



OPERATOR'S AND MAINTENANCE MANUAL

WITH PARTS LISTING

Long Reach Mower

Model: LR50160

**FOR SERIAL #s STARTING
WITH 007615 TO 008019
RELEASED 04/16/10**



⚠ DANGER
*Read this manual and the manual for
your tractor carefully to acquaint yourself
with both machines before operating!*

MODEL NUMBER _____
 SERIAL NUMBER _____
 DATE OF PURCHASE _____

Customer Pre-Operation Check List		Reference
<input type="checkbox"/>	Read, understand and follow the general safety rules listed in this manual.	Page 2
<input type="checkbox"/>	Check all shields and guards.	Page 2
<input type="checkbox"/>	Cut driveshaft to the proper length for your tractor.	Page 8
<input type="checkbox"/>	Add ballast to the rear tractor tires and space them six feet or wider apart.	Page 8
<input type="checkbox"/>	Add ballast and front weights to your tractor, if needed.	Page 8
<input type="checkbox"/>	Check all fluid levels, tractor and mower.	Page 11
<input type="checkbox"/>	Turn gate valve under the oil tank "on".	Page 12
<input type="checkbox"/>	Check all grease fittings.	Page 15

Service Notice

Please take extra care while servicing the hydraulic system by keeping all openings properly covered, thus preventing contamination of the hydraulic components. Contaminates in the oil WILL cause faulty operation or premature failure of components in the hydraulic control valve, pump, and motor.

Disclaimer

THIS MOWER IS NOT DESIGNED TO CUT TREES FROM TOP TO BOTTOM (VERTICALLY) WITH THE MOWER DECK IN THE HORIZONTAL POSITION (See Fig. 1). The mower is designed to trim branches with the mower deck in the VERTICAL position while moving the tractor forwards or backwards, repositioning the mower deck after each path (See Fig. 2).

The mower is also designed to cut tree trunks and branches up to 4" in diameter with the "Hinged Gate" in the unlocked, secured raised position and the mower deck in the HORIZONTAL position, perpendicular to the trunk and/or branch of the tree (See Fig. 3).

Any modes of operation other than the ones described above and shown below, while cutting trees and/or branches are not permitted and shall void the warranty. Moreover, HARDEE by EVH Manufacturing Company, LLC does not accept any liability to any person and/or material when the mower is operated in violation of the above information.



Fig. 1

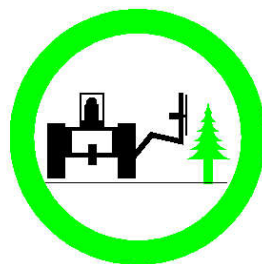


Fig. 2



Fig. 3

Table of Contents

Section 1 Introduction	1	Cylinder Speed	17
To Our Customers	1	Adjusting the Cylinder Control Valve	17
Owner's Responsibility	1	Individual Cylinder Counterbalance Valves	17
Purpose Of This Manual	1	LR50160 Control Valve Port Listing	18
Safety-Alert Symbol	1	Control Valve Port Schematic	19
Signal Words	1	LR50160 Valve / Joystick Wiring Schematic	20
Customer Assistance	1	Routine Maintenance Checklist	21
Section 2 Safety Information	2	Section 6 Troubleshooting	22
General Safety Rules	2	Troubleshooting Guide	22
Safety Decals	3	Fault Codes for Status LED	24
Section 3 Assembly And Installation	7	Controller Diagram	25
Component Identification And Terminology	7	LR50160 Electric Schematic	26
Tractor Requirements	8	Section 7 Specifications	27
Driveshaft Installation	8	Summary Of Specifications	27
Driveshaft Installation On Pump Shaft	8	Section 8 Replacement Parts	28
Tractor Hook-Up Procedures	8	Parts Listing For Long Reach Cutter LR50160	28-34
Driveshaft Installation On PTO	9	Blade Hydraulic / Cylinder Hydraulic Schematic	35
Hydraulic System Setup	9	Oil Cooler Wiring Harness	36
Working Safely With Hydraulic Lines	9	Hydraulic Motor Housing Assembly	37
Description of Operation	9	Blade Holder Assembly Breakdown	38
Joystick Functions	9	Front Chain Guard Breakdown	39
Tethered Grip with Micro-Joysticks	10	Rear Chain Guard Breakdown	40
Section 4 Operation	11	Logo/Decal Replacement	41
Operation Instructions	11	10601 Driveshaft Breakdown	42
During Operation	11	11716 Driveshaft Breakdown	43
Daily Start-Up Checklist	11	11717 Driveshaft Breakdown	44
Operating Environment	11	Section 9 Reference	45
Application Do's And Don'ts	11	Bolt Torque	45
Using Your Mower	12	Checking Bolt Torque	45
Getting Started	12	Torque Specifications	45
Joystick Control	12	Section 10 Warranty	46
Boom Breakaway	13		
Mowing In Reverse	13		
Side Dressing Trees	13		
Cutting Larger Brush And Trees	13		
Unhook And Post Use Care	14		
Unhooking The LR50160	14		
Post Use Care	14		
Section 5 Maintenance	15		
Maintenance And Service Schedule	15		
First Stage Boom	15		
First Stage Boom To Second Stage Boom	15		
Deck And Second Stage Boom	15		
Hydraulic Motor Housing & Belting Extension	15		
Greasing PTO Driveshaft To Pump	15		
Inspection And Replacement Of Blades	16		
Inspection And Replacement Of Blade Holder	16		
Inspection	16		
Replacement	16		
Checking the Main Relief Valve	16		

© Copyright 2004 All Rights Reserved

Hardee by EVH provides this publication "as is" without warranty of any kind, either expressed or implied. Every precaution has been taken in the design of this manual, however Hardee by EVH assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. Hardee by EVH reserves the right to revise and improve this product at any time. The illustrations in this manual are not intended for the safe and proper assembly or disassembly of this product, but for parts ordering reference only.

To Our Customers

We at Hardee by EVH Manufacturing Company thank you for buying your new Long Reach Mower.

We have tried hard to build a mower to do the work you have in mind. Many hours of engineering, field-testing and improvement have gone into the design and fabrication of your mower. We will strive to continue this quality of manufacturing in the future, always keeping the customer's needs clearly in mind.

The best performance of your mower will depend on you. Proper lubrication, maintenance, hookup, adjustments and operation are essential for it to give you long and dependable service. However, as with any type of equipment, your mower is designed to perform specific functions.

In this manual, you will find instructions on mower features, maintenance and operation. If customer service or repair parts are required, contact your local Hardee dealer. Please specify model and serial number when ordering parts.

Owner's Responsibility

The manufacturer has no control over the ultimate use of the mower and therefore assumes no responsibility or liability for damage or injury resulting from the use of this machine.

The upkeep of the hydraulic mower is the responsibility of the user. This upkeep includes all shielding, guards, and safety decals (OSHA Regulation 1928.57). You can obtain replacement parts from any authorized Hardee dealer.

Read this Operator's Manual before operating the mower. Failure to do so could result in injury to the operator or to others. Remember that most accidents occur due to neglect or carelessness. The operator is responsible for inspecting and making repairs as may be necessary. Cleaning after each use and storage under a shelter will extend the life of the mower.

Purpose of This Manual

This manual provides information on safety, operation, adjustments, troubleshooting and maintenance of your new mower. Please read and follow all the recommendations to help ensure that you get many years of service from your new Hardee mower.

If you need additional copies of this manual, please contact your local Hardee dealer or download a copy from our website at www.hardeebyevh.com.

Safety-Alert Symbol



This symbol is the safety alert symbol. It appears throughout this manual to call your attention to instructions involving your personal safety and the safety of others. Failure to follow these instructions can result in injury or death.

Signal Words

Safety signal words are words that call attention to the safety sign and designate a degree or level of hazard seriousness. The signal words used throughout this manual are DANGER, WARNING and CAUTION. Please read and follow all safety messages that have these signal words shown for your protection.



DANGER

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



WARNING

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



CAUTION

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

Customer Assistance

The Hardee sales team would like you to be satisfied with your new Long Reach Mower. If for some reason you have any questions about the information in this manual or have a problem with your mower, please discuss the problem or question with the management of your local dealership. If further assistance is required, please contact:

Hardee By EVH Manufacturing Company, LLC
Sales Department
4895 Red Bluff Road
Loris, SC 29569
843-756-2555

Safety Information

General Safety Rules

This section of your manual will address the safe operation of your new mower. We at Hardee strive to produce a machine that is both a quality product and safe to operate. Please take the time to read, understand and follow the safety rules listed below and throughout this manual.

Your safety also depends on you becoming familiar with the basic operation of your new mower. You can find complete instructions for this mower in the Operation Instruction section of this manual. We believe that using your mower safely, in a safe environment will give you great results!

DANGER

This machine is designed for use on a closed cab tractor only! If your tractor has an open cab, then it MUST be equipped with operator protective equipment in the form of shielding from thrown objects and Roll Over Protective Structure (ROPS) to operate this equipment safely.

DANGER

Rotary mowers have the inherent ability to throw debris considerable distances when the blades are allowed to strike foreign objects. The operator must use caution or serious injury may result. Be sure bystanders are at a safe distance at all times when the cutter is in use.

WARNING

Always keep your tractor level as you reach over ditches, etc. Be careful to keep ample distance between the rear tire and the top of the ditch bank to avoid a cave-in of the bank.

WARNING

Failure to keep the tractor level may result in loss of traction, tipping, rollover, property damage, personal injury or death.

WARNING

Never stand, or allow others to stand, under the boom or mowerhead at any time. Never park the unit without placing the mowerhead squarely and firmly on the

ground. Serious injury or death by crushing may occur in case of hydraulic failure.

DANGER

Do not look under the mowerhead or attempt to remove objects or branches from under the mowerhead while the tractor is running. Serious injury, loss of limb or death may result.

DANGER

Do not reach under the mowerhead at any time. Cutting blades may cause serious injury, loss of limb or disfigurement.

WARNING

Never use the mower for a crane or lifting device of any kind. It is not designed for this purpose. Serious damage to unit may occur. Serious bodily injury may be incurred from this misuse.

WARNING

Never use the mower for a man-lift or personnel lift. It is not designed for this purpose. Serious damage to unit may occur. Serious bodily injury may be incurred from this misuse.

DANGER

Never operate the mower within 10 feet of overhead power lines or utility lines. Do not trim trees with power lines running through them. Serious injury or death by electrocution may occur.

WARNING

Never allow the mower to impact rock piles, piles of gravel, steel guardrails or concrete abutments. Contact with these objects could cause blade failure. Serious machine damage, property damage or bodily injury may occur. Check the area for these items before mowing.

DANGER

Never attempt to use the mower to remove brush or trees larger than 4 inches in diameter. Failure to use caution when cutting trees, may lead to the tree falling on the mower deck and tipping the tractor over.

Safety Information

Safety Decals

Your Hardee mower ships with all safety decals in place. They are located in areas on the mower that are potentially hazardous. Please locate, read and follow the information you find on these decals.

By law, you must replace any safety decals that are damaged or missing. You can order replacement decals from any local Hardee dealer. Just ask for part number 15845.

To apply the replacement decals:

- Clean the surface to place the new decal.
- Peel the decal away from the paper backing.
- Press firmly onto the clean surface.
- Squeeze out any air pockets using a straight edge.



Deck



Danger – Thrown Object



Danger – Rotating Driveline



Weight Box



Operating Safety and General Instruction



Warning – Thrown Object (PN 11005)

Safety Decals, continued



Deck



Warning – Rotating Components



Hitch Frame



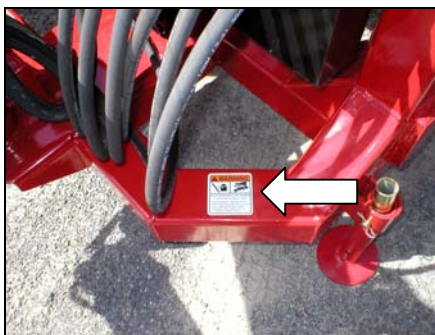
Danger – Crushing Hazard



Hitch Frame



Warning – High Pressure Fluid Hazard

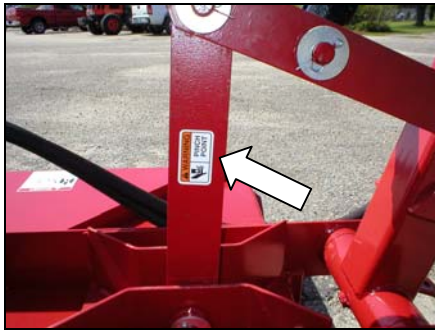


Hitch Frame



Deck

Safety Decals, continued



Deck Linkage



Deck Linkage



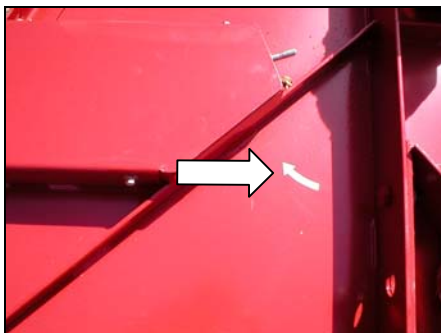
1st Stage Boom



1st Stage Boom



Warning – Pinch Point



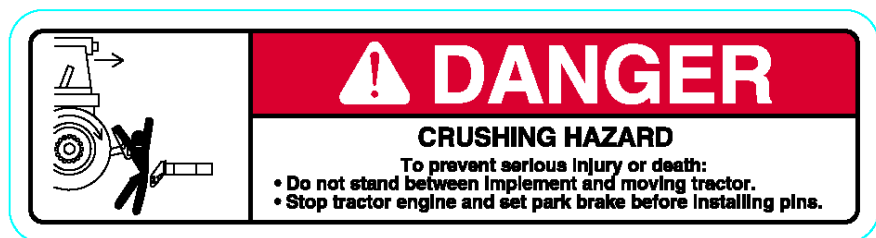
Deck



Blade Rotation



Hitch Frame



Danger – Crushing Hazard

Safety Decals, continued



Deck



Danger – Keep Clear



Hitch Frame



Danger – Electrocution, Falling and Crushing Hazard



Deck



Danger – Exposed Blades



Deck – Front/Rear



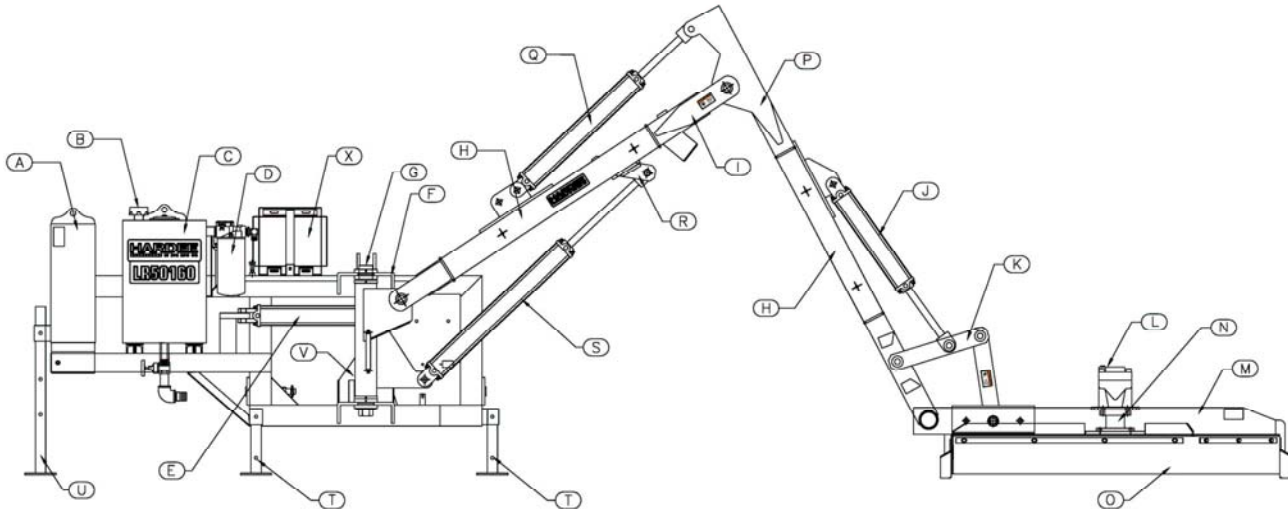
Weight Box – Front/Rear

15852 – Red Reflector, Rear (Not Shown)

15853 – Yellow Reflector, Front

Assembly and Installation

Component Identification and Terminology



A	Weight Box	M	Deck
B	Flow Ezy Breather	N	Motor Drive Housing
C	Oil Tank	O	Rubber Shielding
D	Return Filter	P	2 nd Stage (Reach) Boom
E	Swing Cylinder	Q	2 nd Stage Cylinder
F	Hitch Frame	R	Lift Break-Away
G	Swing Post	S	1 st Stage Cylinder
H	Hose Guard	T	Short Stand
I	1 st Stage (Lift) Boom	U	Long Stand
J	Deck Cylinder	V	Hydraulic Pump
K	Deck Linkage	X	Oil Cooler
L	Hydraulic Motor		

Assembly and Installation

Tractor Requirements

The Long Reach Mower you have purchased is designed for use with 90 horsepower; 4-wheel drive or 100 horsepower; 2-wheel drive and above tractors, equipped with a 540 RPM or 1000 RPM rear power take-off (PTO).

