>31</b>	<b>1</b>	<b>111272</b>	<b>Washer, 7/16 Nord Lock</b>								

## ENGINE ASSEMBLY



Use blue threadlock on bolt and crankshaft threads.  
Torque to 50 lb-ft

Idler pulley (53) and spacers (61) had slight changes to size 2025. If necessary, replace all at once.

\* (56)  
Belt, Powerband:  
942311 - 25A51+ (2/B76)  
942283 - 23A01-25A50 (2/B75)  
(74" belts originally used and were too tight) at midpoint when 7lb is applied

## BELT TENSION INSTRUCTION

CLUTCH: Belt (56) should deflect 1/2" at midpoint when 7lb is applied

PUMP: Belt (54) should deflect 1/4" at midpoint when 7lb is applied

(57)  
Kohler:  
943054 - 23.5 HP (PA-ECH730-3092)  
22A15 & earlier  
22A36 & 22A99  
23A06 & 23A99  
24A11 & 24A38  
943061 - 26.5 HP (ECH749-3059)  
22A16-22A35  
23A01-23A05  
943062 - 26.5 HP (ECH749-3138) CARB  
24A01 & 24A10  
24A39+

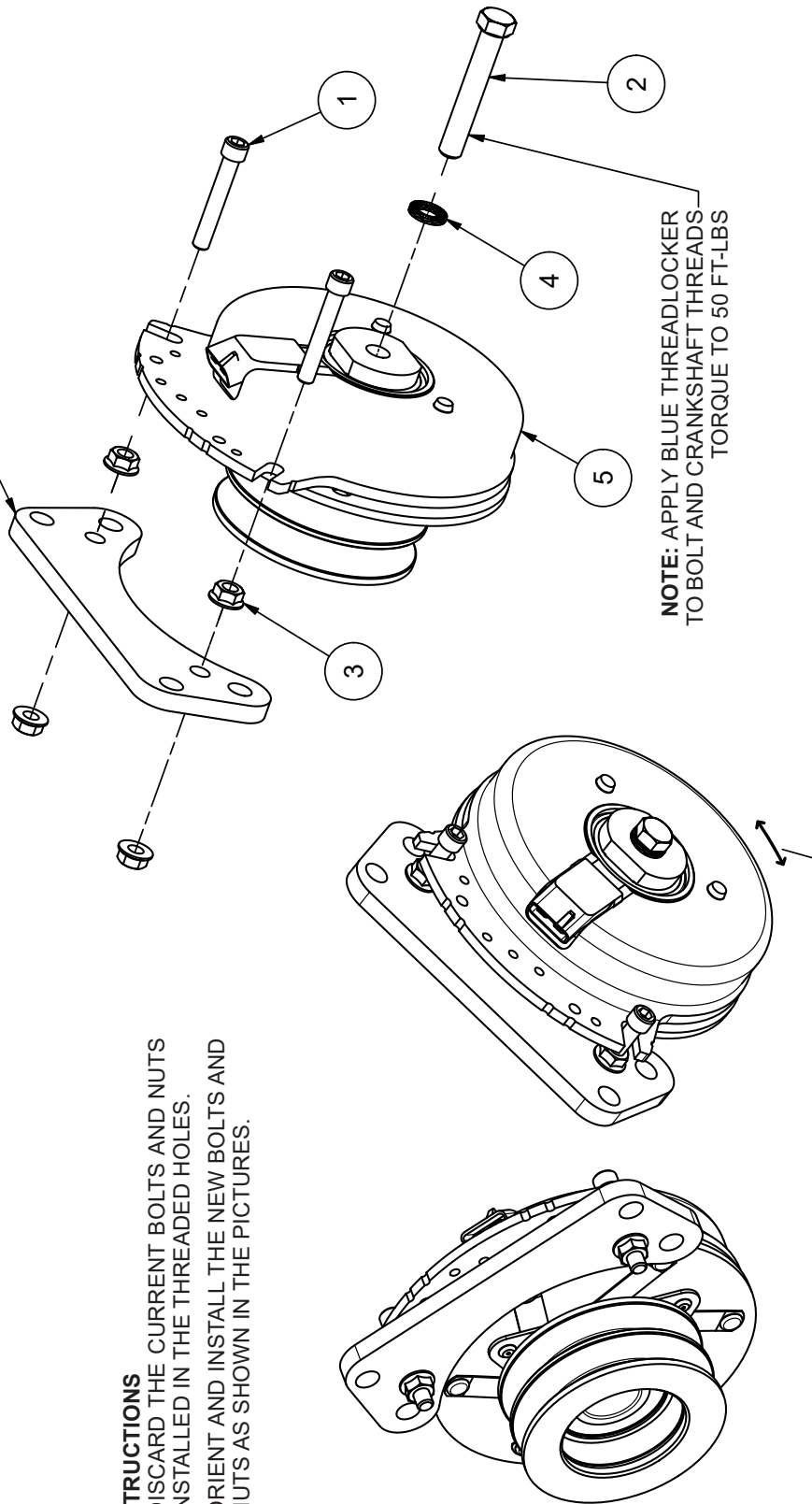
# ELECTRIC CLUTCH REPLACEMENT KIT

ALL SERIAL NUMBERS

## INSTRUCTIONS

1. DISCARD THE CURRENT BOLTS AND NUTS INSTALLED IN THE THREADED HOLES.
2. ORIENT AND INSTALL THE NEW BOLTS AND NUTS AS SHOWN IN THE PICTURES.

NOTE: BRACKET NOT INCLUDED

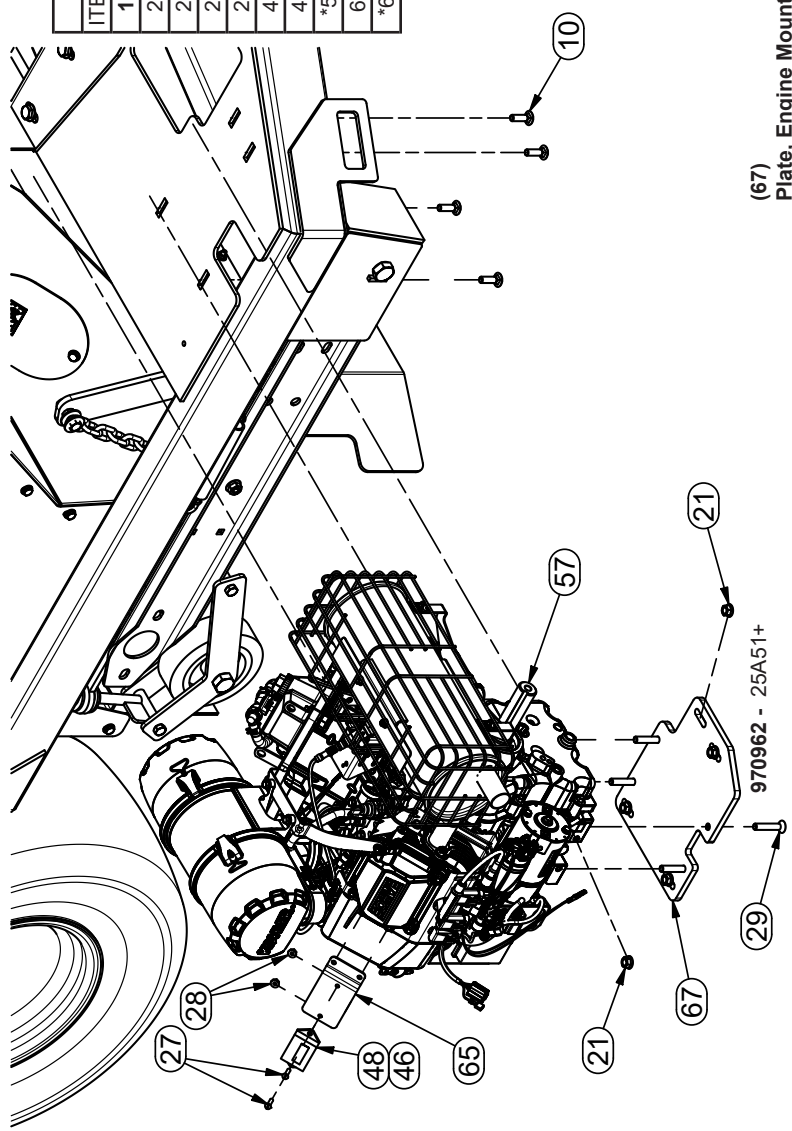


**NOTE:** AFTER INSTALLATION IS COMPLETE, ENSURE THAT THE CLUTCH HOUSING CAN SLIGHTLY ROTATE FREELY ABOUT IT'S CENTER AXIS (MOVE BACK & FORTH). THIS WILL PREVENT THE CLUTCH FROM BINDING.