Your tractor must also be equipped with a standard hitch. A category 2 or 3 quick hitch can also be used with this mower.



To insure stability of your tractor, the rear tires should be spaced at their widest setting. We recommend six feet or wider. You should also add ballast to maintain proper steering control and balance. In addition, unless your tractor is 4-wheel drive, you may also need to add front weights. Please refer to the operator's manual for your tractor to determine the correct setup.



Figure 1



DANGER

This machine is designed for use on a closed cab tractor only! If your tractor has an open cab, then it MUST be equipped with operator protective equipment in the form of shielding from thrown objects and Roll Over Protective Structure (ROPS) to operate this equipment safely.

Driveshaft Installation

The make of your tractor will determine the length of driveshaft you require to connect from the end of the pump shaft to the PTO connection of your tractor. This step may require cutting the standard driveshaft included with the Hardee mower. We recommend contacting your local Hardee dealer for assistance.

Driveshaft Installation on Pump Shaft

Refer to Figure 1 for reference

- ✓ Verify that driveshaft is the proper length.
- ✓ Grease both pump shaft and driveshaft.
- ✓ Attach equipment end of driveshaft to pump.
Tractor end has a figure of a tractor stamped onto the guard.
- ✓ Rotate driveshaft to line up holes for securing with the bolt and nut provided.
- ✓ Fix shaft guard to the mower using anti-rotation chain.

Tractor Hook-Up Procedures

- ✓ Hook Tractor 3-point hitch to mower hitch frame. The LR50160 is designed to work with a standard, category 2 or 3 quick hitch.



WARNING

Before leaving the tractor seat, always engage the tractor brake and/or set the transmission of the tractor in parking gear. Stop engine and remove key. Always make sure that no one is between the tractor and the mower when tractor is in motion.

- ✓ Attach driveline to tractor (PTO shaft). (See below for instructions)
 - Verify that the shaft is sufficiently lubed before attachment.
 - Verify that drive shaft is the proper length.
- ✓ Connect joystick to bulkhead connector on the wire cover panel of the controller.
- ✓ Connect joystick to 12-volt system. (Cigarette lighter plug provided with Joystick. Hardee dealer can supply receptacle).
- ✓ Raise all jack stands before moving mower.

Assembly and Installation

Driveshaft Installation on PTO

WARNING

Never attempt any checks, repairs or adjustments with the tractor engine running or the PTO engaged. Adjustment of rotating parts with tractor engine running may result in severe personal injury or death if the PTO accidentally engages.

- ✓ Lift tractor PTO guard.
- ✓ Pull U-joint guard back along driveshaft.
- ✓ Press driveshaft yoke plunger in and slip driveshaft U-joint yoke onto splined PTO shaft. Ensure that yoke plunger returns to locked position.
- ✓ Position U-joint guard over driveshaft U-joint.
- ✓ Lower tractor PTO guard.
- ✓ Fix shaft guard to tractor with anti-rotation chain.

Hydraulic System Setup

IMPORTANT

The hydraulic system setup information contained in the following sections should be used only as a guide. Consult your local Hardee dealer or mower manufacturer for more detailed information.

Working Safely with Hydraulic Lines

Purge all air from hydraulic system before attempting to raise or lower the mower boom and deck.

DANGER

Stand clear if lowering or raising deck, hydraulic deck can fall suddenly from system failure.

DANGER

Do not use your hand or skin to check for hydraulic leaks, use cardboard or wood. High-pressure oil leaks can penetrate skin causing injury and gangrene. Consult a doctor immediately. Always wear safety goggles when working around high-pressure lines.

Description of Operation

The LR50160 is set-up at the factory as a self-contained hydraulic system. This means that the mower pump powers **ALL** hydraulic functions.

A Programmable Processor (Refer to Page 25) controls four cylinder functions (swing, first stage boom lift, second stage boom lift, and mower deck tilt) and one motor function which drives the mower head. A single tethered handheld grip serves as the operator input. The grip includes a dead-man bar, a left two-axis thumb controlled proportional joystick, a right two-axis thumb controlled proportional joystick and a momentary switch controlling a latching circuit turning the mower head motor on and off. A proximity switch is used to decelerate the swing velocity near both stroke ends.

Joystick Functions

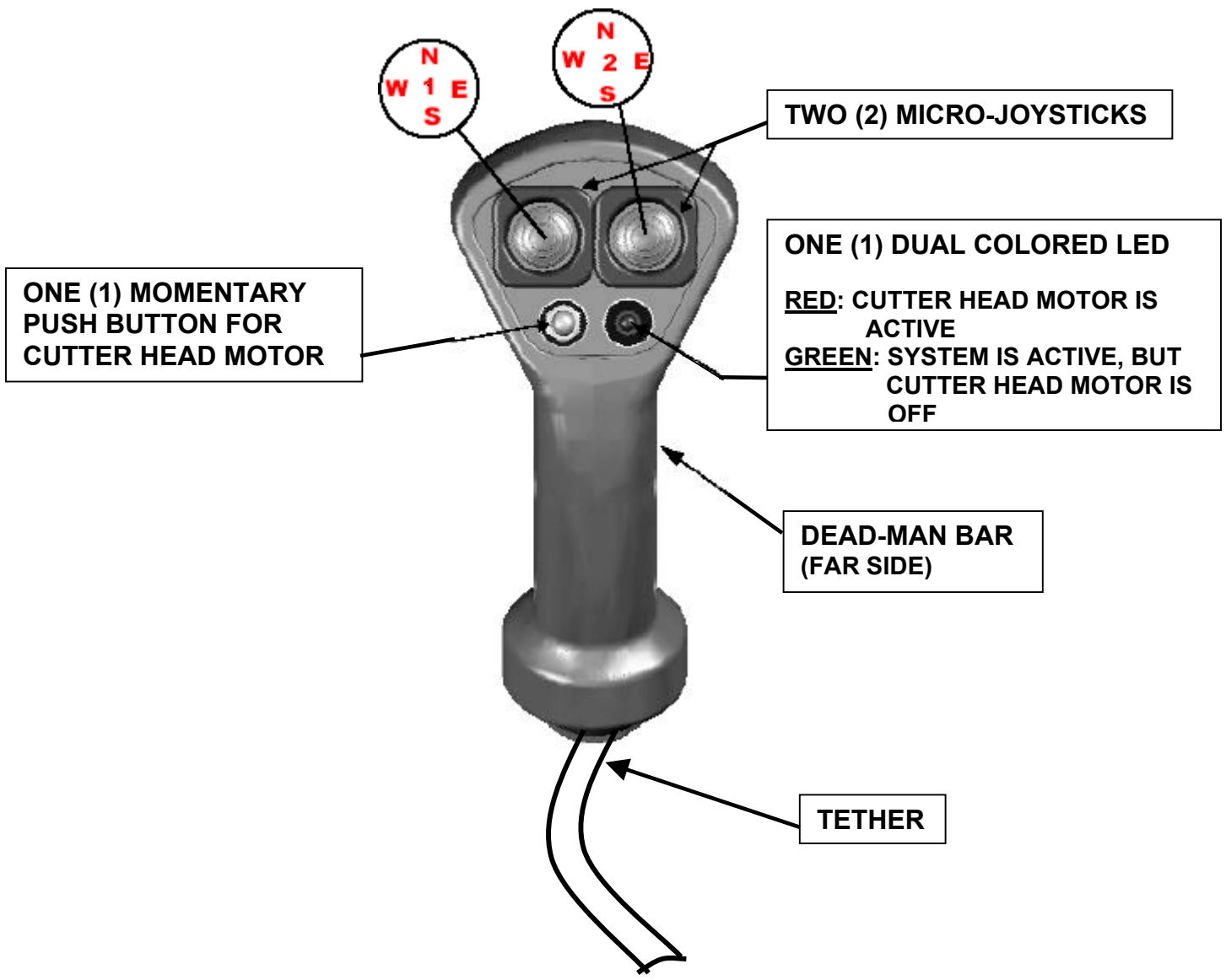
- ✓ Left X-axis (horizontal) controls Deck Down (W) and Deck Up (E).
- ✓ Left Y-axis (vertical) controls First Stage Boom Up (N) and Boom Down (S).
- ✓ Right X-axis (horizontal) controls Swing Left (W) and Swing Right (E). Proximity switch decreases output to Swing by 50% when actuated.
- ✓ Right Y-axis (vertical) controls Second Stage Boom Up (N) and Boom Down (S).
- ✓ LED should be Red when mower head motor is active and Green when the system is active but the mower head is off. LED remains active if dead-man is released until system hibernates.
- ✓ Push Button controls mower head motor. Motor switches on when dead-man bar is depressed and push button is held for two seconds. Motor switches OFF when push button is instantly depressed or fifteen seconds after the dead-man bar is released.
- ✓ System becomes active when Dead-Man Bar is depressed for two seconds. Bar must remain depressed for all control functions to be active except for the fifteen second motor off delay mentioned above. System Hibernates after ten minutes of inactivity on the Dead-Man Bar.

Refer to Figure 2 for joystick functions on Page 10.

TETHERED GRIP WITH MICRO-JOYSTICKS

1W – DECK DOWN
1E – DECK UP
1N – 1ST STAGE BOOM UP
1S – 1ST STAGE BOOM DOWN

2W – SWING LEFT
2E – SWING RIGHT
2N – 2ND STAGE BOOM UP
2S – 2ND STAGE BOOM DOWN



Operation Instruction

Operation Instructions

During Operation



WARNING

Ensure that all bystanders are clear of the mower before starting tractor engine. Objects thrown by the mower blades can cause severe personal injury or death.

Before any operation of the mower, be familiar with the locations and functions of the unit's controls. Being familiar with the mower and its controls will increase efficiency and reduce the possibility of serious injury or damage to the unit.

The operator should work slowly and carefully until he feels comfortable with the mower. Speed and skill will be attained much more easily if the necessary time is spent to familiarize yourself with the mower and its operation.

Get into the habit of completing a walkaround inspection before use. This procedure is a simple method of inspecting your unit's condition by walking around and looking at each component of the unit, including the tractor. This procedure has been used by airline pilots for many years as a final inspection before flight and is also used by long distance ground transportation drivers on buses and trucks. During the walkaround, you will visually search your units tire condition, look for hydraulic leaks, fuel leaks, inspect hose condition and condition of hydraulic cylinders. Look for loose or worn components, see that all guards are in place, check blade condition, look for broken or inoperative lights and determine that it is or is not operable before use. We recommend that you follow this procedure before start up.

Daily Start-Up Checklist	
Check	Section
<input type="checkbox"/> Check All Fluid Levels, Tractor & Mower, For best results, use Hardee hydraulic oil – part number 23333	-
<input type="checkbox"/> Grease Points	Page 15
<input type="checkbox"/> PTO Shaft, Check Grease	Page 15
<input type="checkbox"/> Blade Tightness	Page 16

Operating Environment

Application Do's and Don'ts

There are obvious and hidden potential hazards in operating this mower. **REMEMBER!** This machine is often operated in rough terrain conditions that include gullies, holes, slopes and hidden obstructions. Serious injury or even death may occur unless care is taken to assure the safety of the operator and bystanders in the area.

Included here is a list of safety messages, which should be followed. Observing these messages and using common sense learned from experience help eliminate the hazards of operating this and other machinery.



DANGER

Read this manual and the manual for the tractor carefully to acquaint yourself with both machines before operating. **REMEMBER, power-driven equipment should be operated only by those trained and familiar with the operation and instructed to do so.** Working with unfamiliar equipment or in unfamiliar conditions can lead to accidents.



WARNING

Before leaving the tractor seat, always engage the tractor brake and/or set the transmission of the tractor in parking gear. Stop engine and remove key.



DANGER

Never allow riders on tractor or equipment. Falling off can cause serious injury or death.



WARNING

Worn or dull mower blades can cause excessive mower vibration resulting in damage to the gearbox and structural damage to the mower. You should replace or sharpen blades in pairs. Excessive vibration can cause rotating parts to break and fly off the mower, causing serious injury or death to the operator or bystanders.



DANGER

Do not modify or alter this machine or any of its components or any equipment function without consulting HARDEE BY EVH Manufacturing Company.

Operation Instruction

Using Your Mower

Getting Started

You will need to spend some time getting the “feel” of your new mower. Spend time reviewing the following steps before using your mower for the first time. The time that you take will greatly enhance your ability to get the desired results when you begin mowing.

- ✓ Locate the tethered grip mounted on the right side of the tractor and move the two joysticks through the positions shown on the instruction decal.
- ✓ The next step is to attach the mower to the tractor, see the hook-up procedures on page 8 for complete instructions. After you have the mower attached, double check to ensure that no part of the tractor is in contact with the mower.
- ✓ Next, follow the instructions for installing the driveshaft. Check to see that all PTO guards are in place correctly.
- ✓ Connect joystick cable to the bulkhead connector on the wire cover box. Make sure that all hoses and the joystick connection cable will not contact the PTO shaft. Use velcro straps to tie pendant cable to top link.
- ✓ Check the blades for sharpness. Check the blade carrier castle nut and both blade bolts for tightness. Verify that the gate valve under the oil tank is “on”. *The mower is shipped with the gate valve in the “off” position.*

Danger

Before proceeding, make sure that no other persons are in close proximity to the mower!

- ✓ With all controls in neutral, the tractor in park, the throttle in idle position and the joystick power switch off... Start the tractor engine.
- ✓ Slowly engage the PTO shaft.
- ✓ Now with the mower under power, practice using the joystick to control the movement of the mowerhead and boom arms.

Joystick Control

- Turn “Power On” switch located to the right of the joystick control handle, “on”.

After you feel comfortable with the basic mower control, the next step is to start the blades.

- ✓ Hold lower left-hand button for (2) two seconds or unit LED turns red.

Danger

Do not change the blade rotation direction! Blades must rotate in the clockwise direction indicated by the rotation decal on the mower deck.

- ✓ After the mower is running smoothly, increase the tractor to 800 PTO RPM (Max. 1000 RPM) and lift the mowerhead off the ground. Swing the mowerhead to the mowing position, which is three ‘o’ clock on the right side of your tractor. (If moving in reverse, swing deck back 15°).
- ✓ Release the tractor from park and put the transmission in low range. You are now in mowing mode and are underway.

Operation Instruction

The terrain and the kind of material being cut will determine your ground speed. Remember that you will need to raise and lower the mowerhead to follow the ground contour you are cutting.

Boom Breakaway

The LR50160 is designed with an automatic breakaway system to protect the mower booms. This works when the mowerhead contacts a solid obstruction or the mowerhead is “grounded” while the tractor is in motion. The breakaway is activated through the hydraulic valve and will function mowing both forward and backward.

When the mowerhead strikes a solid object the booms will begin to break back, IMMEDIATELY stop your tractor and adjust the position of the booms to clear the object.