Parts List			DESCRIPTION
ITEM	QTY	PART #	
1	2	110168	BOLT, 5/16-18 X 2.0 SHCS
2	1	110443	BOLT, 7/16-20 X 2.75
3	4	110606	NUT, 5/16-18 W/IZ FLANGE
4	1	111272	WASHER, 7/16, NORD LOCK
5	1	932018	CLUTCH, ELECTRIC



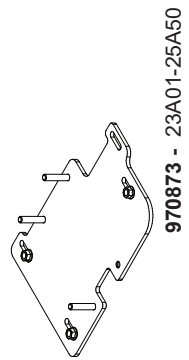
# ENGINE INSTALLATION

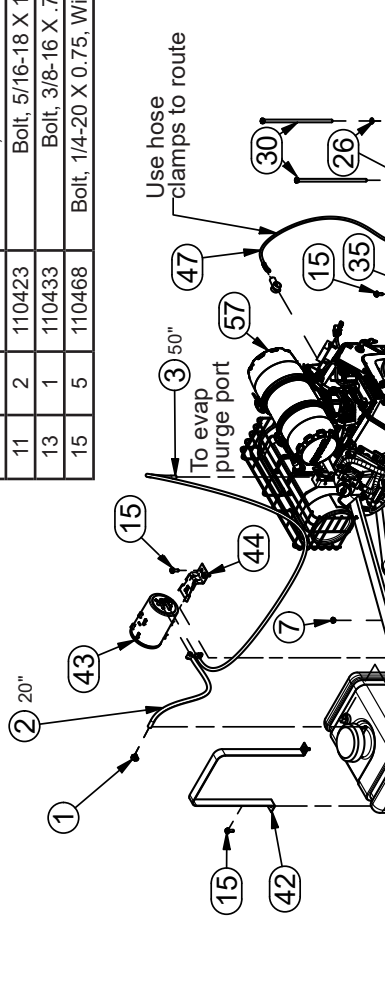


Parts List			DESCRIPTION
ITEM	QTY	PART #	
10	4	110402	Bolt, 3/8-16 x 1.25 in Carriage
21	9	110645	Nut, 3/8-16 W/ Flange
27	2	110709	Screw, 10-24 X 0.75, Rhms
28	2	111046	Nut Whiz 10-24nc Zp
29	4	111067	Bolt, 3/8-16 X 2.0 Fhcs 82°
46	1	932061	Harness, Engine/Remote Tv60e
48	1	932070	Tach/Hour Meter, Kohler
*57	1		Engine, Kohler, Efi (See Below)
65	1	970825	Mount - Tac, Kohler
*67	1		Plate, Engine Mount (See Below)

(67)  
**Plate, Engine Mount**  
970962 - 25A51+  
970873 - 23A01-25A50

(57)  
**Kohler:**  
943054 - 23.5 HP (PA-ECH730-3092)  
22A15 & earlier  
22A36 & 22A99  
23A06 & 23A99  
24A11 & 24A38  
943061 - 26.5 HP (ECH749-3059)  
22A16-22A35  
23A01-23A05  
943062 - 26.5 HP (ECH749-3138) CARB  
24A01 & 24A10  
24A39+



Parts List				Parts List			
ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION
1	7	100361	Clamp, Hose #4 .25 Mini	19	2	110608	Nut, 5/16-18
2	79"	100644	Hose, 1/4" Low Perm	21	9	110645	Nut, 3/8-16 W/iz Flange
3	50"	100708	Hose, 3/16" Low Perm	23	2	110665	Washer, 5/16" Flat Standard
7	5	110290	Nut, 1/4-20 W/iz Flange	26	4	110674	Washer, 5/16" Lock
11	2	110423	Bolt, 5/16-18 X 1.0	30	2	111198	Bolt, 5/16-18 X 9.5 Zinc Full Thread
13	1	110433	Bolt, 3/8-16 X .75	33	1	132069	Battery Terminal Cover, Positive
15	5	110468	Bolt, 1/4-20 X 0.75, W/iz Flange	34	1	132070	Battery Terminal Cover, Negative
<div>Use hose clamps except on engine evap port</div> 				35	1	200019	Clamp, Adel Ac10 .265 Hole
				38	1	530051	Cable, Battery To Ground
				39	1	832011	Battery, Sealed Gel W/ L Terminal
				41	1	902162	Fuel Tank Assy, 6 Gal
				42	2	902163	Strap, Hold Down
				43	1	902256	Carbon Canister 650cc
				44	2	902257	650cc Carbon Canister Bracket
				47	1	932062	Cable, Battery, 4ga 96" W/Ring
				57	1		Engine, Kohler, Efi (See Below)
				58	1	952030	Primer Bulb, Carb
				66	1	970876	Brkt, Battery Hold Down

# ENGINE FUEL EMISSIONS & ELECTRICAL INSTALLATION

- (57)

Kohler:

943054 - 23.5 HP (PA-ECH730-3092)

22A15 & earlier

22A36 & 22A99

23A06 & 23A99

24A11 & 24A38
- 943061 - 26.5 HP (ECH749-3059)

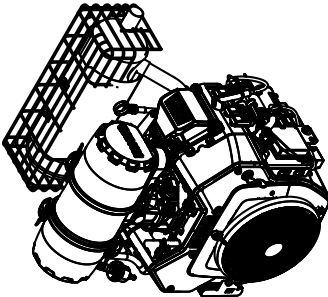
22A16-22A35

23A01-23A05
- 943062 - 26.5 HP (ECH749-3138) CARB

24A01 & 24A10

24A39+

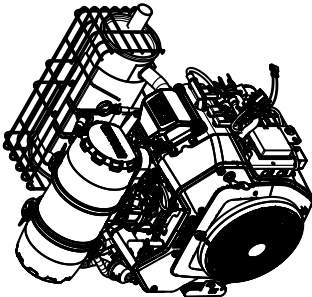
**943054** - Kohler 23.5 HP EFI  
 22A15 & earlier  
 22A36 & 22A99  
 23A06 & 23A99  
 24A11 & 24A38



PA-ECH730-3092

Service Parts	
PART #	DESCRIPTION
840027	Air Filter Element
932008	Solenoid Kit
932019	Solenoid
932070	Tach/Hour Meter, Kohler
932079	Ignition Switch
942068	Exhaust Deflector
942271	Muffler Guard Assembly
942298	Muffler Kit
942301	Fuel Filter

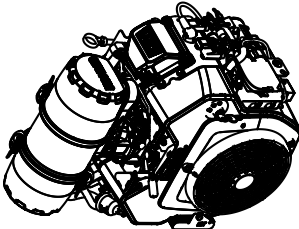
**943062** - Kohler 26.5 HP EFI CARB  
 24A01 & 24A10  
 24A39+



ECH749-3138

Service Parts	
PART #	DESCRIPTION
840027	Air Filter Element
932008	Solenoid Kit
932019	Solenoid
932070	Tach/Hour Meter, Kohler
932079	Ignition Switch
942068	Exhaust Deflector
942271	Muffler Guard Assembly
942298	Muffler Kit
942301	Fuel Filter

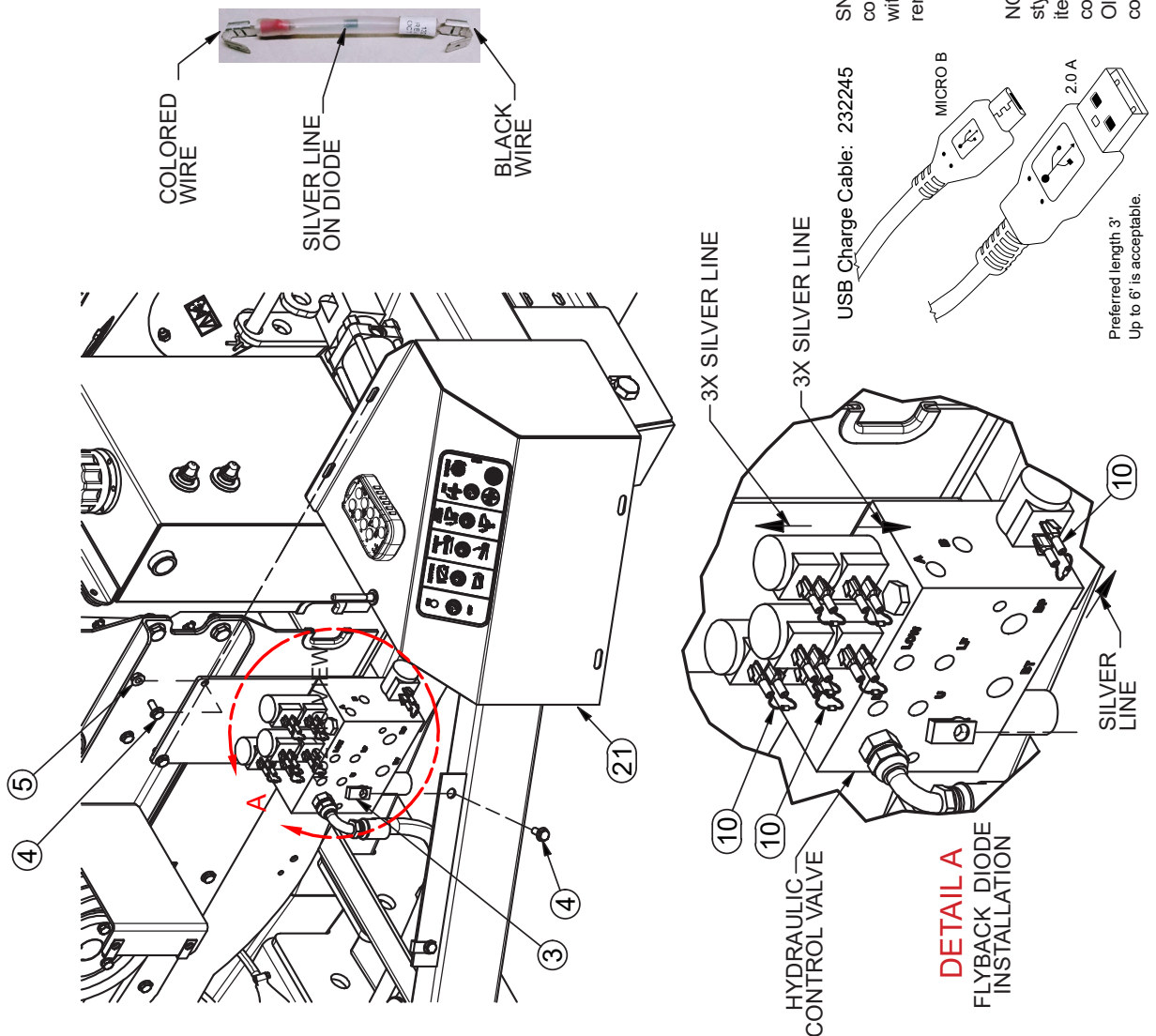
**943061** - Kohler 26.5 HP EFI  
 22A16-22A35  
 23A01-23A05



ECH749-3059

Service Parts	
PART #	DESCRIPTION
840027	Air Filter Element
932008	Solenoid Kit
932019	Solenoid
932070	Tach/Hour Meter, Kohler
932079	Ignition Switch
942068	Exhaust Deflector
942271	Muffler Guard Assembly
942298	Muffler Kit
942301	Fuel Filter

# ELECTRONICS INSTALLATION



COLORED WIRE

SILVER LINE ON DIODE

BLACK WIRE

SN: 25A49+ come standard with the 2.4GHz remote systems.

NOTE: New style remote items are NOT compatible with Old style remote components.

905139 REV: B

## Parts List

ITEM	QTY	PART #	DESCRIPTION
1	4	110119	NUT, 10-24 LOCK
2	1	110174	NUT, 1/4-20, UNITORQUE LOCK
3	2	110319	NUT, 5/16-18 U-TYPE .75L
4	4	110444	BOLT, 5/16-18 X 0.75, WIZ FLANGE
5	2	110606	NUT, 5/16-18 WIZ FLANGE
6	1	110815	SCREW, 1/4-20X3/4 PHILLIPS PAN HEAD
7	1	110967	GROMMET, RUBBER 7/16 ID X 3/4 OD
8	1	130012	CLAMP, ADELAC28 .265 HOLE
9	5	132035	SWITCH BOOT
10	7	132110	Flyback Diode Assembly
11	2	230038	TERMINAL, MALE PUSH ON, 16-14ga
12	4	510960	SCREW, 10-24 X 0.5, RHMS
13	2	530007	TOGGLE SWITCH
14	3	530020	SWITCH, SPDT-MOMENTARY
15	2	530111	RELAY
16	1	532059	LIGHT, INDICATOR, LED
17	1	902089	DECAL, SWITCHES TV60R E
18	1	902161	DECAL, TV 60 WIRING SCHEMATIC
19	1	932058	Harness, Receiver TV60
20	1	935025	TRANSMITTER/RECEIVER, Kar-Tech
21	1	975116	SHIELD - VALVE, WELDMENT

935015 Kar-Tech Upgrade Kit (Field Install)		
QTY	PART #	DESCRIPTION
7	132110	Flyback Diode Assembly
1	333006	Transmitter/Receiver, 2.4 Ghz
1	905070	Bolt Kit, Elect Assy Tv60r H
1	932058	Harness, Receiver Tv60
1	932061	Harness, Engine/Remote Tv60e
1	970288	Relay Bracket

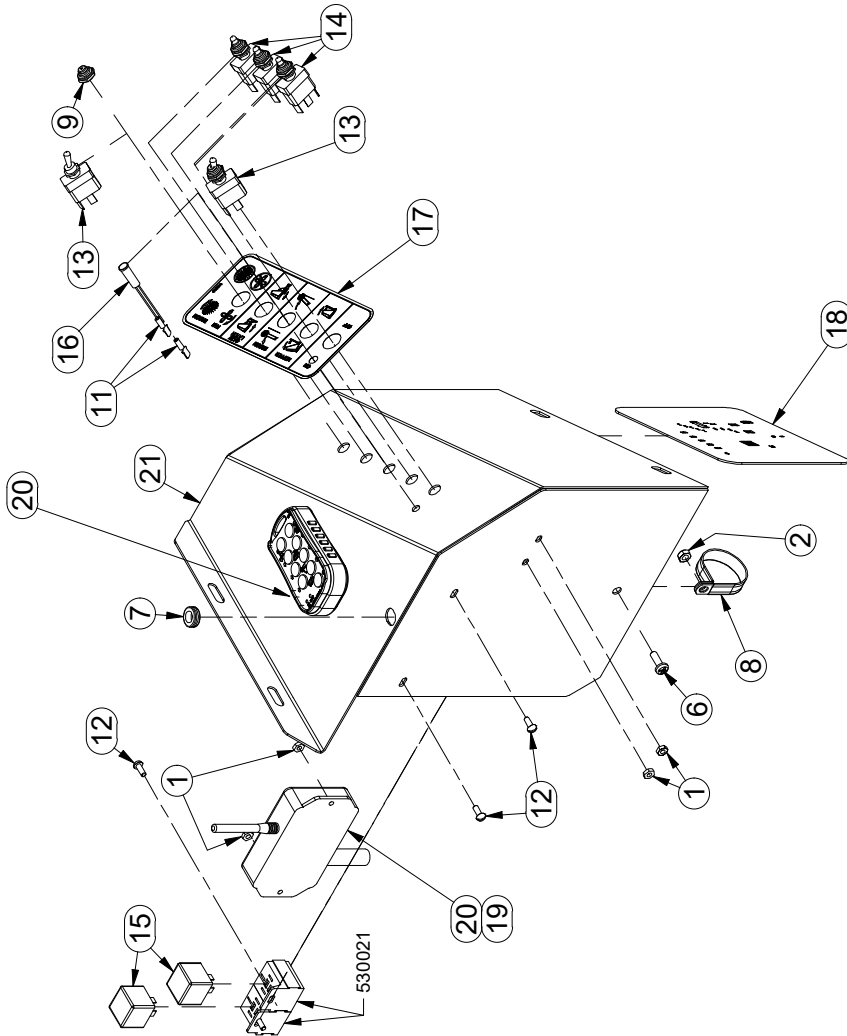
NEW 2.4 GHz 935025 Kar-Tech Transmitter / Receiver		
QTY	PART #	DESCRIPTION
1	332075	Receiver, 2.4 GHz
1	935029	Transmitter, 2.4 GHz
1	902249	Decal, 2.4 GHz

OLD STYLE 933003 Kar-Tech Transmitter / Receiver		
QTY	PART #	DESCRIPTION
1	932056	Receiver
1	233004	Transmitter
1	902158	Decal

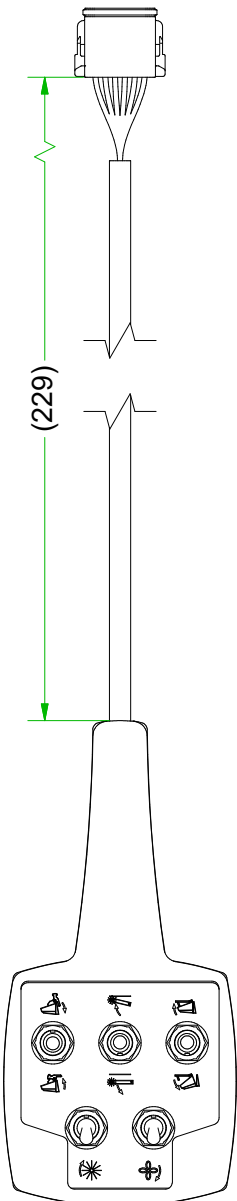
905139

REV: B

# CONTROL PANEL ASSEMBLY

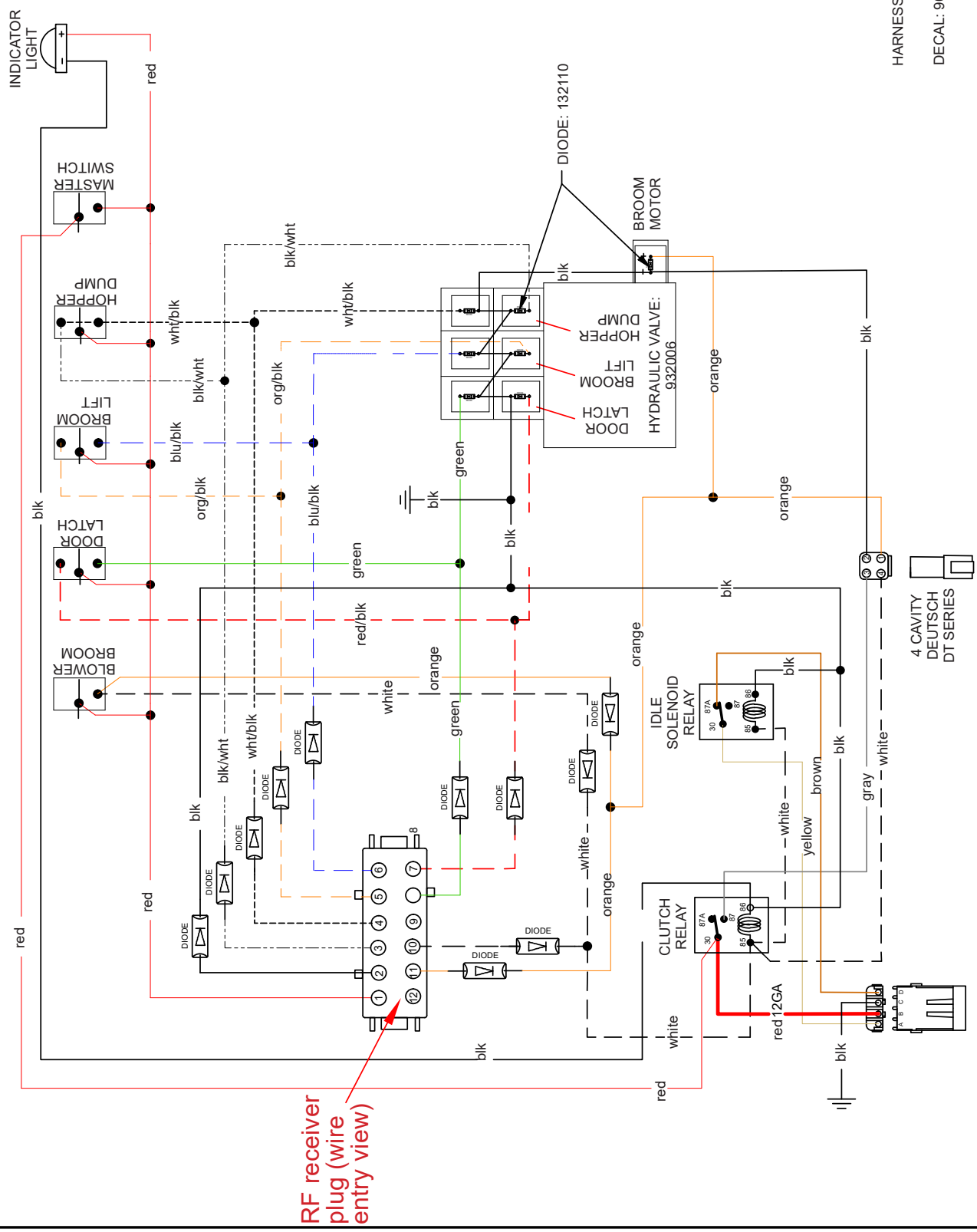


Parts List		
ITEM	QTY	PART # DESCRIPTION
1	4	110119 Nut, 10-24 Lock
2	1	110174 Nut, 1/4-20, Unitorque Lock
6	1	110815 Screw, 1/4-20x3/4 Phillips Pan Head
7	1	110967 Grommet, Rubber 7/16 Id X 3/4 Od
8	1	130012 Clamp, Adel Ac28 .265 Hole
9	5	132035 Switch Boot
11	2	230038 Terminal, Male Push On, 16-14ga
12	4	510960 Screw, 10-24 X 0.5, Rhms
13	2	530007 Toggle Switch
14	3	530020 Switch, Spdt-Momentary
15	2	530111 Relay
16	1	532059 Light, Indicator, Led
17	1	902089 Decal, Switches Tv60r E
18	1	902161 Decal, Tv 60 Wiring Schematic
19	1	932058 Harness, Receiver Tv60
20	1	935025 Transmitter/Receiver, Kar-Tech
21	1	975116 Shield - Valve, Weldment