If you “ground” the mowerhead and the booms begin to break back, simply lift the boom slightly to free the mowerhead, then swing the boom back into normal mowing position. See figure 2

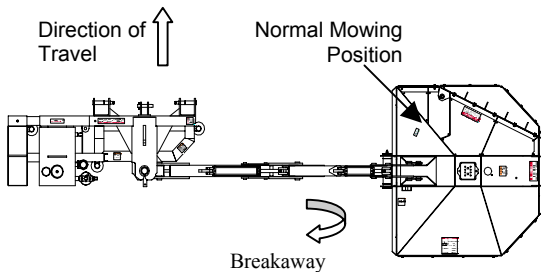


Figure 2

Mowing in Reverse

Your Hardee unit can cut as easily when the tractor is moving in reverse as forward. The breakaway protection works in the same way. The only difference being you must swing the booms to the rear 10 – 15 degrees. This will allow for more boom breakaway travel. This space is critical so as not to bottom-out the boom arm. See figure 3

Caution

You will do severe damage to your mower if you allow the boom arm to reach the bottoming-out point!

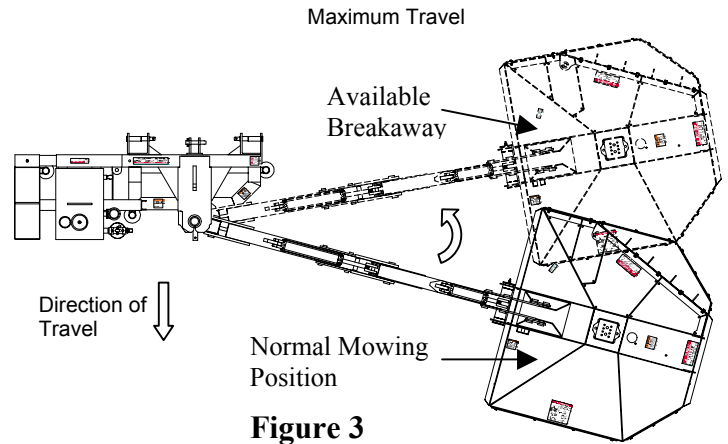


Figure 3

Caution

You must allow for the extra boom travel when mowing in reverse. See figure 3. If you have any questions about these instructions, please ask your local Hardee dealer immediately! Warranty claims for equipment used improperly will not be accepted.

Side Dressing Trees

The design of your heavy-duty brush mower will allow you to “side dress” trees if needed. To do this, raise the booms to the desired height and tilt the mowerhead to the vertical position. With the blades “on” move forward slowly, removing only approximately 12 inches of material per pass.

DANGER

Never operate the mower within 10 feet of overhead power lines or utility lines. Do not trim trees with power lines running through them. Serious injury or death by electrocution may occur.

Cutting Larger Brush and Trees

A unique feature on the LR50160 is the mowerhead “HINGED GATE”. The “HINGED GATE” is used when you need to remove trees as large as 4 inches in diameter. This is accomplished in the following manner:

- ✓ Be sure that the mower blades and tractor are turned “OFF”.
- ✓ Unlock the “HINGED GATE” by removing the two bolts. Refer to Figure 5 & 6 on Page 14.
- ✓ Replace one bolt on the main deck for storage and use the second bolt to lock the gate in its raised up position.

Operation Instruction



Figure 5

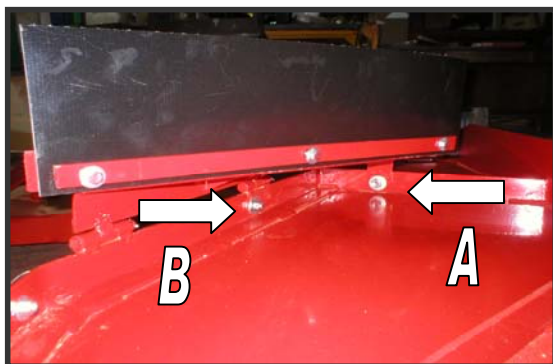


Figure 6

Figure 6 shows the two sets of bolts, nuts and washers that go on the “HINGED GATE”. Bolt A is used to lockdown the hinged gates to the LR50160 DECK when cutting trees and bolt B is tightened onto the deck for storage during the tree-cutting process.

 DANGER

Never attempt to use the cutter to remove brush or trees larger than 4 inches in diameter. Failure to use caution when cutting trees, may lead to the tree falling on the cutter deck and tipping the tractor over. We recommend removing small sections at a time, no more than two or three feet in length per pass. See fig. 5.

Unhook and Post Use Care

Before unhooking the tractor from your mower, always clean the unit thoroughly to remove any grass, mud or debris. This mower should always be stored on a hard level surface.

Unhooking the LR50160

- ✓ To unhook from your unit, first lower all jack stands to the storage position.
- ✓ Lower the tractor lift arms so that the mower will rest firmly and evenly on all jack stands.
- ✓ Lower the boom arms and mower deck so that they too rest firmly on the ground.
- ✓ Be sure to relieve all hydraulic pressure on the boom arms and deck before unhooking.
- ✓ Disconnect driveshaft from tractor.
- ✓ Disconnect joystick cable at the bulkhead connector on the wire cover box.
- ✓ Unhook tractor hitch from 3-point frame on mower

POST USE CARE

- Never leave the driveshaft hanging down and touching the ground.

Maintenance and Service Schedule

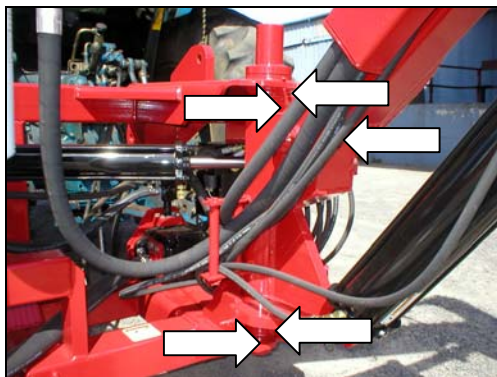
This section is dedicated to the maintenance of the LR50160. As with any piece of equipment, the performance and life span depends on the proper operation and maintenance.

⚠ DANGER

Never attempt any checks, repairs or adjustments with tractor engine running or the power take-off engaged. Adjustment of rotating parts while the tractor engine is running can result in serious personal injury or death if the PTO accidentally engages.

First Stage Boom

Inject with heavy multi-purpose grease. There are five grease fittings on the swing post.



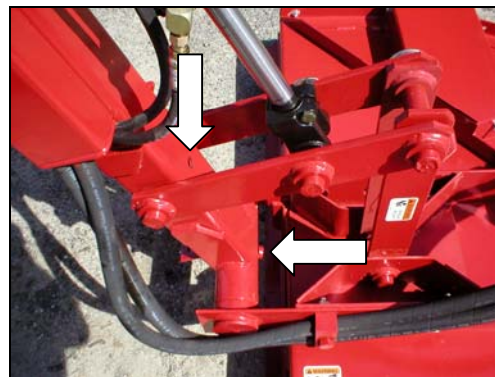
First Stage Boom to Second Stage Boom

Inject with heavy multi-purpose grease. There is a grease fitting at every hinge point.



Deck and Second Stage Boom

Inject with heavy multi-purpose grease.



Hydraulic Motor Housing Assembly

Locate fitting on motor housing. Inject with 90W gear oil.



Greasing PTO Driveshaft to Pump

Remove PTO shaft from mower before greasing. Use heavy multi-purpose grease at all grease fitting and on shaft. Remember to grease the shield grease fittings as well as the u-joints.



Inspection and Replacement of Blades

The mowing blades on the Hardee mower are designed and made to exact specifications and should be replaced with only original Hardee parts. Always replace blades in pairs to retain balance on the blade holder. Never weld the blades, as this will change the temper of the steel. Never modify the blades. Check for cross sectional thickness (1/2") and deterioration of blades. Replace as necessary.

When the replacement of mower blade is required, a few rules should be followed:

- Replace blades in pairs.
- Inspect bolt holes.
- If bolt holes are elongated, replace blade holder. *See instructions below.*
- Cutting heavy brush causes excess stress on the blade bolts, because of this they will require inspection that is more frequent.
- When replacing blades always replace bolts and nuts. Never reuse blade bolts and nuts.

Inspection and Replacement of Blade Holder

Inspection

- ✓ First, completely extend boom. Rotate mower deck all the way up; drop boom until deck rests on ground. Switch off tractor, secure parking brake and remove key.
- ✓ When inspecting, pay particular attention to any small hairline cracks between spindle bolt hole and blade bolt holes. This indicates metal fatigue from severe abuse and holder must be replaced.
- ✓ Blade and spindle bolts and nuts should be checked daily.

Replacement

- ✓ Remove cotter pin and castle nut.
- ✓ With an assistant, carefully remove the blade holder.
- ✓ Then position the new blade holder in place.
- ✓ Replace the castle nut and cotter pin. *See parts breakdown drawing on page 37 for reference.*

Checking the Mower Head Relief Valve

The LR50160 is equipped with a mowerhead relief valve that comes pre-set from the factory. This valve is installed in the side of the manifold and identified with the number "3". Before checking the pressure on the valve, make certain that a clean filter is installed and that the reservoir contains the correct amount of hydraulic oil.

The procedure to check the pressure on the mower head relief is as follows:

- ✓ Start the tractor and with the tractor in park, place the mowerhead on the ground. Engage the tractor PTO to power the mower head and increase engine speed until 800 (Max. 1000) PTO RPM is reached. Allow the mower to run at this speed for 3 to 5 minutes.
- ✓ Disengage the PTO and stop tractor engine.
- ✓ Remove the motor pressure line ("MP") and plug it. Install a 5000 psi pressure gauge into the 4-M-SAE outlet ("GP") adjacent to the relief valve. Place the loose pressure line in a clean container to catch any spillage.



Caution

Be sure all fittings are tight before proceeding!

- ✓ Start the tractor engine and increase engine speed to 1200 **ENGINE** RPM. Engage tractor PTO and immediately observe the pressure reading and disengage tractor PTO. (If pressure reads 2700 psi (+/- 150 psi), you may proceed.)
- ✓ Increase tractor engine speed to 800 (Max.1000) PTO RPM. Engage tractor PTO and immediately observe the pressure reading and disengage tractor PTO.

The correct pressure setting is 2700 psi. If the reading is less than 2550 or more the 2850, contact your local Hardee dealer for assistance.



Caution

Never let the unit operate in the capped position for over 5 seconds. A reading can be obtained accurately in this amount of time.

- ✓ Now you can remove the cap and gauge, and re-install the pressure line.

 **CAUTION**

Never vary from the 2700-psi mowerhead pressure. Failure to comply with this specification will cause severe hydraulic heat, loss of power and damage to components.

 **DANGER**

Exceeding 2700 psi will cause premature hose failure (rupture), and possible bodily injury or property damage.

Cylinder Speeds

The LR50160 is equipped with a “Proportional Control” feature in the main control valve that allows the operator to control the piston speed of individual cylinders with the amount of movement on the thumb actuated joysticks.

Adjusting the Cylinder Control Valve

The LR50160 comes from the factory with the cylinder control valve pre-set at the proper pressures. There is a main relief (Item P), and seven individual cylinder counterbalance valves (Items 5D2; 5D1; 5C2; 5C1; 5B2; 5B1; 8A2; 8A1). *The chart on page 18 lists the proper settings for these valves.*

The procedure for checking the pressures on the cylinder control valve is as follows:

Cylinder Relief Valve (ITEM P)

- ✓ Rest the deck of the LR50160 on the ground to relieve all pressures on the hydraulic lines.
- ✓ With the tractor engine off and parking brake set, remove the hydraulic test port plug (*see page 19 for gauge port locations*). Install a 5000 psi pressure gauge with a SAE 4-M-ORB fitting into the hydraulic test port and place the gauge where you can easily see it from a safe distance.
- ✓ Start the tractor and bring the engine up to operating speed 800 (Max.1000) PTO RPM. Activate the joystick, raise the mower deck off the ground, and swing the boom so that it is straight behind the tractor.
- ✓ Activate the joystick in the “HEAD UP” position until the deck cylinder fully retracts. Continue to hold the joystick in this position for not more than 5 seconds at a time, and have someone read the pressure on the gauge.

 **WARNING**

While reading the gauge, be careful not to stand in an area where inadvertent movement of the booms could trap or crush you. If you fail to heed this warning, **SERIOUS INJURY OR DEATH COULD OCCUR.**

The correct pressure setting for the cylinder relief is 2500 psi.

To increase or decrease pressure, insert a 1/4” allen-wrench into the adjusting stem at the top of the valve. Loosen the 3/4” lock nut at the base of the stem slightly, and then turn the adjusting stem to make your pressure change. Re-tighten the stem lock nut

Note: *The allen-head adjusting stem increases pressure when turned clockwise and decreases pressure when turned counterclockwise. Pressure increases or decreases rapidly with only a slight movement. Move adjusting stem in increments of 1/4 turn or less.*

 **CAUTION**

NEVER attempt to adjust the valve when in the “on” (loaded) position. Always make adjustments in the “off” (neutral) position with the tractor engine turned off.

When 2500 psi is obtained, retighten the jam nut. Then re-test the pressure to be sure 2500 psi is retained.

- ✓ When the adjustment is complete, rest the cutter deck back on the ground to relieve pressure in the hydraulic lines. Remove the pressure gauge and re-install the hydraulic test port plug.

Individual Cylinder Counterbalance Valves (5D2; 5D1; 5C2; 5C1; 5B2; 5B1; 8A2; 8A1;)

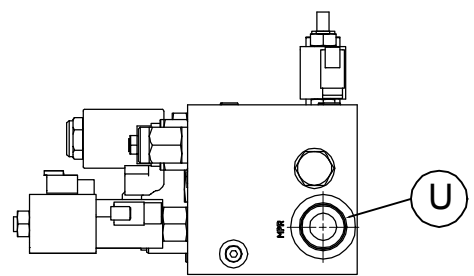
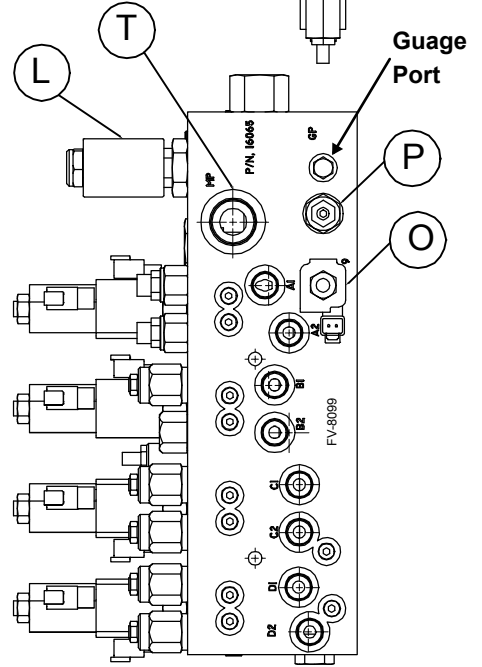
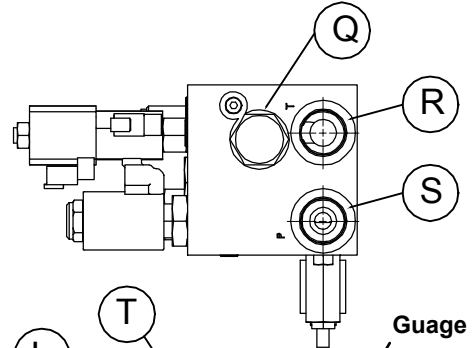
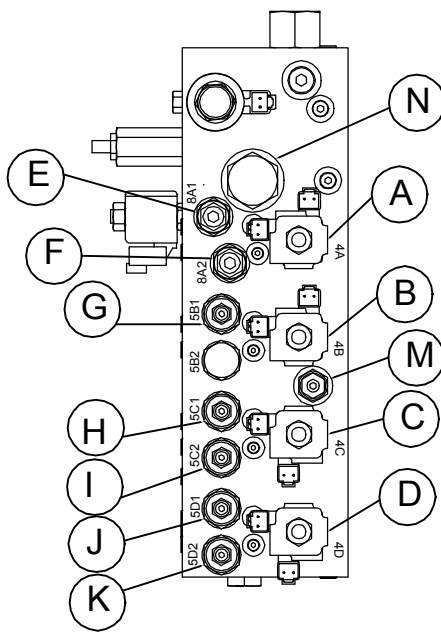
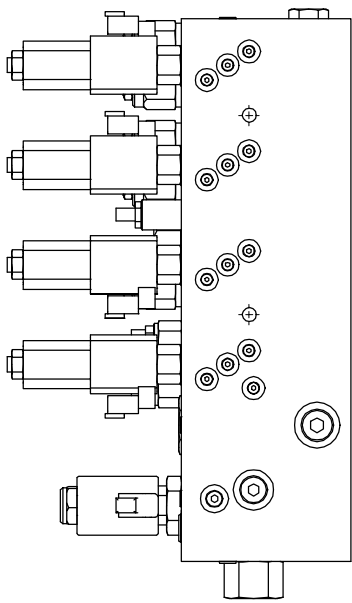
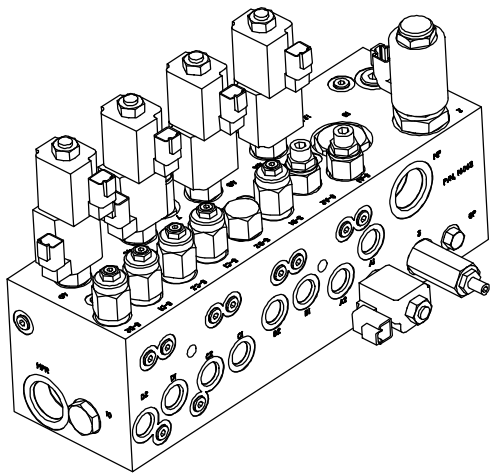
Each cylinder has counterbalance valves that provide both work port relief and load control. These valves are 100% inspected and pre-set from the factory to ensure the proper settings. Do not alter the settings on these valves.

If you need assistance, contact your local Hardee dealer.

Section 5
Maintenance

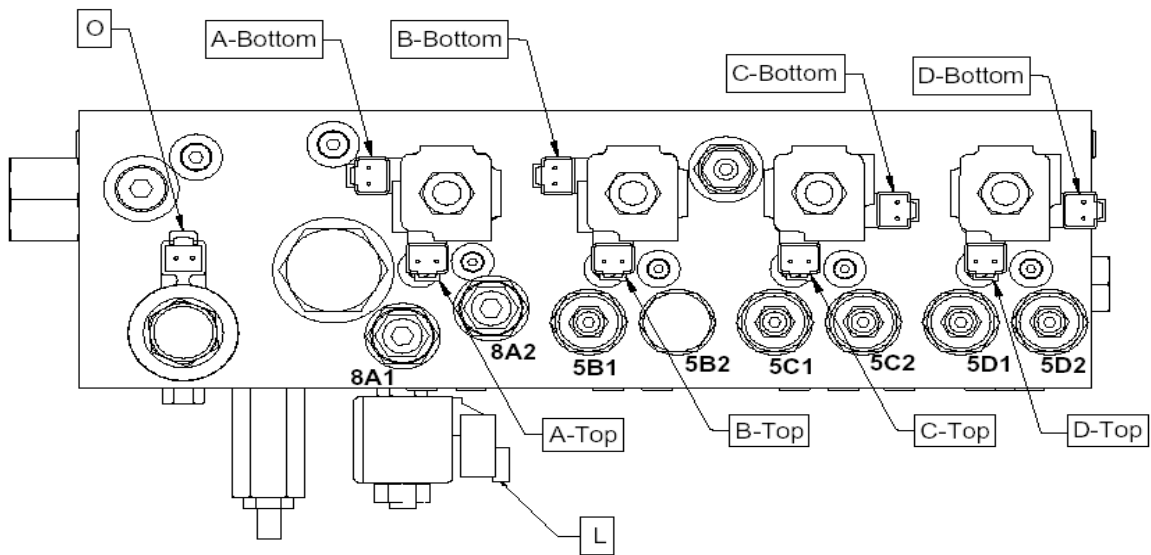
LR50160 CONTROL VALVE PORT LISTING							
Item	EVH P/N		Description	Code	Setting	Torque	Coil Nut
A	16262	Stem	Solenoid Valve (Deck Cyl. Control)	4A		25 ft lbs.	2.5 ft lbs.
	16263	Coil					
B	16262	Stem	Solenoid Valve (II stg Boom Control)	4B		25 ft lbs.	2.5 ft lbs.
	16263	Coil					
C	16262	Stem	Solenoid Valve (I stg Boom Control)	4C		25 ft lbs.	2.5 ft lbs.
	16263	Coil					
D	16262	Stem	Solenoid Valve (Swing Control)	4D		25 ft lbs.	2.5 ft lbs.
	16263	Coil					
E	16258		Counterbalance Valve (Swing Right)	8A1	1300 PSI	35 ft lbs.	
F	16258		Counterbalance Valve (Swing Left)	8A2	1300 PSI	35 ft lbs.	
G	16256		Counterbalance Valve (1st Stage Up)	5B1	2500 PSI	35 ft lbs.	
H	16256		Counterbalance Valve (2nd Stage Down)	5C1	1800 PSI	35 ft lbs.	
I	16256		Counterbalance Valve (2nd Stage Up)	5C2	3300 PSI	35 ft lbs.	
J	16256		Counterbalance Valve (Deck Down)	5D1	1800 PSI	35 ft lbs.	
K	16256		Counterbalance Valve (Deck UP)	5D2	3300 PSI	35 ft lbs.	
L	N/A		Proportional Flow Control	2		50 ft lbs.	
M	16259		Cylinder Relief Valve	7	2500 PSI	25 ft lbs.	
N	N/A		Check Valve	13		130 ft lbs.	
O	16260	Stem	Solenoid Valve (Deck Motor Control)	9		22 ft lbs.	
	16261	Coil					
P	16255		Main Relief	3	2700 PSI	37 ft lbs.	
Q	N/A		Pilot Opp. Dir. Valve	6		80 ft lbs.	2.5 ft lbs.
R	N/A		Return Port	T			
S	N/A		Pump Port	P			
T	N/A		Deck Motor Pressure Port	MP			
U	N/A		Deck Motor Return Port	MPR			
NOT SHOWN	16496		MAIN CONTROLLER				
NOT SHOWN	16278		JOYSTICK WITH WIRE HARNESS				
NOT SHOWN	16249		PROX SENSOR FOR SWING				

CONTROL VALVE PORT SCHEMATIC



Section 5
Maintenance

LR50160 Valve / Joystick Wiring Schematic					
Function	Valve Port	Coil	Wire Color (+)	Connector No.	Handle Position
Swing (Boom) Right	8A1	A - Top	White	C10	Right (E)
Swing (Boom) Left	8A2	A - Bottom	White	C9	Left (W)
1st Stage Up	5B1	B - Top	White	C17	Up (N)
1st Stage Down	5B2	B - Bottom	White	C16	Down (S)
2nd Stage Down	5C1	C - Top	White	C12	Down (S)
2nd Stage Up	5C2	C - Bottom	White	C11	Up (N)
Deck Down	5D1	D - Top	White	C15	Left (W)
Deck Up	5D2	D - Bottom	White	C14	Right (E)
Deck Motor	9	O	Black	C19	Any
Proportional Control	2	L	Black	C20	Any



Routine Maintenance Checklist

Interval	Item	Check	Lube	Change	Comments
Daily Or 10 Hours	Pump Drive Shaft		•		
	Pivot Points		•		
	Grease Fittings		•		
	Blades	•			Change If Damaged
	Blade Bolts (Blade To Disk)	•			
	Blade Holder Nut	•			
	Spindle Bolts (Spindle To Deck)	•			
	Main Frame And Deck Bolts	•			
	Rubber Shielding	•			Change If Damaged
Weekly Or 50 Hours	Hydraulic Return Filter			•	Change After 1st 50 Hours, Then Every 500 Hours
	Hydraulic Fittings	•			
Monthly Or 150 Hours	Tank Breather	•			
	Hydraulic Fluid Level	•			
Seasonal Or 500 Hours	In Tank And Return Hydraulic Filters			•	

Troubleshooting Guide

Hydraulic System, Blade System, Pump, Motor, Fluid Lines

Problem	Possible Cause	Solution / Correction
Cylinder Will Not Operate	No Power To Joystick	Repair / Replace Connections
	Fuse Blown Inside Lighter Plug	Replace Fuse
	Joystick Not Connected To A 12-Volt System	Connect To 12-Volt Power Supply
	Joystick Not Connected To Valve Proportional Valve Not Functioning	Examine Bulkhead Connection To Mower Repair Electrical Connections To Solenoid Or Replace Solenoid
Head Drifts Back When In Operation	Improper Counter Balance Valve Setting	Adjust Counter Balance Valves To Specifications (Refer To Pages 18 - 19)
	Cylinder Leakage	Repair / Replace Cylinders
Boom Drifts Down	Improper Counter Balance Valve Setting	Adjust Counter Balance Valves To Specifications (Refer To Pages 18 - 19)
	Cylinder Leakage	Repair / Replace Cylinders
Leaking Motor	Motor Seal Blown	Repair / Replace Seal And Check Filter For Blockage (Repair / Replace Filter)
Blades Loose Speed In Mowing	Improper Relief Valve Setting	Check Relief Valve Setting (Refer To Pages 18-19)
		Repair / Replace Relief Valve
Pump Whines	Worn Or Damaged Pump	Repair / Replace Pump (Make sure gate valve is open)
	Improper Oil In System	Replace Oil
		Requires Hardee Oil Part NO 23333 Or Comparable Oil With Proper Viscosity
	Pressure Setting On Relief Valve Too Low	Check Relief Valve Setting (Refer To Pages 18-19)
Motor Whines	Worn Or Damaged Motor	Repair / Replace Motor
	Improper Oil In System	Replace Oil
		Requires Hardee Oil Part NO 23333 Or Comparable Oil With Proper Viscosity
Pressure Setting On Relief Valve Too Low	Check Relief Valve Setting (Refer To Page 18)	
Motor Seal Continually Blows Out	Internal Popit Valve Damaged	Replace Popit Valves
Unit Vibrates Severely	Broken Blade	Replace Blades, Blade Bolts And Nuts (Refer To Page 16)
	Mismatched/Unbalanced Blades	Refer to Page 16
	Blade Holder Loose	Repair / Replace Blade Holder (Refer To Page 16)
	Loose Output Shaft	Repair / Replace Shaft's Bearings In Mower Head Housing
Mower Head Grinds And Roars When Operating	Worn Bearings Or Improper Lubrication In Mower Hydraulic Motor Housing	Repair / Replace Components (Bearing, Seals And Housing) As Required

Troubleshooting Guide, continued

Hydraulic System, Blade System, Pump, Motor, Fluid Lines

Problem	Possible Cause	Solution / Correction
Individual Cylinders Leak Down	Blown Or Worn Cylinder Packing	Repair / Replace Cylinder
Relief Valve Will Not Adjust To Specifications	Defective Or Worn Valve Seat	Repair / Replace Relief Valve And Adjust To Specifications
	Worn Pump	Replace Pump
	Gate Valve Closed	Open Gate Valve
	Hydraulic Valve Cracked Internally	Repair / Replace Valve
	Improper Oil	Repair / Replace Oil (Use Hardee Oil Part No. 23333)
No Power To Control Box	No Power To Joystick / Joystick Not Connected To A 12-Volt System	Connect To 12-Volt Power Supply
	Improper Connection To Joystick	Repair / Replace Connections
	Fuse Blown Inside Cigarette Lighter Plug	Replace Fuse
Filter Gauge Is In The Red At All Times	Filter Restricted	Repair / Replace Filter
	Bad Gauge	Repair / Replace Gauge
	Hydraulic Oil Too Heavy For Region Or Climate	Replace Oil
PTO Shaft Won't Telescope	PTO Shaft Not Lubed Properly	Lube Driveshaft (Per Daily Routine Check Sheet On Page 15)
	Bent Shaft	Replace PTO Shaft
Excessive Slack In Boom Hinges	Pins Worn	Repair / Replace Pins
Beams Squeak When Operating	No Lubrication Or Improper Lubrication	Lube Hinge Points (Per Instructions On Page 15)
	Defective Lube Fittings	Repair / Replace Fittings
Boom Operates Erratically	Speed Is Too Fast	Call HARDEE Dealer
	Defective Controller	Check Blink Codes on Page 24
	Air In Lines	Purge Hydraulic Lines
Blades Won't Start-Up	Oil Flow Restricted	Open Gate Valve
		Repair / Replace Hydraulic Lines
		Replace In-Tank Filter

Fault Codes for Status LED

Blink Code	Reason for Fault	Corrective Action
21	Left Joystick X axis Voltage out of range	Check Joystick and wires
22	Left Joystick Y axis Voltage out of range	Check Joystick and wires
23	Right Joystick X axis Voltage out of range	Check Joystick and wires
24	Right Joystick Y axis Voltage out of range	Check Joystick and wires
31	Stage 1 Down/Stage 2 Down Output Open or Short Circuit	Check valve coil and wires
32	Proportional Unloader Output Open or Short Circuit	Check valve coil and wires
33	Head Down/Swing Right Output Open or Short Circuit	Check valve coil and wires
34	Head Up/Swing Left Valve Output Open or Short Circuit	Check valve coil and wires
35	Cutter Head Motor Valve Output Open or Short Circuit	Check valve coil and wires
36	LED Output Open or Short Circuit	Check valve coil and wires
37	Stage 1 Up/Stage 2 Up Output Open or Short Circuit	Check valve coil and wires
38	Relay Driver Output Open or Short Circuit	Check relay and wires

How to interpret the “BLINK CODE”:

On the bottom of the Controller Box, locate two (2) LED's; one Red; one Green. Whenever the red LED lights up you may see the following “BLINKS”:

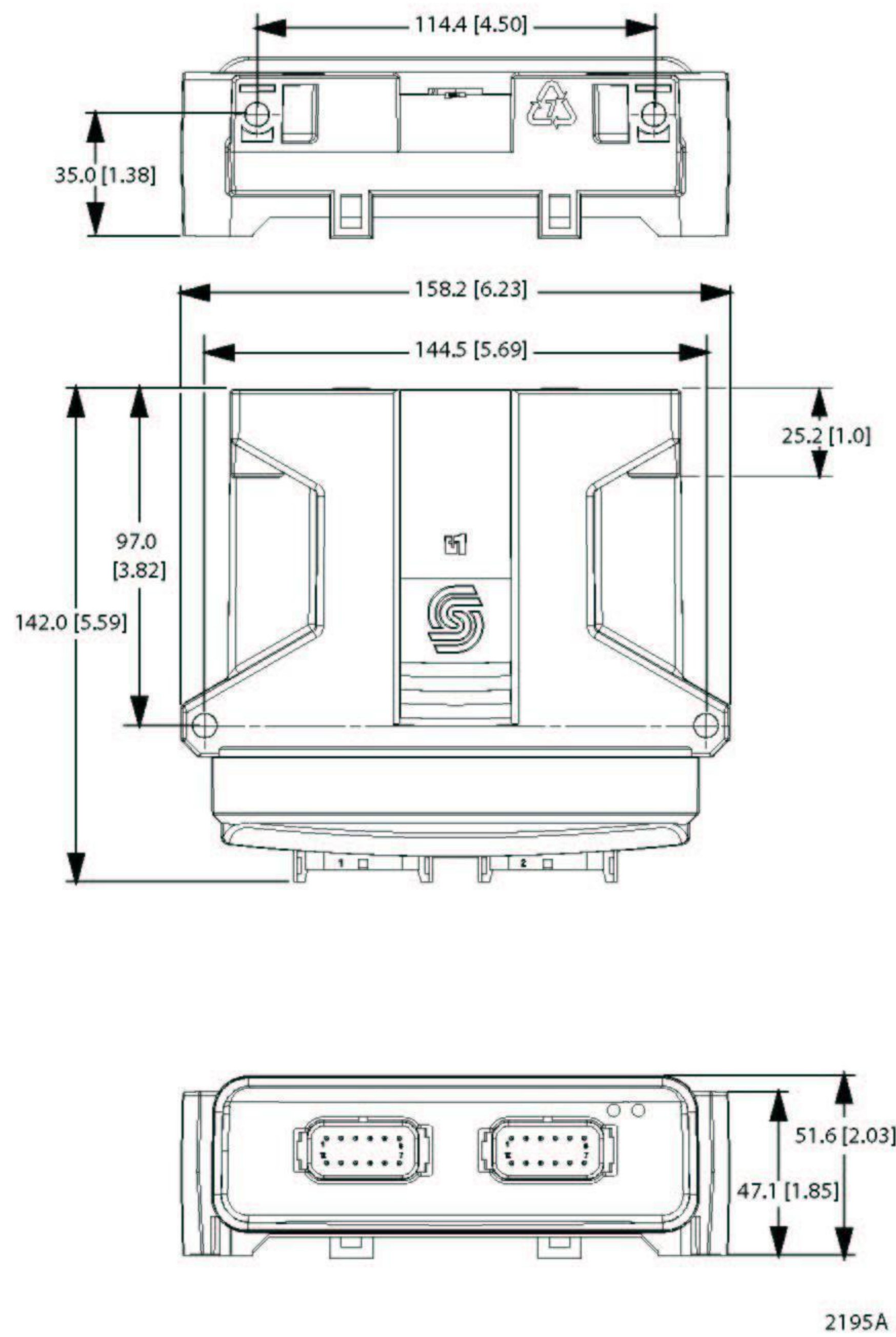
- (2) Red “BLINKS” – pause – (1) Red “BLINK” = “BLINK CODE” 21
- (3) Red “BLINKS” – pause – (6) Red “BLINKS” = “BLINK CODE” 36

ETC.