Optional Corded Remote		
QTY	PART #	DESCRIPTION
1	930011	Corded Remote Assembly

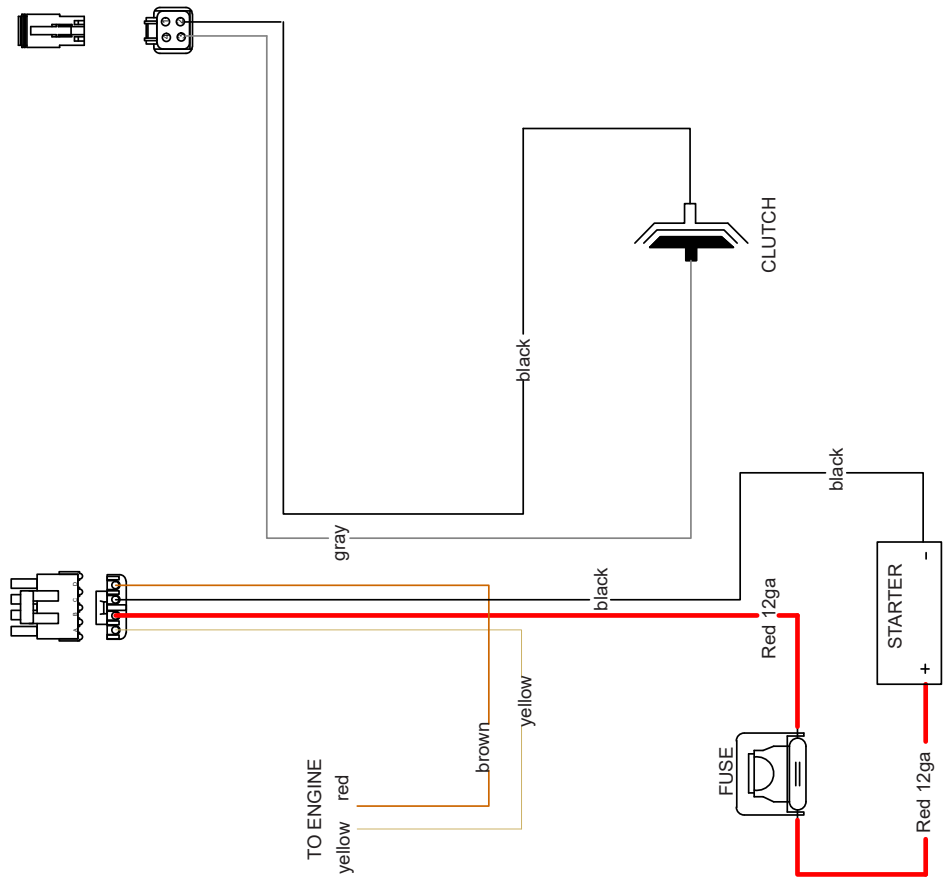
# WIRING SCHEMATIC WITH KAR-TECH REMOTE



HARNESS: 932058  
DECAL: 902161



# ENGINE HARNESS SCHEMATIC

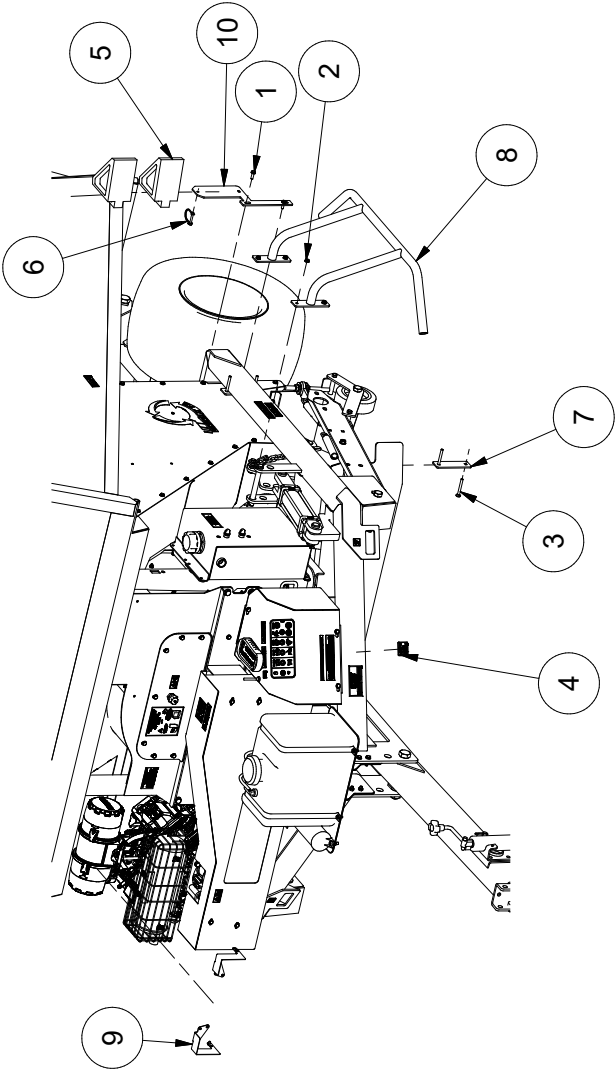


HARNESS: 932061

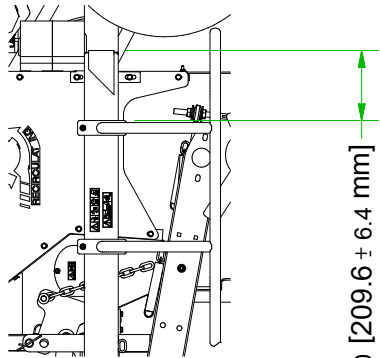
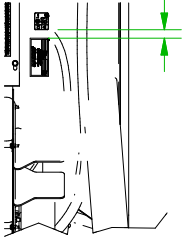
905206

REV: NC

# EXPORT KIT

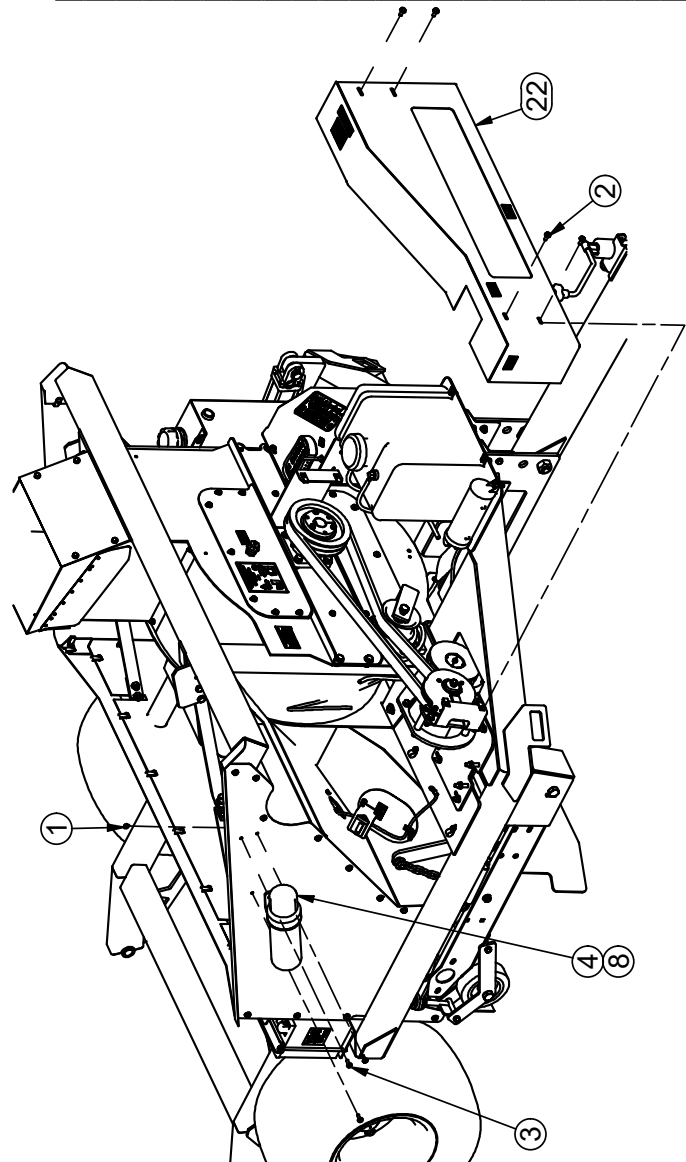


Parts List		
ITEM	QTY	PART # DESCRIPTION
1	2	110459 Bolt, 5/16-18 X 1, Wiz Flange
2	8	110606 Nut, 5/16-18 Wiz Flange
3	8	112090 Bolt, 5/16-18 X 2.75 In Carriage
4	1	302206 Decal, Sound Level Tv60re
5	2	302207 Wheel Chock, Solid Rubber
6	1	510962 Pin, Wire Lock
7	4	911272 Side Guard Bolt Plate
8	2	915856 Side Guard W/A
9	1	942309 Kit, Exhaust Side Shields, CE
10	1	970937 Chock Hanger