- Now check “Reason for Fault” and “Corrective Action” opposite the corresponding “BLINK CODE”.

MC024-020-00000 PLUS+1 CONTROLLER

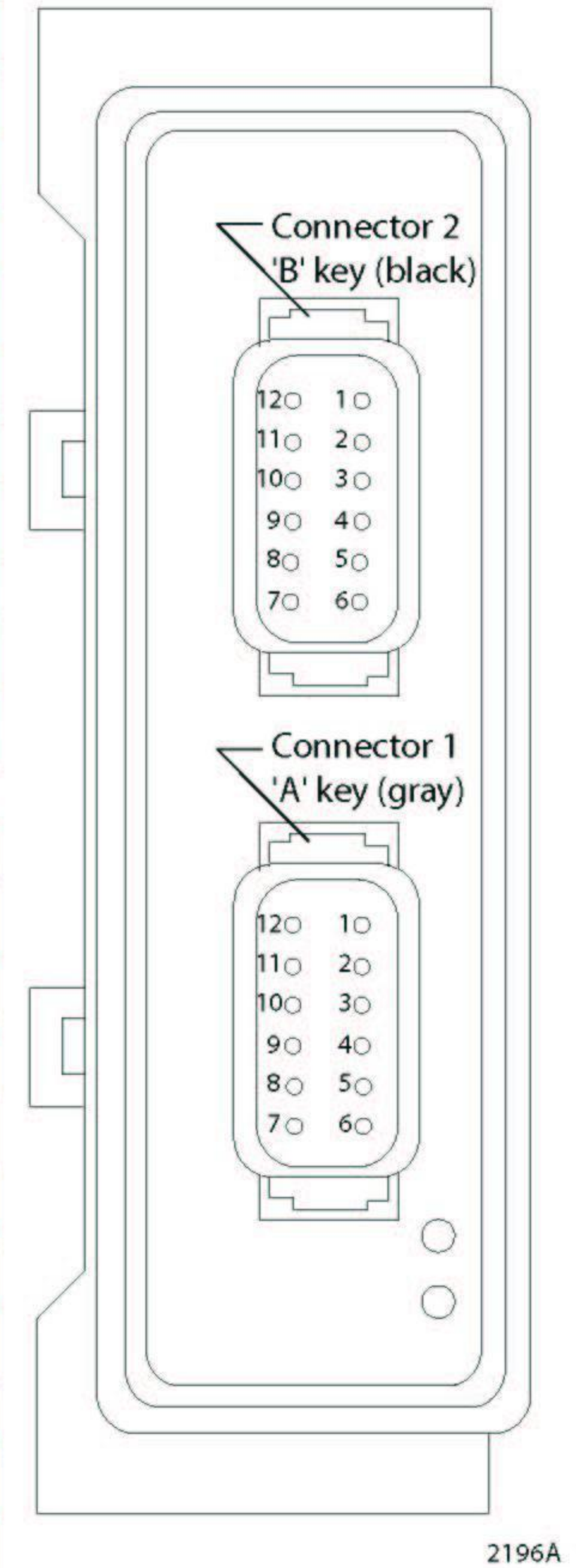
Dimensions and Pin Assignment



MC024-020-00000 mounting dimensions

DIN/AIN/FreqIN	C2-P1
DIN/AIN/FreqIN	C2-P2
PWMOUT/DOUT/PVG Power supply 1	C2-P3
PWMOUT/DOUT/PVG Power supply 2	C2-P4
PWMOUT/DOUT/PVGOUT 1	C2-P5
PWMOUT/DOUT/PVGOUT 1	C2-P6
PWMOUT/DOUT/PVGOUT 1	C2-P7
PWMOUT/DOUT/PVGOUT 2	C2-P8
PWMOUT/DOUT/PVGOUT 2	C2-P9
PWMOUT/DOUT/PVGOUT 2	C2-P10
Power Supply +	C2-P11
Power Supply +	C2-P12

Power ground -	C1-P1
Power supply +	C1-P2
CAN +	C1-P3
CAN -	C1-P4
AIN/CAN shield	C1-P5
DIN	C1-P6
DIN	C1-P7
5 V DC sensor power +	C1-P8
Sensor power ground -	C1-P9
DIN/AIN/FreqIN	C1-P10
DIN/AIN/FreqIN	C1-P11
DIN/AIN/FreqIN	C1-P12

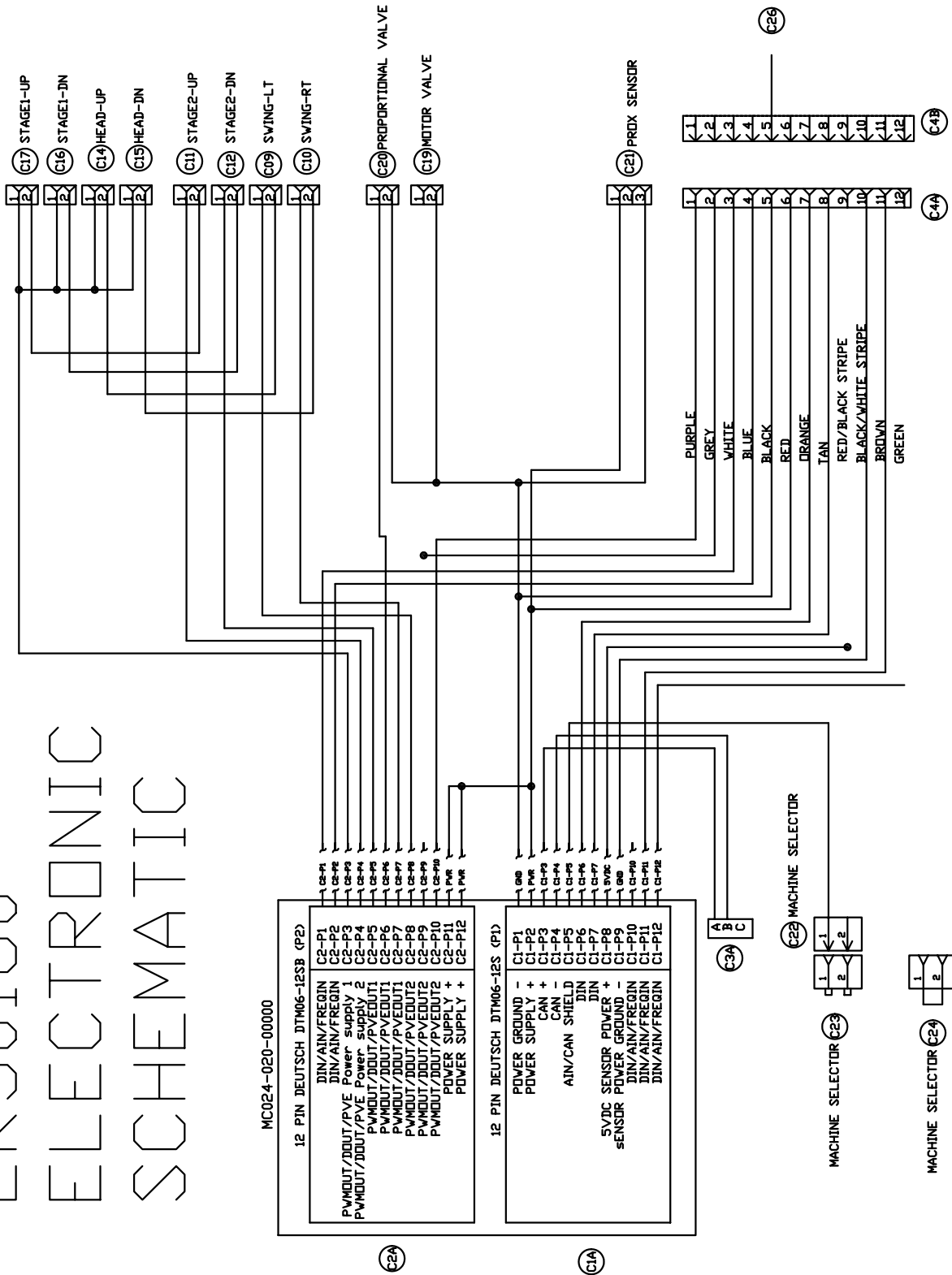


MC024-020-00000 24 pin connector

Specifications

Product Parameters	
Supply voltage:	9 to 36 V
Operating temperature (ambient):	-40 to 70° C
Storage temperature:	-40 to 85° C
IP rating:	IP 67
EMI/RFI rating:	100 V/M
Weight:	0.40 kg (0.88 lb)
Vibration:	IEC 60068-2-64
Shock:	IEC 60068-2-27 test Ea
Maximum current, sourcing:	24 A
Maximum current, sinking:	8 A

LR50160 ELECTRONIC SCHEMATIC



Summary of Specifications

Model	LR50160
Approximate Weight (lbs.)	Approximately 2,800 lbs. - Ready To Mow
Blade Tip Speed (ft/min)	540 PTO – 16,096 ft/min with pump # 22758 1000 PTO – 16,210 ft/min with pump # 22759
Blades	Heavy 5/8" X 5", Free Swinging
Mowing Capacity / Suggested Usage	Grass, Heavy Brush Up To 4" In Diameter
Mowing Width	60"
Deck Height	8 1/8"
Deck Thickness	10 Gauge
Driveline	Category 3
Driveline Protection	Hydraulic Relief Valve
Hitch	Standard Hitch, Category 2 Or 3 Quick Hitch
Motor	Hydraulic Vane Motor
Overall Length	272"
Overall Width	68"
Transport Width	86"
PTO Operating Speed	540 OR 1000 RPM
Pump	Hydraulic Spring Loaded Vane Pump
Rubber Shielding	Standard – Front & Rear
Skids	Standard – Weld On
Tractor HP Required	80 And Up
Hydraulic Oil System Capacity	35 Gallons
Controls	Tethered/Pendant Joystick Grip

Section 8- Replacement Parts

PARTS LISTING FOR LONG REACH MOWER LR50160			
Item	Part Number	Qty.	Description
1	10002	2	HEX BOLT (1/4" X 1" GR. 5 PLATED)
2	10006	4	HEX BOLT (1/4" X 3" GR. 5 PLATED)
3	10031	5	HEX BOLT (3/8" X 1" GR. 5 PLATED)
4	10034	2	HEX BOLT (3/8" X 2-1/2" GR. 5 PLATED)
5	10039	2	HEX BOLT (3/8" X 5" GR. 5 PLATED)
6	10052-540 rpm	4	HEX BOLT (7/16" X 2" GR. 5 PLATED)
	15452-1000 rpm	4	HEX BOLT (M12 – 1.75 x 50 GR. 8.8 PLATED) (FULL THREAD)
7	10071-540 rpm	4	HEX BOLT (1/2" X 1" GR. 5 PLATED)
	15453-1000 rpm	4	HEX BOLT (M14 – 2.0 x 25 GR. 8.8 PLATED) (FULL THREAD)
8	10072	2	HEX BOLT (1/2" X 1 1/2" GR. 5 PLATED)
9	10092	2	HEX BOLT (5/8" X 2" GR. 5 PLATED)
10	10093	2	HEX BOLT (5/8" X 2-1/2" GR. 5 PLATED)
11	10111	4	HEX BOLT (3/4" X 2" GR. 5 PLATED)
12	10154	1	LOCK NUT, 5/16", CENTER LOCK, GRADE 5, ZINC PLATED
13	10160	4	HEX NUT (1/4" PLATED)
14	10166	4	LOCK NUT, 5/8", CENTER LOCK, GRADE 5, PLATED
15	10168	10	LOCK NUT, 3/4", CENTER LOCK, GRADE 5, ZINC PLATED
16	10175	25	LOCK NUT, 3/8", CENTER LOCK, GRADE 5, ZINC PLATED
17	10176	16	LOCK NUT, 1/2", CENTER LOCK, GRADE 5, ZINC PLATED
18	10181	1	LOCKWASHER (5/16" PLATED)
19	10183-540 rpm	4	LOCKWASHER (7/16" PLATED)
	10197-1000 rpm	4	M12 LOCK WASHER
20	10184-540 rpm	4	LOCK WASHER (1/2" PLATED)
	10185-1000 rpm	4	LOCK WASHER (5/8" PLATED)
21	10185	2	LOCK WASHER (5/8" PLATED)
22	10186	10	LOCK WASHER (3/4" PLATED)
23	10200	2	FLAT WASHER (1/4" PLATED)
24	10202	22	FLATWASHER (3/8" PLATED)
25	10204	16	FLAT WASHER (1/2" PLATED)
26	10206	4	FLAT WASHER, USS (3/4" PLATED)
27	10207	17	FLAT WASHER 1-1/16" ID X 2" OD (PLATED)
28	10252	8	COTTER PIN (3/16" X 2" PLATED)
29	10335	5	PAINT, RED, FAST DRY
30	10336	0.250	GEAR OIL (GAL.)
31	OPEN	0	OPEN
32	10346	2	THREE POINT SNAP PIN (LYNCH PIN)
33	10368	1	1-1/4" GATE VALVE
34	10373	30	HYDRAULIC OIL, BULK (GAL.)(Rando HD 68)
35	OPEN	0	OPEN

Section 8- Replacement Parts

PARTS LISTING FOR LONG REACH MOWER LR50160			
Item	Part Number	Qty.	Description
36	10387	1	O-RING FOR 22833 & 23137 FLANGE
37	10390	3	CLIP PIN, 1/8" D X 2" L (FOR 10393 PIN)
38	10393	3	PIN, 1/2" DIA X 3" L, UNIVERSAL
39	10419	2	HITCH PIN, CAT 2 & 3
40	10448	2	3 X 17" TIE ROD CYLINDER/ SWING AND DECK
41	10454	1	4 X 24 TIE ROD CYLINDER, SPECIAL W/LONG ROD, NPT PORTS
42	10501	1	FLOW EZY BREATHER
43	10538	2	SLEEVE FOR CAT 2 & 3 PIN
44	10582	1	PRESSURE HOSE 3/8" X 55" LG. W/6-F-JIC (BOTH ENDS)
45	10583	1	3/8" SAE 100 R1 X 126" LG W/6-F-JIC SWIVEL BOTH ENDS
46	10584	1	PRESSURE HOSE 3/8" X 210" LG. W/6-F-JIC (BOTH ENDS)
47	10585	2	PRESSURE HOSE 3/8" X 83" LG. W/6-F-JIC (BOTH ENDS)
48	10587	1	PRESSURE HOSE 3/4" X 106" LG. W/12-M-JIC & #20 90 DEG. FLANGE
49	10866	1	PRESSURE HOSE 1" X 106" LG. W/16-M-JIC X 20 90 DEG. FLANGE
50	10872	3	PRESSURE FLANGE SET W/BOLTS, L.W. & SEAL (#20)
51	11005	1	DECAL, POPULATED AREA WARNING, 4" x 6-3/4"
52	11010	3	HARDEE BY EVH MFG CO, LOGO DECAL (4" X13.5")
53	11032	2	HARDEE BY EVH MFG CO, LOGO DECAL (2-1/4" X 8-1/8")
54	11675	1	RETURN FILTER KIT
	11767	1	RETURN FILTER (REPLACEMENT)
55	OPEN	0	OPEN
56	11848	1	O-RING FOR CURRENT DOG BONES
57	11850	1	WEB SITE DECAL
58	10071	2	HEX BOLT (1/2" X 1" GR. 5 PLATED)
59	13535	4	STAINLESS STEEL CLAMPS-FITS HOSE SIZE 1-1/2" TO 1-3/4"
60	13563	1	1-1/4" - M - NPT X 1-1/2" METAL HOSE BARB
61	13632	1	1/4" NPT CAP
62	13697	1	1-1/4" 90 DEG, BLACK , FEMALE ELBOW, PIPE FITTING
63	13758	1	1-1/4"-M-NPT X 1"-F-NPT REDUCER
64	13778	1	1 1/4" X 3 1/2" STEEL NIPPLE
65	13902	8	6-M-JIC X 8-M-ORB STRAIGHT
66	13905	8	6-M-JICX8-M-NPT ELBOW
67	13974	1	16-M-JIC X 16-M-NPT 90 DEG ELBOW
68	15242	1	HYDRAULIC VANE MOTOR (074)
69	15251	4	1" HOSE CLAMP HALVES
70	15252	1	3/4" SPECIAL HOSE CLAMP HALVES (SET OF 2)