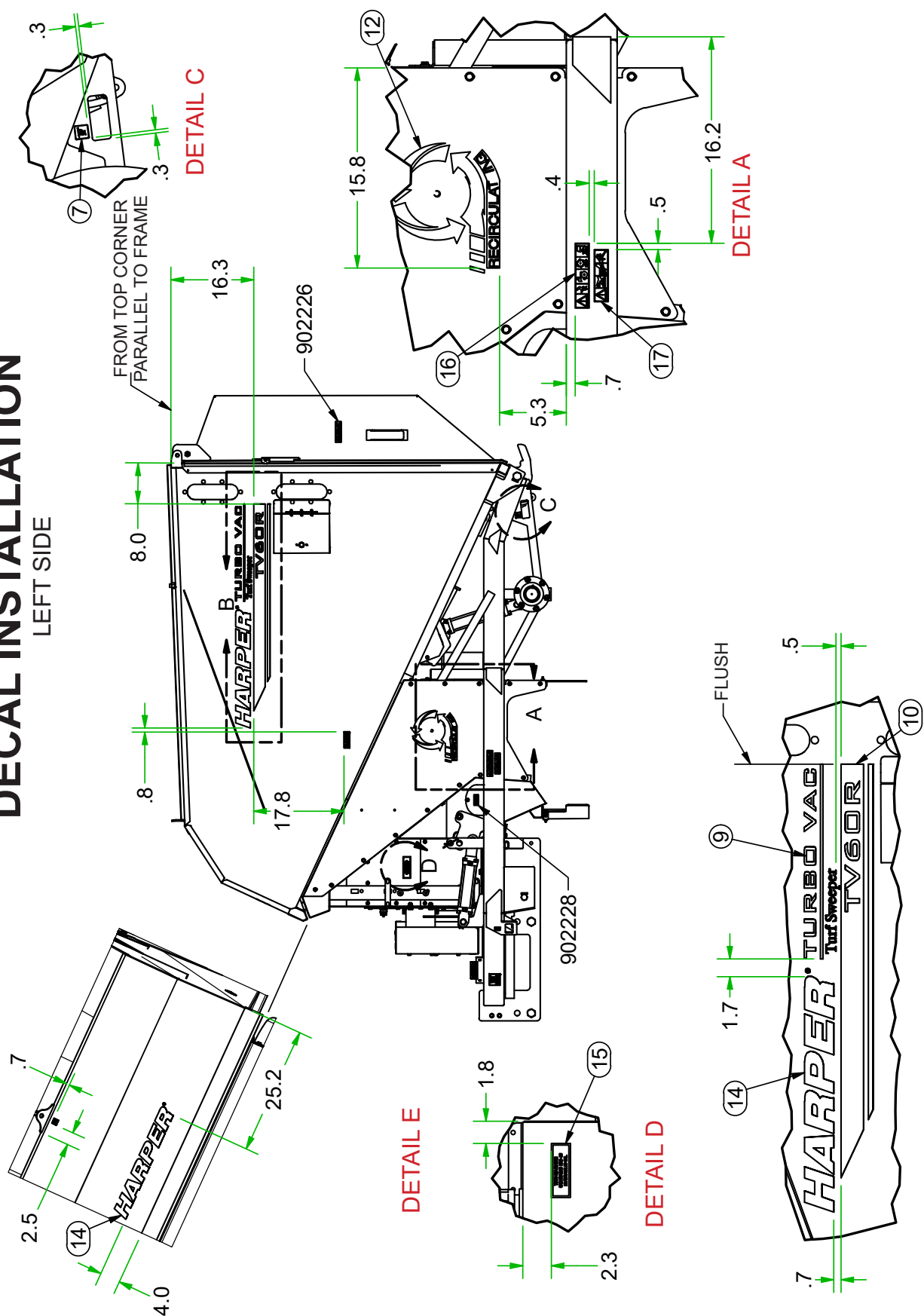
8.25 ± 0.250 [209.6 ± 6.4 mm]

# FINAL INSTALLATION



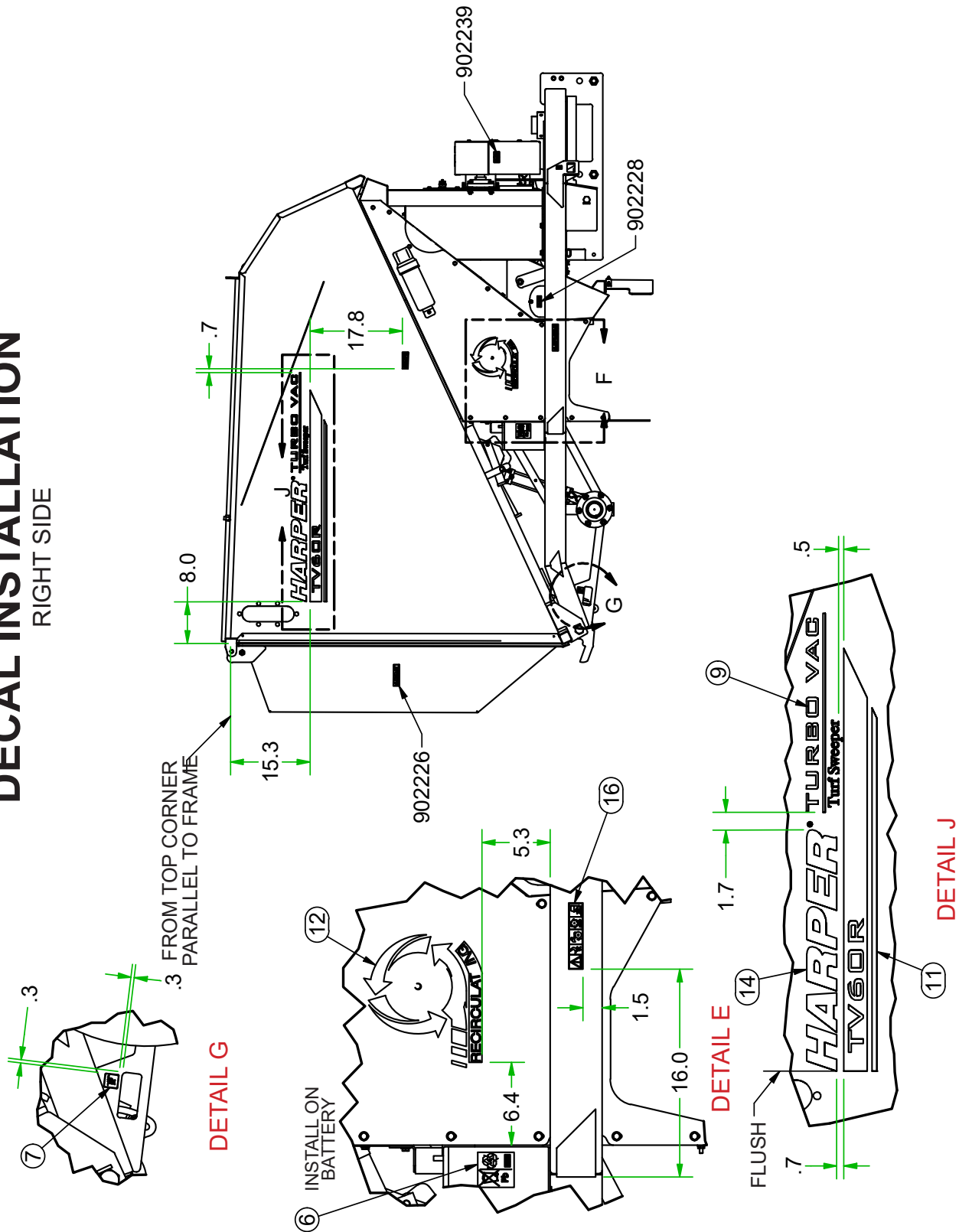
Parts List		
ITEM	QTY	PART # DESCRIPTION
1	3	110290 Nut, 1/4-20 W/ Flange
2	17	110444 Bolt, 5/16-18 X 0.75, W/ Flange
3	3	110468 Bolt, 1/4-20 X 0.75, W/ Flange
4	1	152005 Holder, Manual
5	1	202134 Decal, Prop 65, Short Form
6	1	800195 Decal, Recycle Battery
7	4	802067 Decal, Tie Down Point
8	1	901001 Document, Carb Warranty
9	2	902084 Decal, Turbo Vac, Turf Sweeper
10	1	902102 Decal, Stripe Left Tv60r
11	1	902103 Decal, Stripe Right Tv60r
12	2	902104 Decal, Recirculating
13	1	902149 Decal, Read Operators Manual.
14	3	902195 Decal, Harper 2.87 X 24.00, Black
15	1	902204 Decal, Iso 46 Hydraulic Oil
16	2	902227 Decal, Entanglement
17	1	902232 Decal, High Pressure Injection
18	1	902234 Decal, No Lift
19	1	902235 Decal, Safe Distance, No Slope
20	2	902245 Decal, Hopper Safety Lock
21	1	902247 Decal, Overhead Clearance
22	1	902248 Decal, Emissions Compliance, Carb
23	1	902259 Decal, California Spark Arrester
24	1	905193 Assy, Belt Shield W/Decals

# DECAL INSTALLATION LEFT SIDE



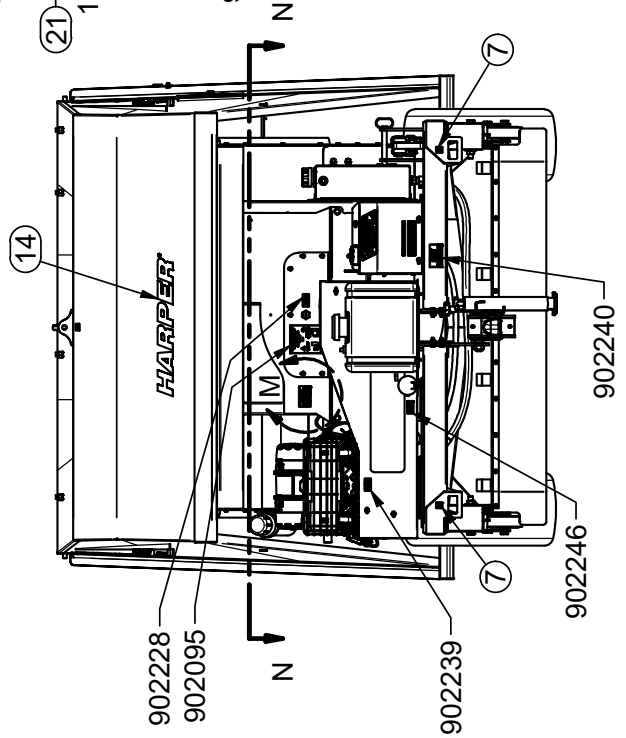
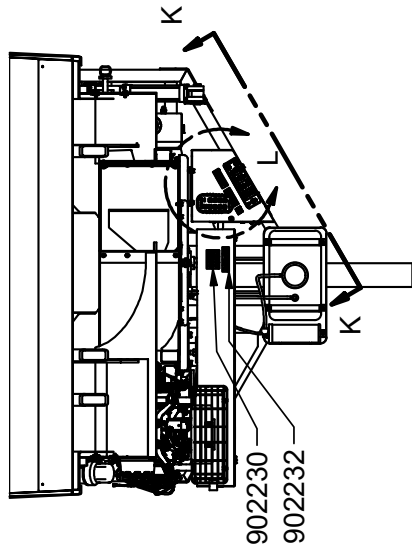
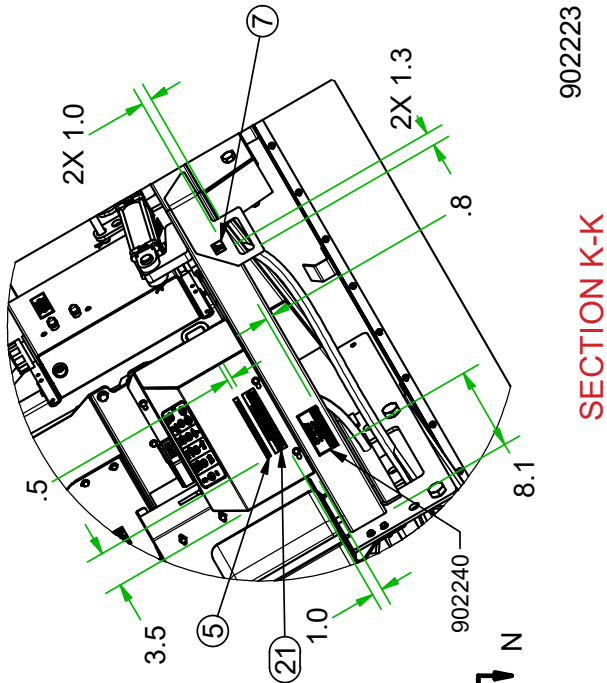
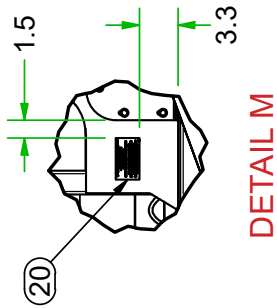
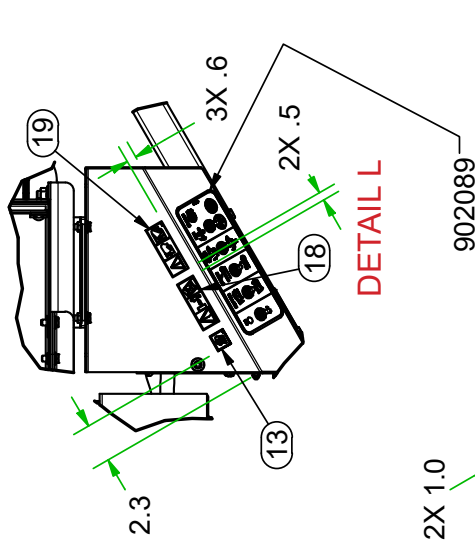
# DECAL INSTALLATION

RIGHT SIDE



# DECAL INSTALLATION

905140 REV: F

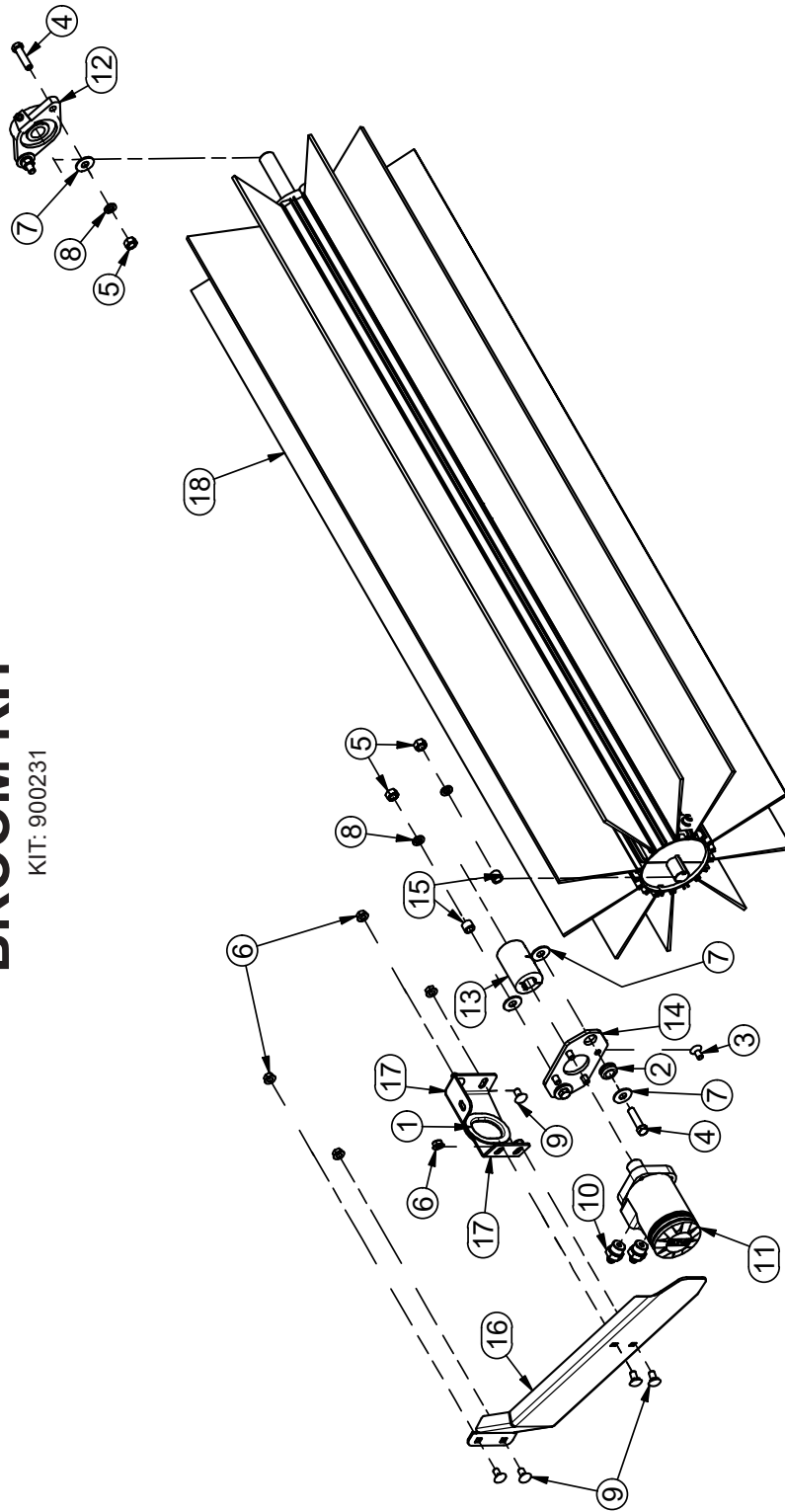




Parts List				Parts List				Parts List				900231	REV: D
ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION		
1	1	100365	MOULDING, EDGE	7	6	110670	WASHER, 7/16" FLAT STANDARD	13	1	942190	COUPLER, CLAMP, 1" SHAFT		
2	2	102005	GROMMET, RUBBER .875 OD X .625 ID	8	4	110671	WASHER, 7/16" LOCK	14	1	970147	MOUNT - MOTOR PLATE		
3	4	110126	BOLT, 3/8-16 X .75 FLT HD SKT HD	9	6	110894	Bolt, 3/8-16 X 0.75 in Carriage	15	2	970230	BROOM MOTOR SPACER		
4	4	110321	BOLT, 7/16-14 X 1.75 GR 5 HEX HEAD	10	2	120144	ADAPTER, 6MJ-10MB	16	1	970828	GUARD - MOTOR, DECK, TV60		
5	4	110641	NUT, 7/16-14	11	1	922004	MOTOR, EATON 101-1010	17	1	970830	SUPPORT - TORQUE ARM		
6	6	110645	NUT, 3/8-16 WIZ FLANGE	12	1	942080	BEARING, 1" 2 BOLT FLANGE	18	1	975049	ROTARY BRUSH ASSEMBLY, TV-60R		