Section 8- Replacement Parts

PARTS LISTING FOR LONG REACH MOWER LR50160			
Item	Part Number	Qty.	Description
71	15255	3	HOSE CLAMP COVER PLATE
72	15256	2	HEX BOLT (1/4" X 2 3/8" GR.5 PLATED)
73	15326	1	PRESSURE HOSE 3/8" X 17" LG. W/ 6-F-JIC BOTH ENDS
74	15338	1	DANGER DECAL, EXPOSED BLADES (HYD CUTTERS)
75	15339	1	PRESSURE HOSE 3/8" X 32" LG. W/ 6-F-JIC BOTH ENDS
76	15466	2	TUBING INSERT, 3-1/2" SQR. X 11 GAGE
77	15479	1	HYDRAULIC MOTOR HOUSING ASSEMBLY (6 BOLT DOG BONE)
78	15481	1	CASTLE NUT (1-1/4"-18UNEF)
79	15845	1	DECAL KIT
80	15852	2	RED REFLECTOR
81	15853	2	YELLOW REFLECTOR
82	15854	1	MANUAL HOLDER
83	15860	2	U-NUT 1/4"-20 FOR MANUAL HOLDER BRACKET
84	15910	46	SLEEVE, PROTECTIVE - BLACK (PS-B 47)
85	15928	1	CYLINDER, 4" X 24" WITH 2.0" ROD & 1" PINS
86	15968	1	COTTER PIN 6.3MM X 60MM
87	16065	1	CONTROL VALVE & JOY STICK KIT
88	16067	1	HOSE ASSY, VALVE TO PUMP, 1"
89	16068	1	HOSE ASSY, VALVE TO TANK
90	16070	8	3/8"- 90DEG. SWIVEL NUT ELBOW - 37DEG. FLARE / 37DEG. SWIVEL
91	16071	1	PRESSURE HOSE 3/8"X192" LG. W/6-F-JIC (BOTH ENDS)
92	16077	3	STRAIGHT FITTING - 1"
93	16084	2	SWIVEL NUT RUN TEE - 37 DEG. FLARE / 37 DEG. SWIVEL - 37 DEG. FL.(16R6X-S)
94	16086	1	REDUCER 37 DEG. FLARE (16-12 TRTXN-S)
95	16100	1	SIGHT GAUGE, 5" W/THERMOMETER
96	16138	2	LOCK NUT 7/16"-14 NC WITH NYLON INSERT
97	16191	2	1" STRAIGHT THREAD ELBOW (37 DEG FLARE/SAE-ORB)
98	OPEN	0	OPEN
99	16339	2	DECAL, MODEL
100	16344	1	OIL COOLER
101	16353	2	16-M-JIC-12-M-ORB ELBOW
102	16354	1	16-M-ORB/16-F-JIC
103	16379	1	HOSE ASSEMBLY 1"- OIL COOLER TO OIL FILTER
104	16390	1	HOSE ASSEMBLY 1"- 5 PSI RELIEF VALVE TO OIL FILTER
105	16392	1	PRESSURE HOSE 3/4" X 143" LG. W/12-F-JIC (BOTH ENDS)
106	16393	1	PRESSURE HOSE 1" X 153" LG. W/16-F-JIC (BOTH ENDS)

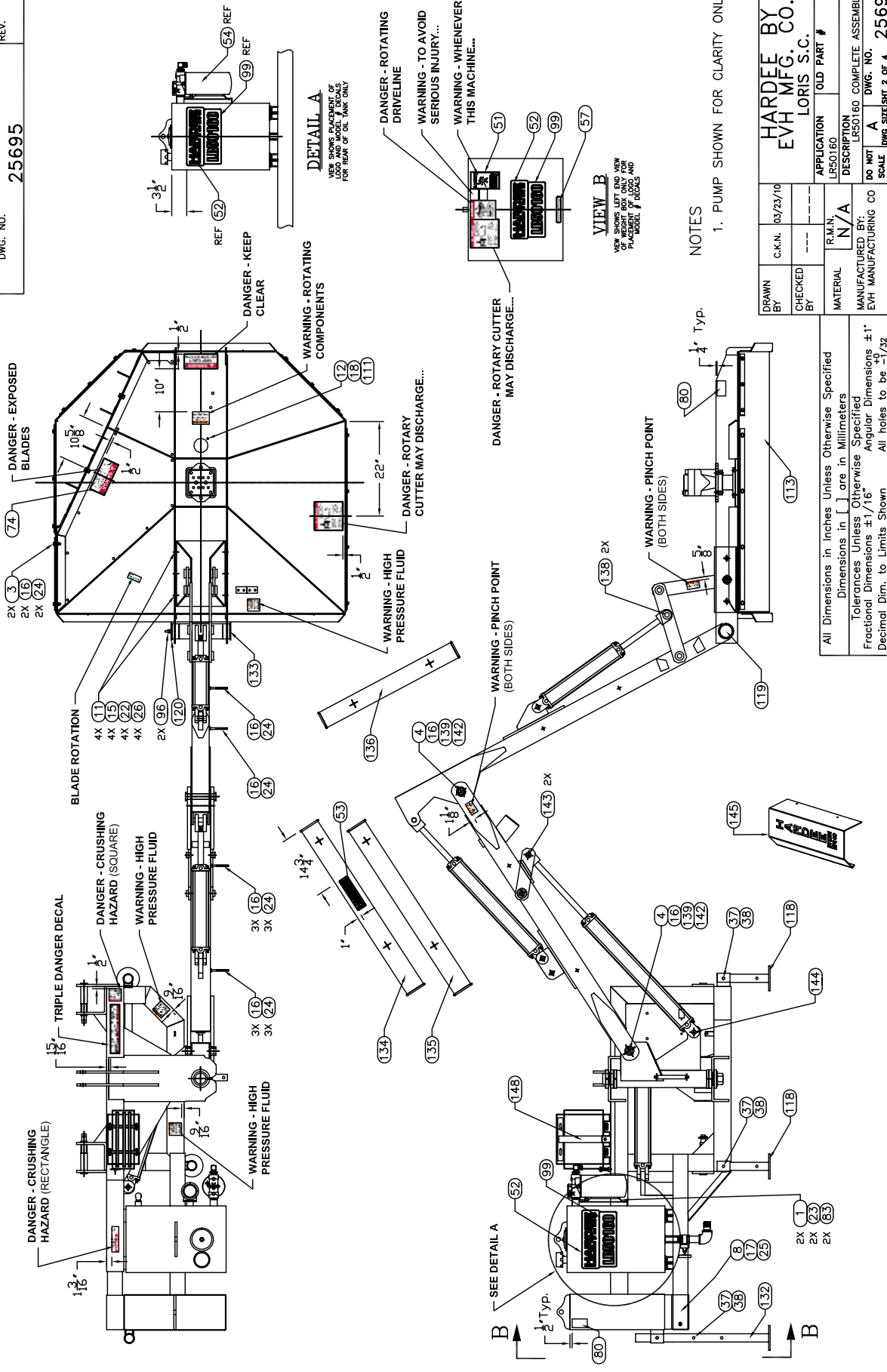
Section 8- Replacement Parts

PARTS LISTING FOR LONG REACH MOWER LR50160			
Item	Part Number	Qty.	Description
107	16404	1	CHECK VALVE- INLINE
108	16405	1	TEMPERATURE SWITCH
109	16431	1	WIRING HARNESS, OIL COOLER
110	16436	1	½" LOOP CLAMP
111	20031	1	ACCESS COVER
112	22710	1	FLAT, SHORT BELTING
113	22728	1	RUBBER BELTING KIT REAR
	22729	1	REPLACEMENT RUBBER BELTING REAR
114	22768	1	SHIELDING, 9X18, 2-HOLE, PVC 150 CBS BLACK
115	22770	1	BELTING EXTENSION KIT
	25775	1	REPLACEMENT BELTING FOR EXTENSION
116	22781	1	WELDMENT, DECK (6 BOLT)
117	22833	1	FLUID CONNECTOR WELDMENT
118	23038	2	WELDMENT, STAND
119	23130	1	PIVOT SLEEVE (2.6669 I.D. X 13 5/8" LG.)
120	23131	1	WELDMENT, END CAP
121	OPEN	0	OPEN
122	23232	1	SUPPORT BRACE
123	23280	1	WELDMENT, 1ST STAGE CYLINDER MTG BRKT CYLINDER BREAKAWAY
124	23287	2	WELDMENT, BOOM TO DECK BRACKET, (19")
125	23290	2	WELDMENT, BOOM TO DECK BRACKET, 21"
126	23292	1	PIN WELDMENT (1" X 5" LG)
127	23294	1	WELDMENT, 1ST STAGE BOOM
128	23310	1	WELDMENT, 2ND STAGE BOOM
129	23320	1	WELDMENT, CYLINDER MOUNT
130	23325	1	WELDMENT, WEIGHT BOX
131	23335	1	WELDMENT, OIL TANK, LR (STRAIGHT)
132	23340	1	WELDMENT, STAND, LR
133	23345	1	WELDMENT, HEAD MOUNT BRACKET
134	23349	1	WELDMENT, HOSE GUARD
135	23352	1	WELDMENT, INNER HOSE GUARD
136	23355	1	WELDMENT, HOSE GUARD
137	23361	2	SPACER 1 X 2-1/8
138	23363	2	SPACER (1" SCH 40 PIPE X 5/8")
139	23379	2	1-1/4" X 7-15/16" PIN
140	23380	1	WELDMENT, 1" X 6 1/4" PIN
141	23434	5	WELDMENT, 1" X 7-1/4" PIN

Section 8- Replacement Parts

PARTS LISTING FOR LONG REACH MOWER LR50160			
Item	Part Number	Qty.	Description
142	23457	2	BUSHING
143	25117	2	SPACER SPECIAL (1" SCH 40 PIPE X 7/8")
144	25724	5	WELDMENT, CYLINDER PIN
145	25725	1	WELDMENT, HARDEE LOGO
146	25795	1	BLADE HOLDER WITH BLADES
	15436	2	REPLACEMENT BLADES
	15437	2	REPLACEMENT BOLTS
	15438	2	REPLACEMENT NUT KIT (Nut, Lockwasher & roll pin for BB-29 bolt)
147	25798	1	HOSE, SUCTION(1-1/2" X 37")
148	25857	1	WELDMENT- OIL COOLER SUPPORT
149	25930	1	ASSEMBLY, HITCH FRAME
150	26855	1	WELDMENT- FAN GUARD FOR OIL COOLER

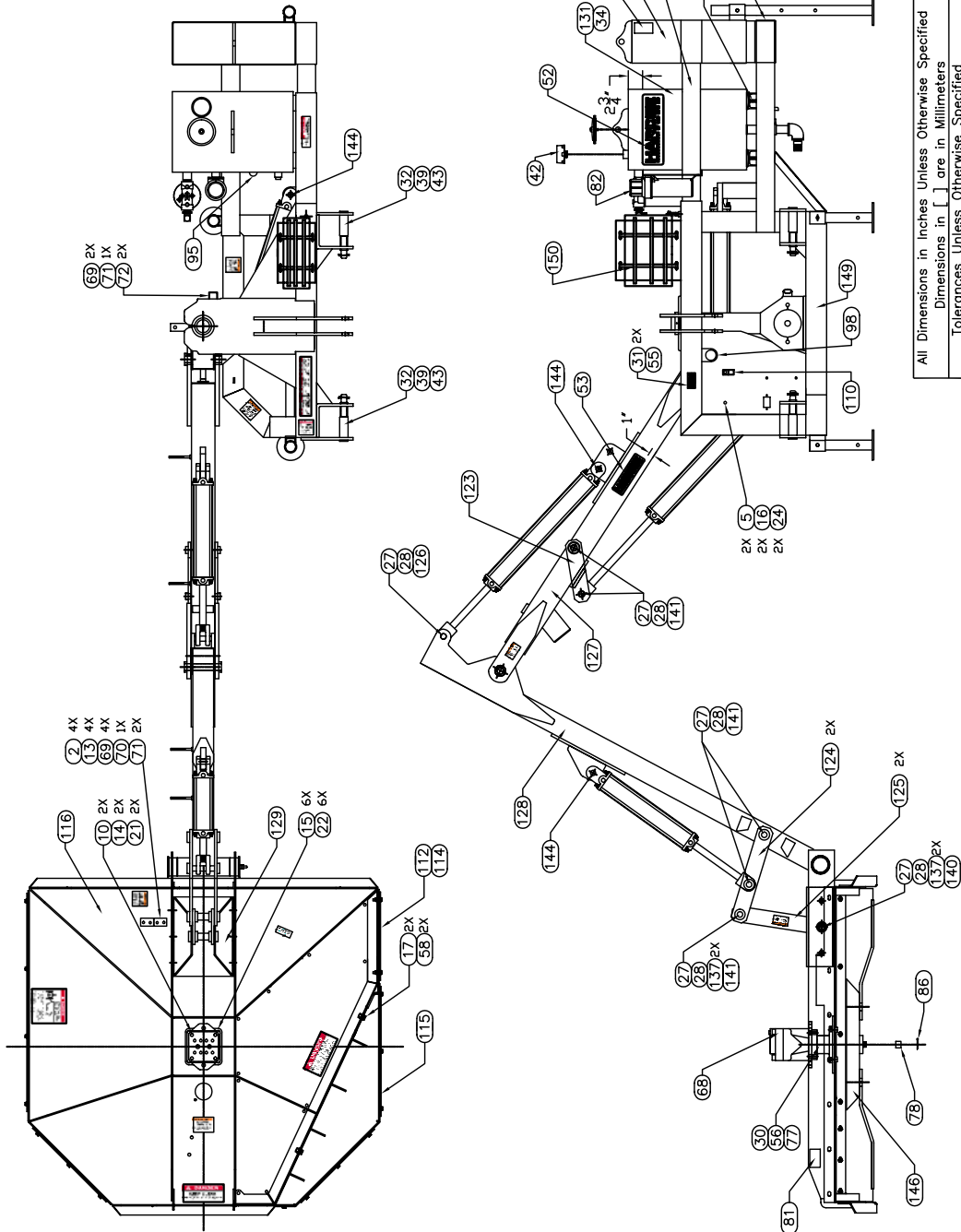
DWG. NO. 25695 REV. IR



DRAWN BY	C.K.N.	03/23/10	HARDEE BY	
CHECKED BY			EVH MFG. CO.	
MATERIAL	R.M.N.		LORIS S.C.	
MANUFACTURED BY	N/A		LR50160 COMPLETE ASSEMBLY	
MANUFACTURING CO			DO NOT SCALE	DWG. NO. 25695
				DWG. SHEET 2 OF 4

All Dimensions in Inches Unless Otherwise Specified
 Dimensions in [] are in Millimeters
 Tolerances Unless Otherwise Specified
 Fractional Dimensions ±1/16"
 Decimal Dim. to Limits Shown All holes to be -0.0025