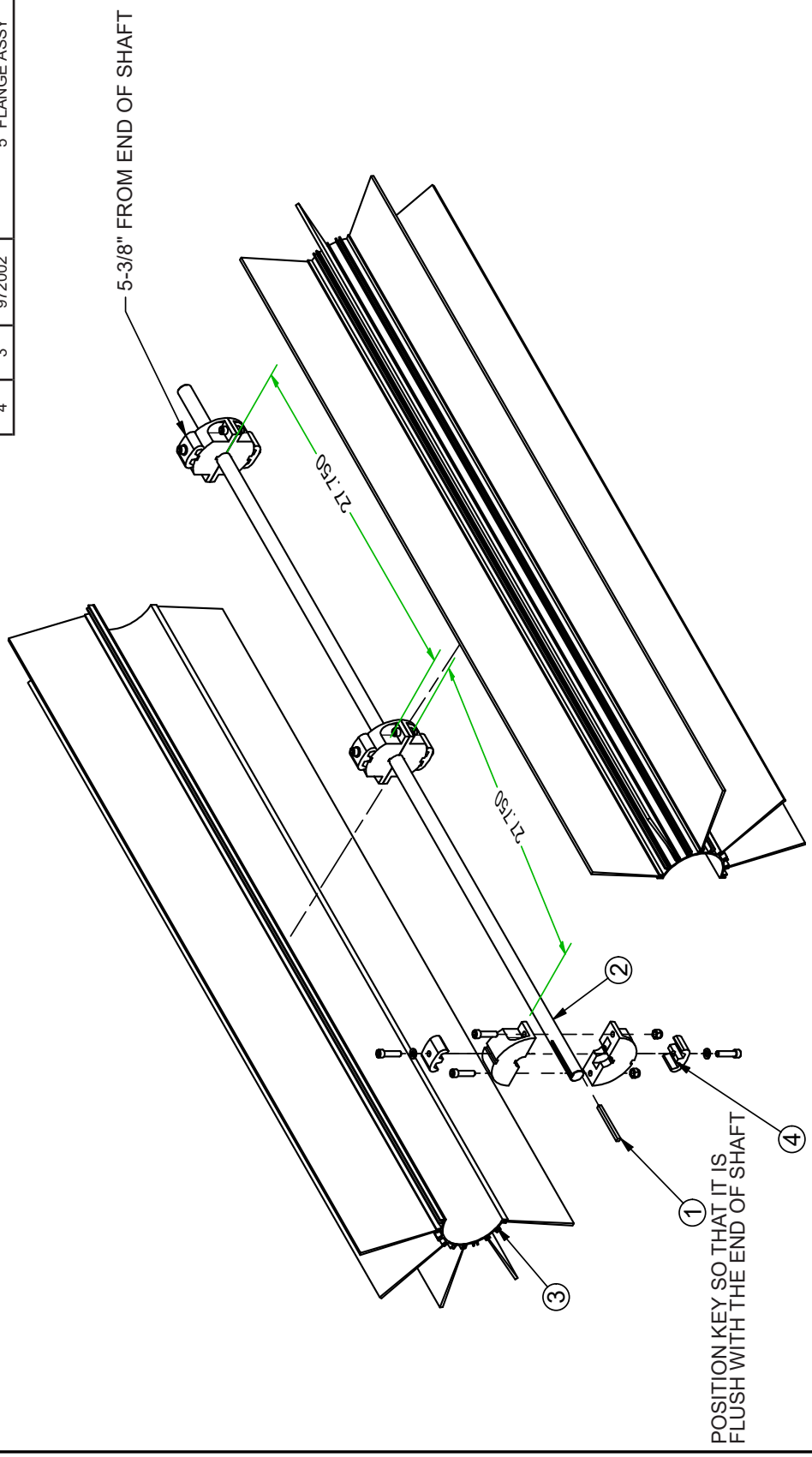
## BROOM KIT

KIT: 900231

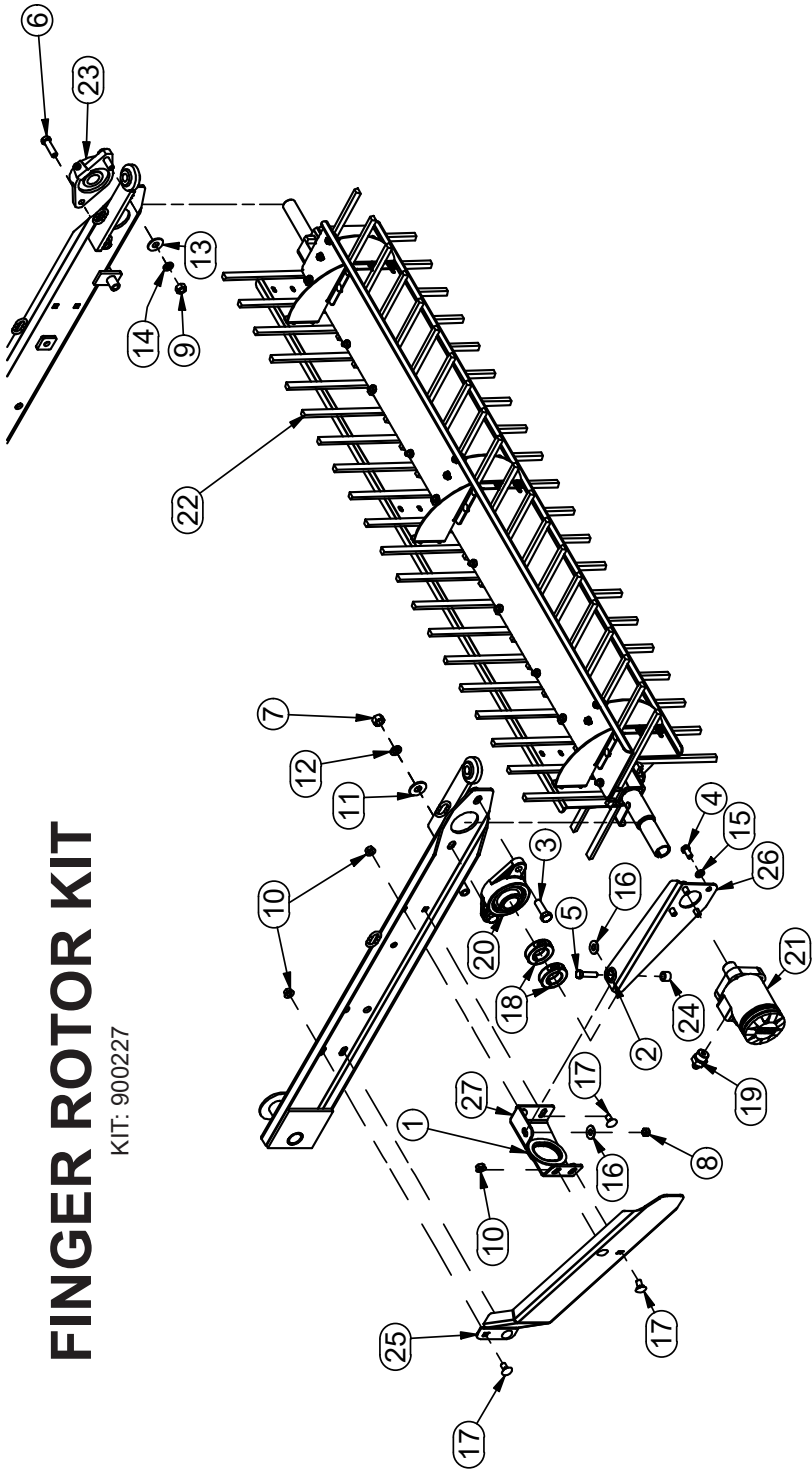


Parts List			
ITEM	QTY	PART #	DESCRIPTION
1	1	110340	KEY, 1/4 X 1/4 X 3.25
2	1	970229	ROTARY BRUSH SHAFT
3	1	972001	BROOM, PARALAX TG-20, .045 BLK
4	3	972002	5" FLANGE ASSY

# BROOM ASSEMBLY



900227				REV: B			
Parts List				Parts List			
ITEM	QTY	PART #	DESCRIPTION	ITEM	QTY	PART #	DESCRIPTION
1	3"	100365	Moulding, Edge	10	6	110645	NUT, 3/8-16 WIZ FLANGE
2	1	102005	GROMMET, RUBBER .875 OD X .625 ID	11	2	110658	WASHER, 1/2" FLAT STANDARD
3	2	110429	BOLT, 1/2-13 X 1.5	12	2	110666	WASHER, 1/2" LOCK
4	4	110433	BOLT, 3/8-16 X .75	13	2	110670	WASHER, 7/16" FLAT STANDARD
5	1	110435	BOLT, 3/8-16 X 1.5	14	2	110671	WASHER, 7/16" LOCK
6	2	110535	BOLT, 7/16-14 X 1.5	15	4	110672	WASHER, 3/8" LOCK
7	2	110610	NUT, 1/2-13	16	2	110676	WASHER, 3/8" FLAT STANDARD
8	1	110621	NUT, 3/8-16, UNITORQUE LOCK	17	6	110894	Bolt, 3/8-16 X 0.75 in Carriage
9	2	110641	NUT, 7/16-14	18	2	110956	COLLAR - 1-1/4" SPLIT
				19	1	970829	ARM - TORQUE, TV60
				20	1	410928	BEARING, SLAT DRIVE 1.25 SHAFT
				21	1	420127	MOTOR, EATON 101-1009
				22	1	914014	ASSEMBLY, TV60RE FINGER ROTOR
				23	1	942080	BEARING, 1" 2 BOLT FLANGE
				24	1	970230	BROOM MOTOR SPACER
				25	1	970828	GUARD - MOTOR, DECK, TV60
				26	1	970829	ARM - TORQUE, TV60
				27	1	970830	SUPPORT - TORQUE ARM

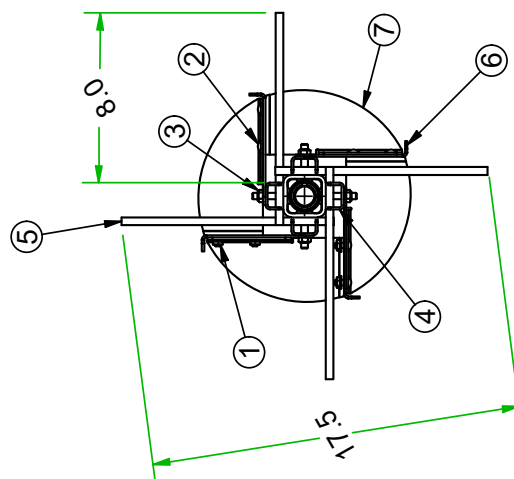
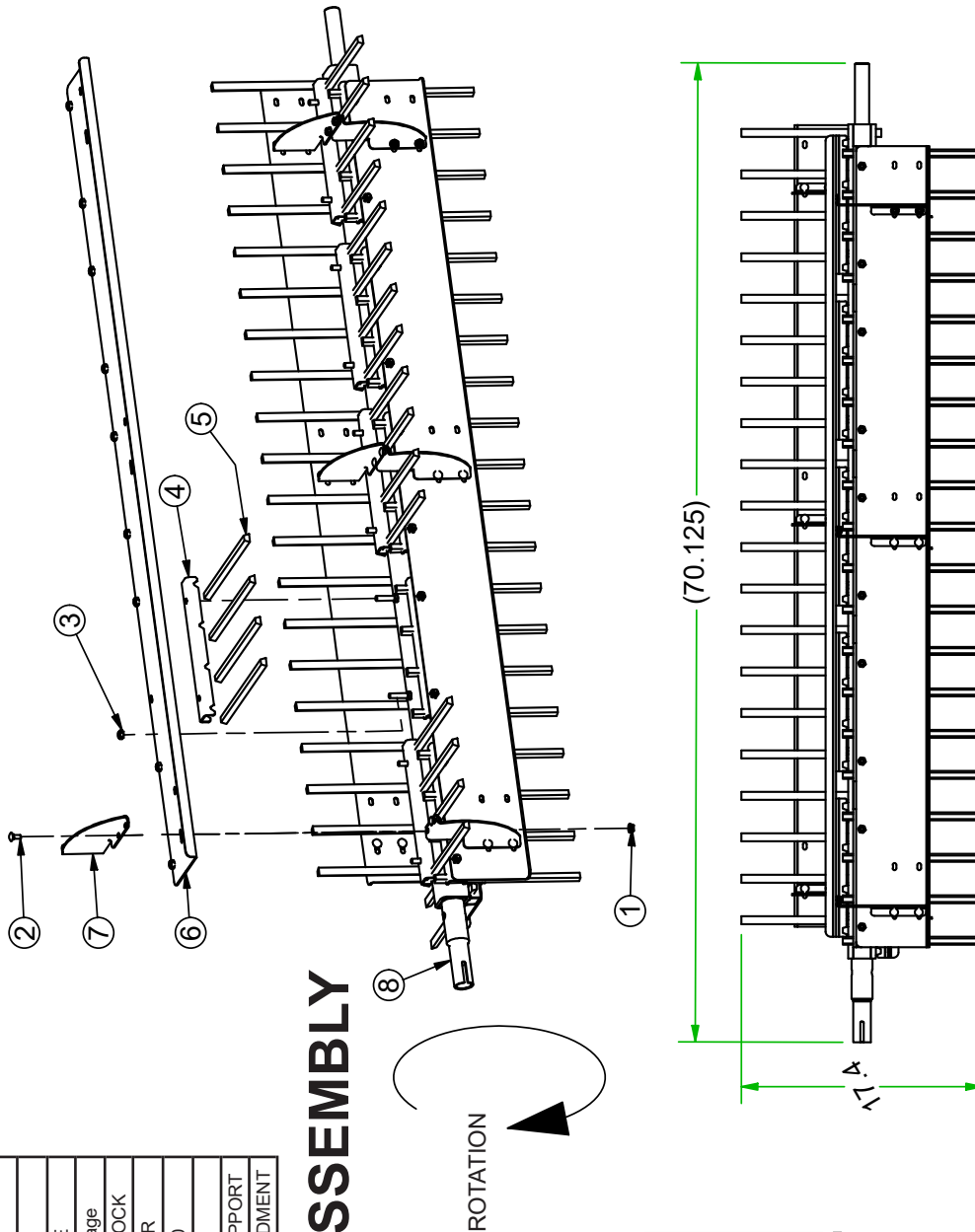


# FINGER ROTOR KIT

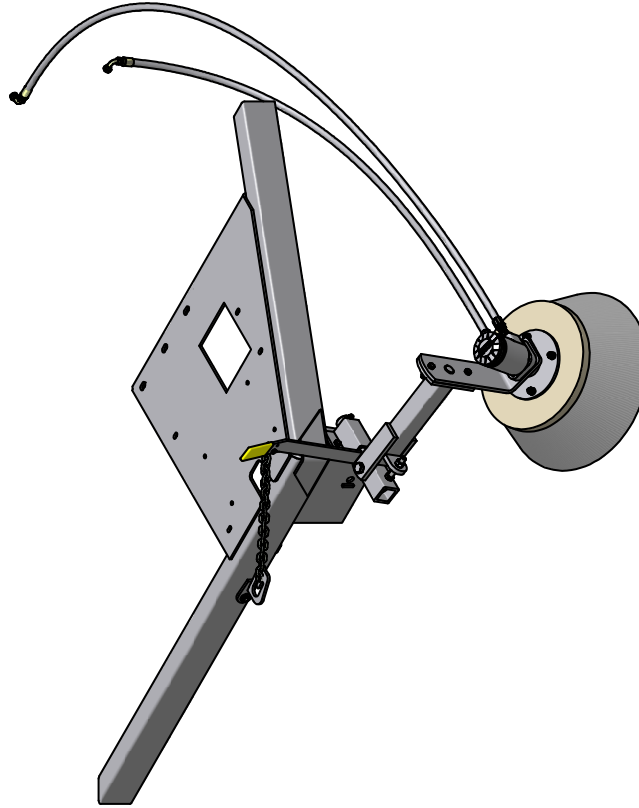
KIT: 900227

Parts List		
ITEM	QTY	PART # DESCRIPTION
1	30	110290 NUT, 1/4-20 WIZ FLANGE
2	30	110358 Bolt, 1/4-20 X 0.625 in Carriage
3	40	110600 NUT, 5/16-18, UNITORQUE LOCK
4	20	311403 CLAMP - RUBBER FINGER
5	80	902160 FINGER - RUBBER, TV60
6	4	970824 SUPPORT - FINGER
7	12	970827 GUSSET - FINGER ROTOR SUPPORT
8	1	975802 SHAFT - FINGER ROTOR, WELDMENT

## FINGER ROTOR ASSEMBLY



# FENCE BRUSH OPTION



Parts List		
QTY	PART #	DESCRIPTION
1	110015	BOLT, 3/8-16 X 3.0
1	110298	WASHER, 1/4" FLAT SAE
1	110378	BOLT, 5/16-18 X 2.0
1	110385	BOLT, 5/8-11 X 4.0
4	110400	BOLT, 3/8-16 X 2.0
4	110420	BOLT, 3/8-16 X 1.0
2	110425	BOLT, 3/8-16 X 1.25
2	110435	BOLT, 3/8-16 X 1.5
1	110464	BOLT, 1/4-20 X 1.0
1	110474	BOLT, 1/4-20 X 1-1/2
1	110553	BOLT, 1/2-13 X 2.5 TAP
1	110603	NUT, 5/16-18 LOCK (NYLON)
1	110610	NUT, 1/2-13
8	110612	NUT, 3/8-16 GR 2
1	110618	NUT, 3/8-16 LOCK NYLON INSERT
1	110630	NUT, 1/4-20 LOCK (NYLON INSERT)
1	110639	NUT, 5/8-11, UNITORQUE LOCK
1	110667	WASHER, 1/4" LOCK
12	110672	WASHER, 3/8" LOCK
6	110676	WASHER, 3/8" FLAT STANDARD
2	120144	ADAPTER, 6MJ-10MB
1	902112	BRUSH, 18" x 6" x 40 DEG
1	910044	COVER, VINYL .25 X 1.5 X 4 GRIP
1	922004	MOTOR, EATON 101-1009
1	922090	Hose, valve to fence brush motor
1	922091	Hose, fence brush motor to broom motor
1	970304	PUMP STOP CHAIN
1	970748	ARM, BRUSH MOTOR MOUNT
1	970759	SHAFT, LIFT PIVOT
1	970763	WASHER, 1.50 X .320
1	970764	SPACER, 1.700 X 1.005 X .320
1	975125	LIFT TUBE WELDMENT
1	975127	LIFT LEVER WELDMENT
1	975128	BRUSH ADAPTOR WELDMENT
1	975130	LIFT LATCH WELDMENT
1	975136	EDGE BRUSH HANGER WELDMENT

3/16/2006

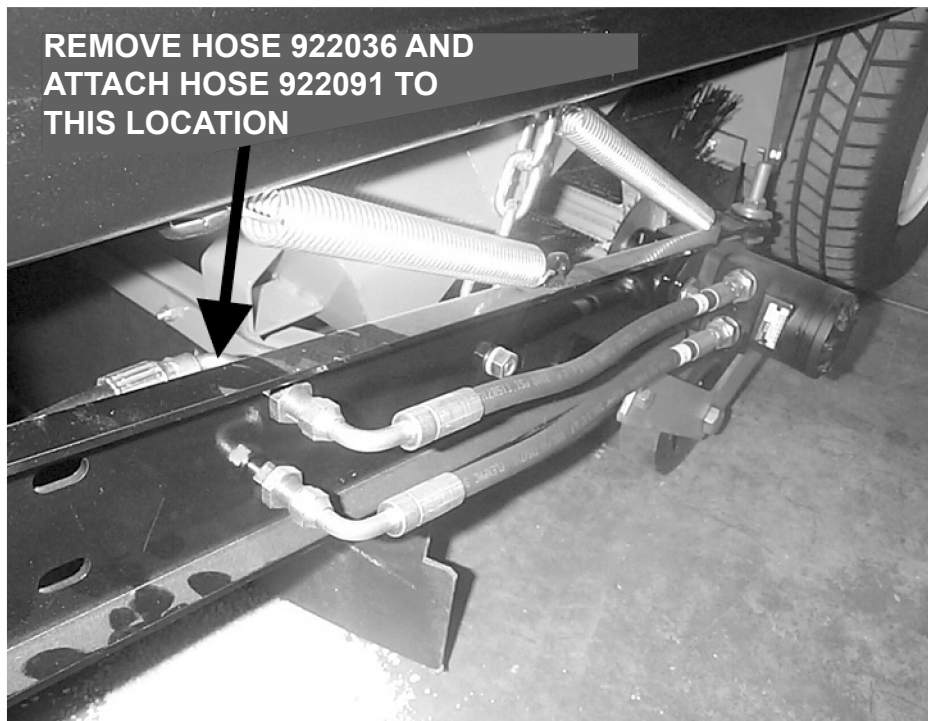
[illegible]

## SECTION B-B

**HARPER**  
TURF EQUIPMENT



## TV60RE EDGE BRUSH HYDRAULIC HOSES



## NOTES

Harper Industries, Inc.  
151 E. Highway 160  
Harper, KS 67058

Telephone: 620-896-7381  
Toll-Free: 800-835-1042  
Fax: 620-896-7129

Website: [www.harperindustries.com](http://www.harperindustries.com)

E-mail: [info@harperindustries.com](mailto:info@harperindustries.com)