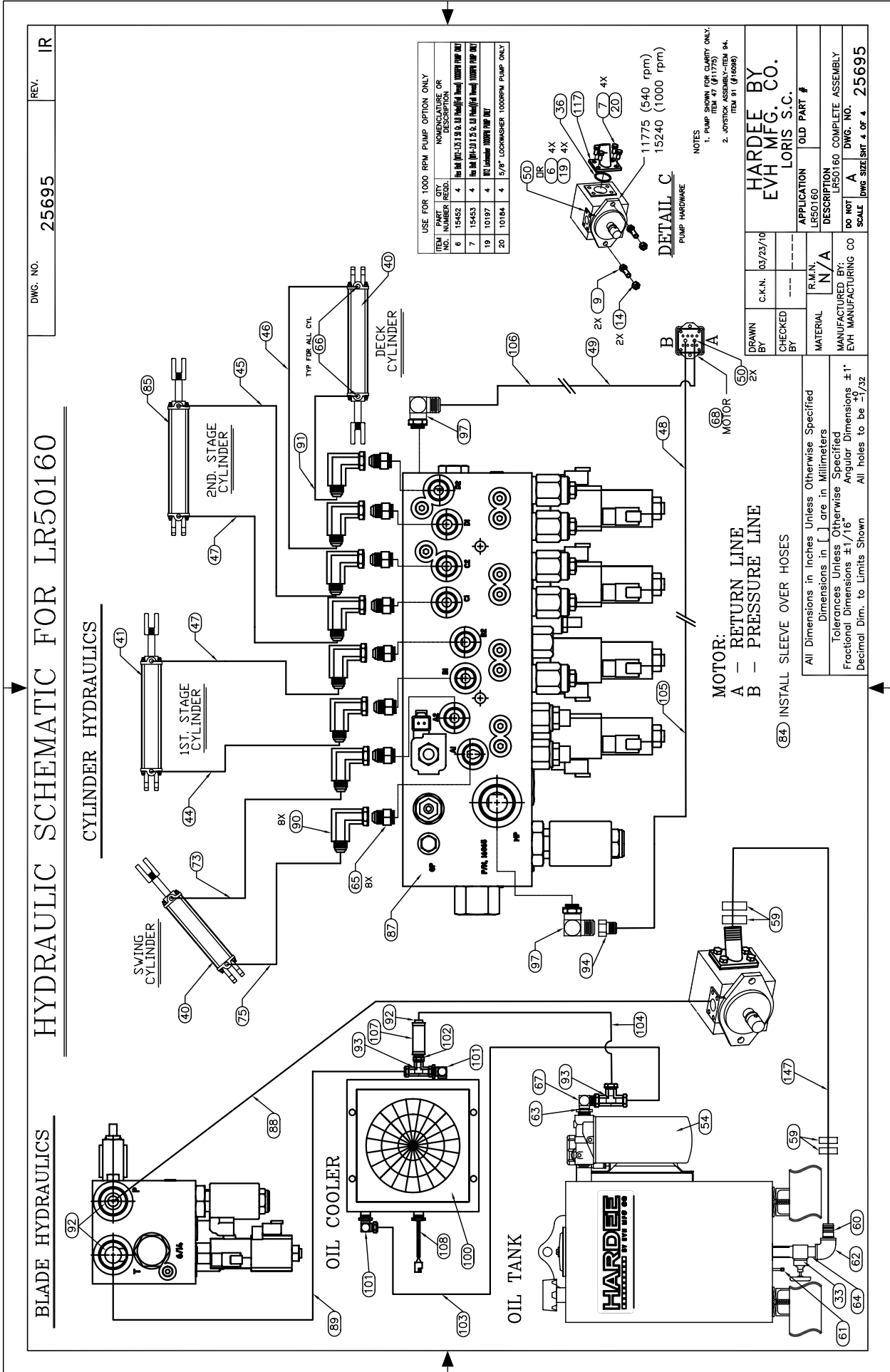
DWG. NO. 25695 REV. IR



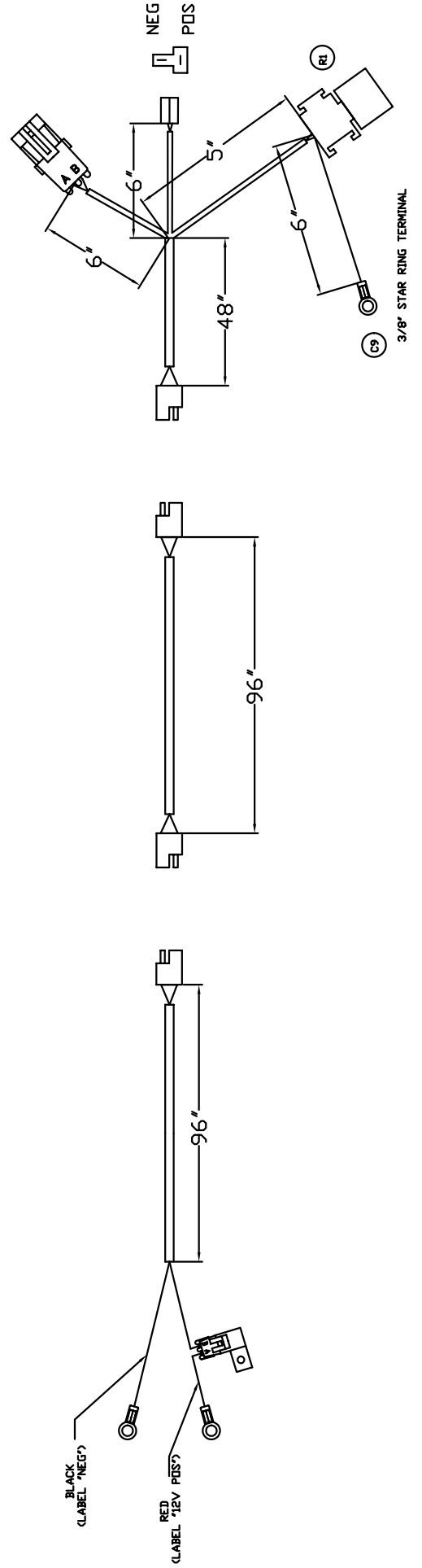
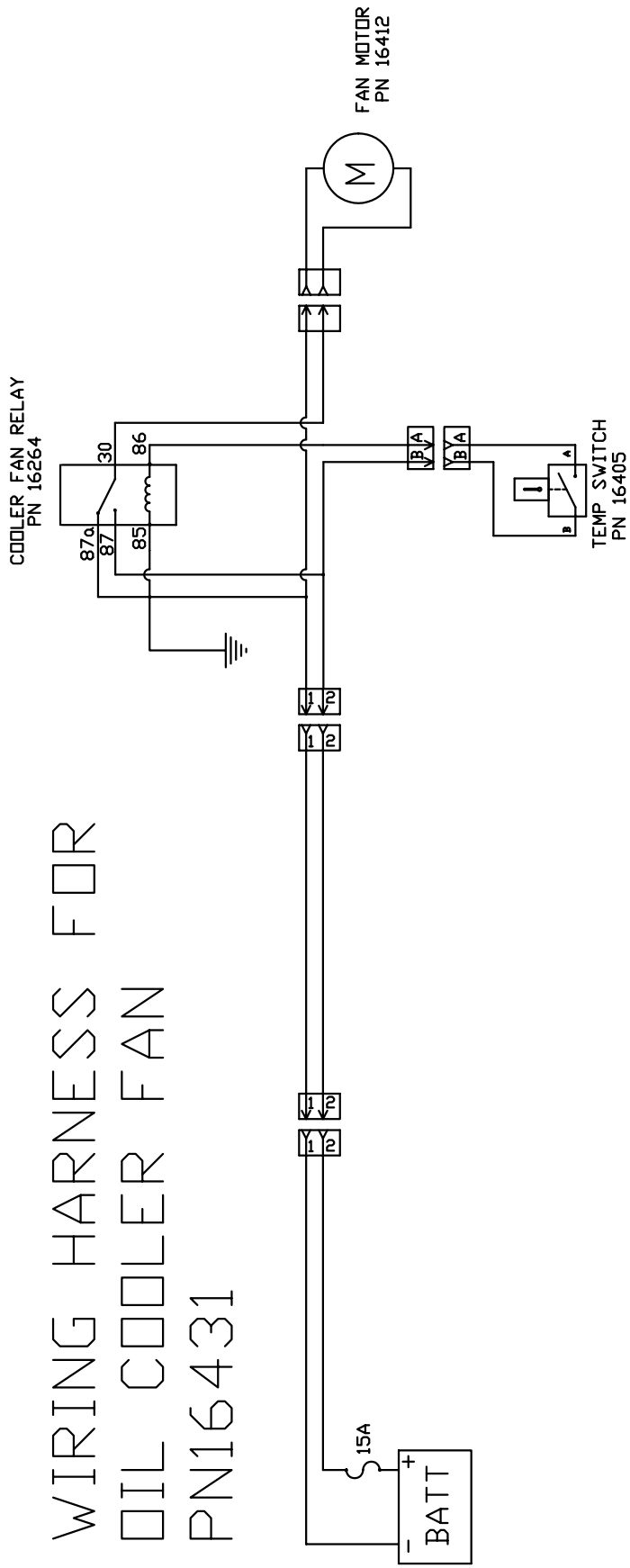
NOTES
1. PUMP SHOWN FOR CLARITY ONLY.

DRAWN BY	C.K.N.	03/23/00	APPLICATION	LR50160	OLD PART #
CHECKED BY			DESCRIPTION	LR50160 COMPLETE ASSEMBLY	
MATERIAL	R.M.N.	N/A	DO NOT SCALE	A	DWG. NO. 25695
MANUFACTURED BY:			EVH MANUFACTURING CO		
HARDEE BY			EVH MFG. CO.		
LORIS S.C.			DWG. SIZE: SHEET 3 OF 4		

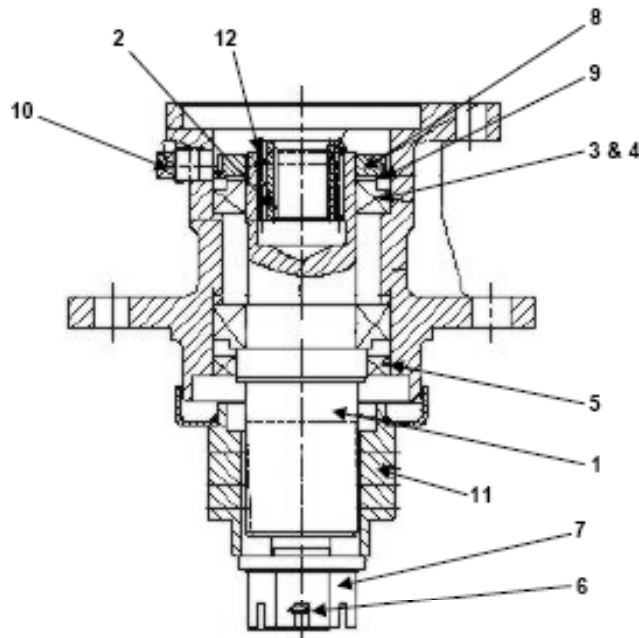
All Dimensions in Inches Unless Otherwise Specified
 Dimensions in [] are in Millimeters
 Tolerances Unless Otherwise Specified
 Fractional Dimensions ±1/16"
 Decimal Dim. to Limits Shown All holes to be ±1/32



WIRING HARNESS FOR OIL COOLER FAN PN16431



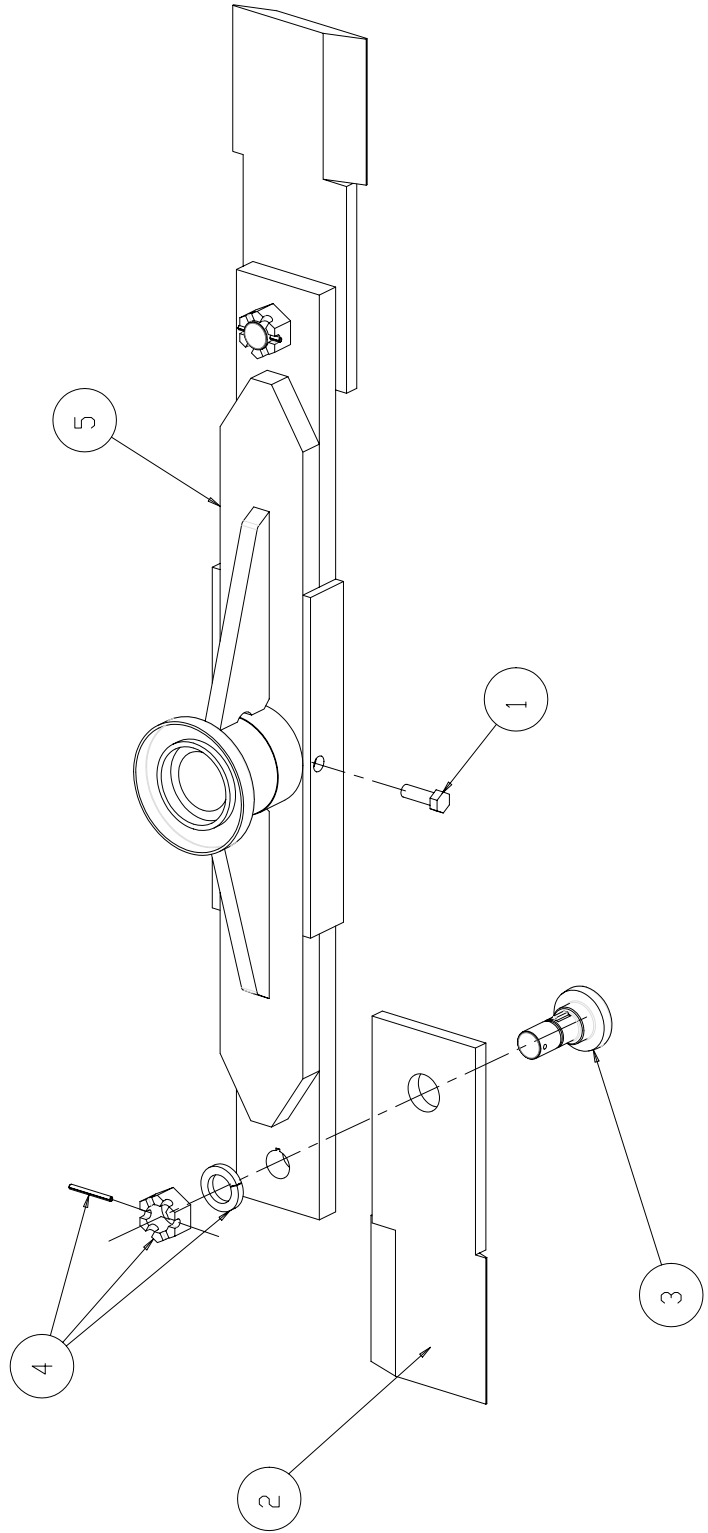
Hydraulic Motor Housing Assembly (Part # 15479)



Item No.	Part No.	Quantity	Description
1	15951	1	Shaft, MDH-65C Series
2	15964	1	Adaptor, Spline
3	15952	2	Bearing, Cup 32012
4	15953	2	Bearing, Cone 32012
5	15969	1	Seal, Output Triple Lip
6	15968	1	Cotter Pin 6.3mm x 60mm
7	15481	1	Hex Nut, Slotted 1-1/4" – 18UNEF
8	15966	1	Locknut, Bearing M60 x 2
9	15965	1	Lockwasher, M60
10	15784	2	3/8" Pipe Plug
11	15480	1	Extra Large Q-Hub for 2-3/8" Shaft
12	15970	1	Retaining Ring, External 45mm

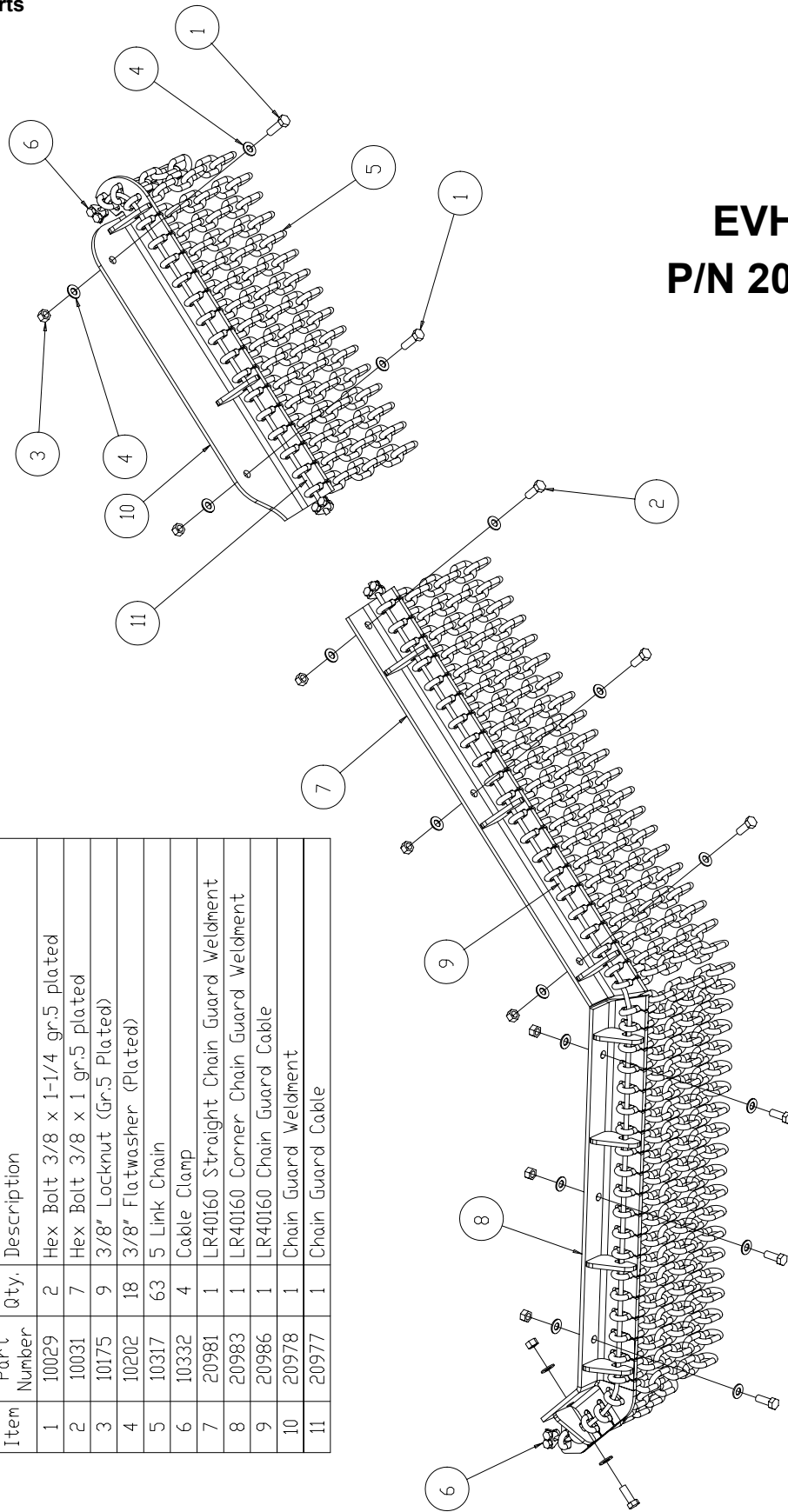
LR50160 BLADE
 HOLDER ASSEMBLY
 PN 25795

Item	Part Number	Qty.	Description
1	10072	1	Hex Bolt 1/2 x 1 1/2 gr.5 plated
2	15436	2	BLADE,5/8"X 5"X14-1/2",LR2160 & LR50160
3	15437	2	Blade Bolt for 5/8" Thick Blades
4	15438	2	Nut, Lockwasher & roll pin for BB-29 bolt
5	25796	1	BLADE HOLDER WELDMENT LR50160



LR50160 FRONT CHAIN GUARD

Item	Part Number	Qty.	Description
1	10029	2	Hex Bolt 3/8 x 1-1/4 gr.5 plated
2	10031	7	Hex Bolt 3/8 x 1 gr.5 plated
3	10175	9	3/8" Locknut (Gr.5 Plated)
4	10202	18	3/8" Flatwasher (Plated)
5	10317	63	5 Link Chain
6	10332	4	Cable Clamp
7	20981	1	LR40160 Straight Chain Guard Weldment
8	20983	1	LR40160 Corner Chain Guard Weldment
9	20986	1	LR40160 Chain Guard Cable
10	20978	1	Chain Guard Weldment
11	20977	1	Chain Guard Cable

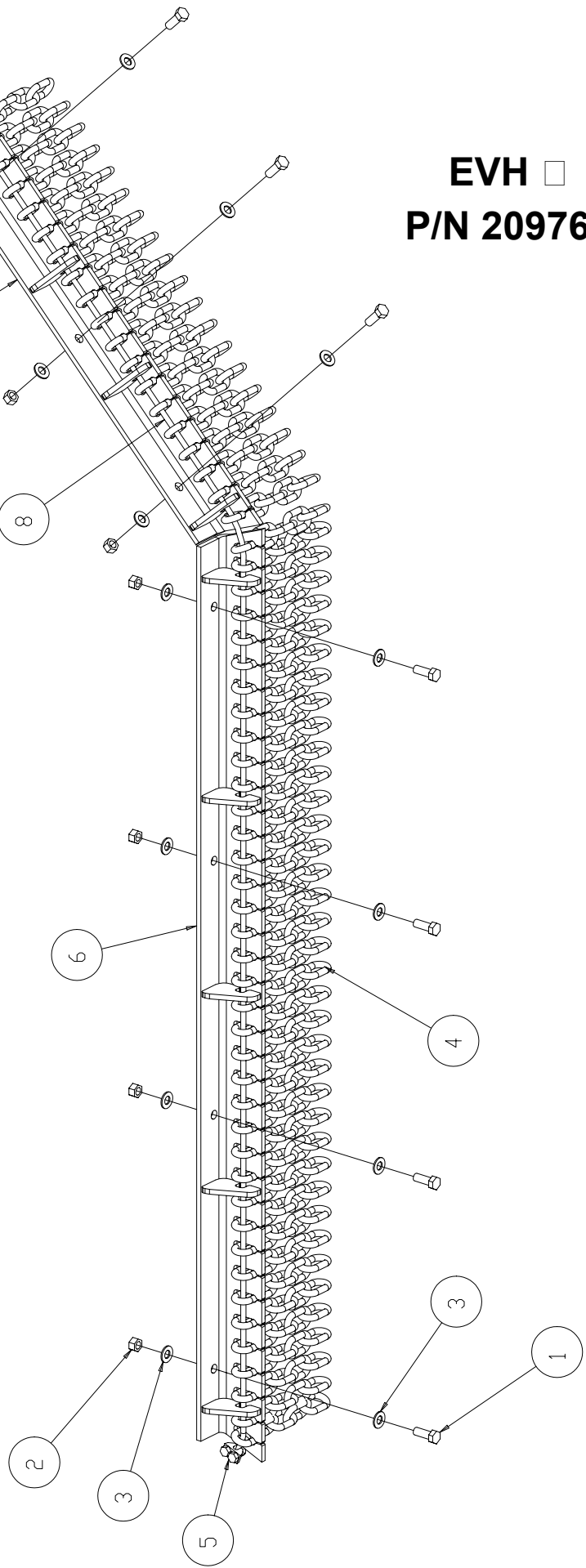


EVH
P/N 20980

Section 8- Replacement Parts

LR50160 REAR CHAIN GUARD

Item	Part Number	Qty.	Description
1	10031	7	Hex Bolt 3/8 x 1 gr.5 plated
2	10175	7	3/8" Locknut (Gr.5 Plated)
3	10202	14	3/8" Flatwasher (Plated)
4	10317	57	5 Link Chain
5	10332	2	Cable Clamp
6	20971	1	Straight Chain Guard Weldment
7	20973	1	Corner Chain Guard Weldment
8	20975	1	Chain Guard Cable



EVH □
P/N 20976

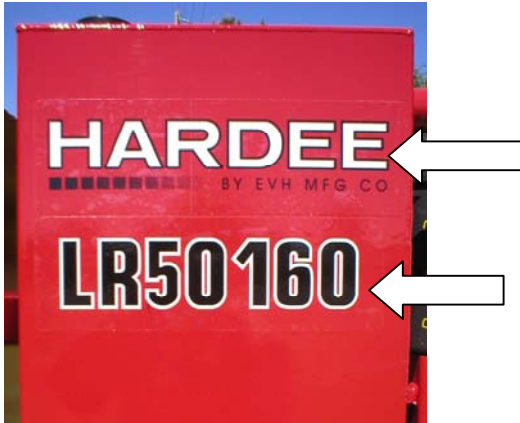
Logo Decals

If the original decals applied to your mower at the factory become worn or damaged, you can order replacements by referencing the examples below.

You can order new decals from any local Hardee dealer.

To apply the replacement decals:

- Clean the surface to place the new decal.
- Peel the decal away from the paper backing.
- Press firmly onto the clean surface.
- Squeeze out any air pockets using a straight edge.



OIL TANK



11010 – Logo Decal, 4" x 13 1/2"



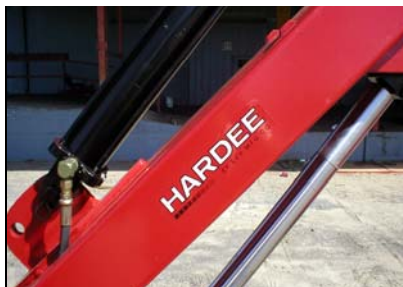
WEIGHT BOX



16339 – Model Number Decal



11850 – Web Site Decal

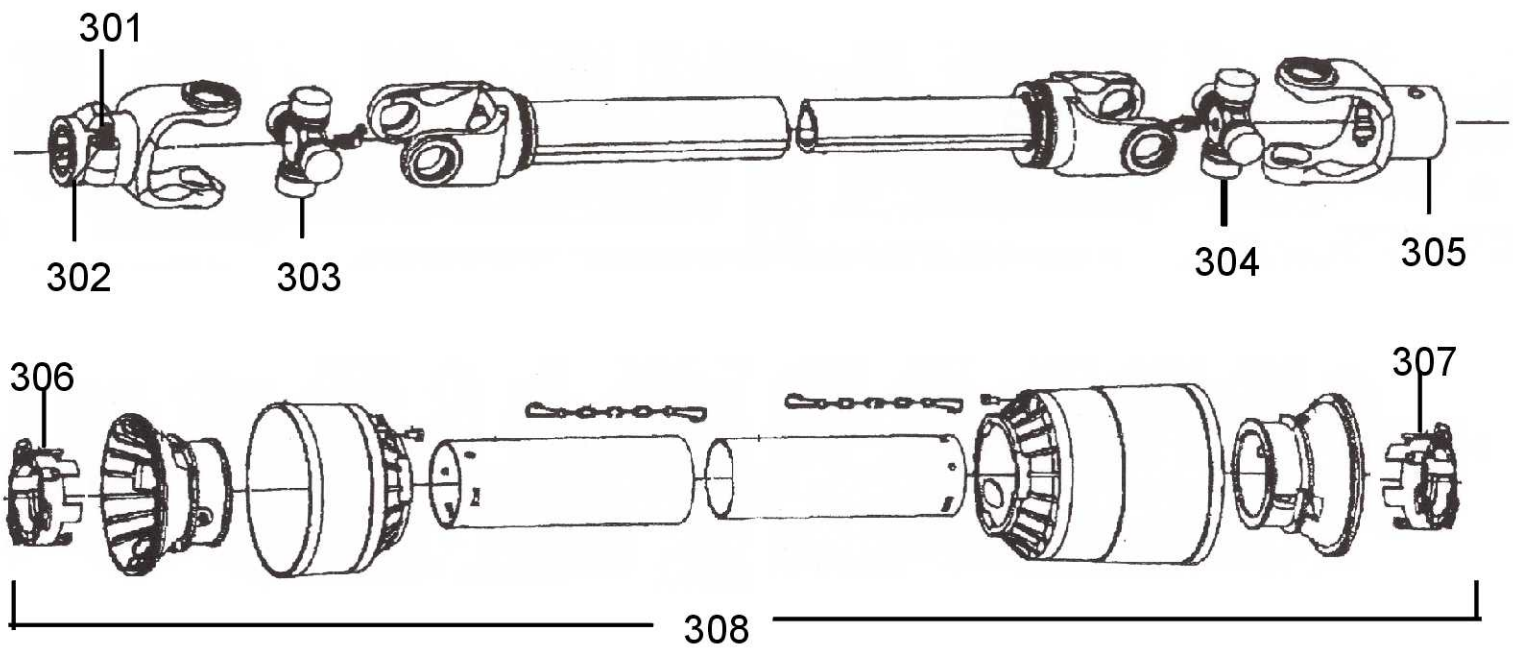


Hose Guard / 1st Stage Boom



11032 – logo Decal, 2 1/4" x 8 1/8"

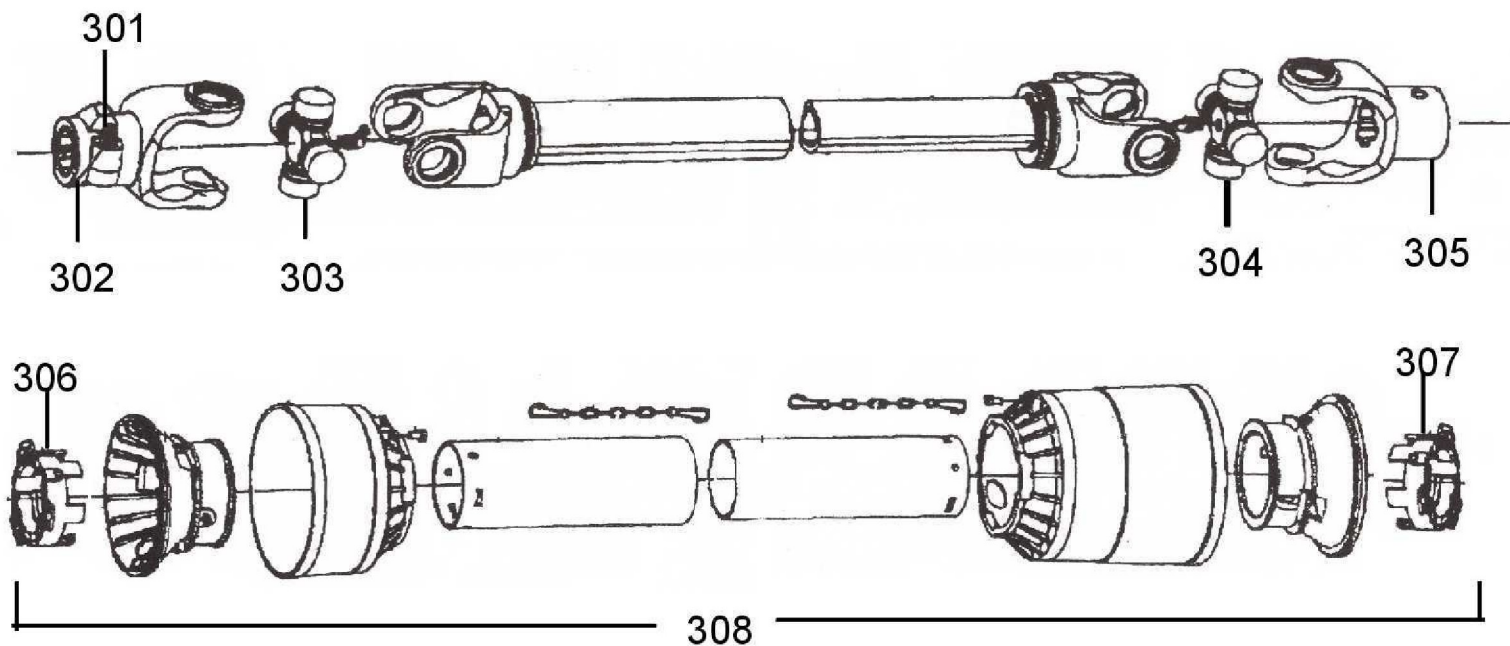
10601 Driveshaft



Key #	Part No.	Description	Key #	Part No.	Description
301	15579	Push pin complete	305	11443	Yoke, Imp end
302	11441	Yoke, Tractor end	306	15804	Shield bearing
303	11200	Cross kit	307	15805	Shield bearing
304	11200	Cross kit	308	11448	Shield kit complete

11716 Driveshaft

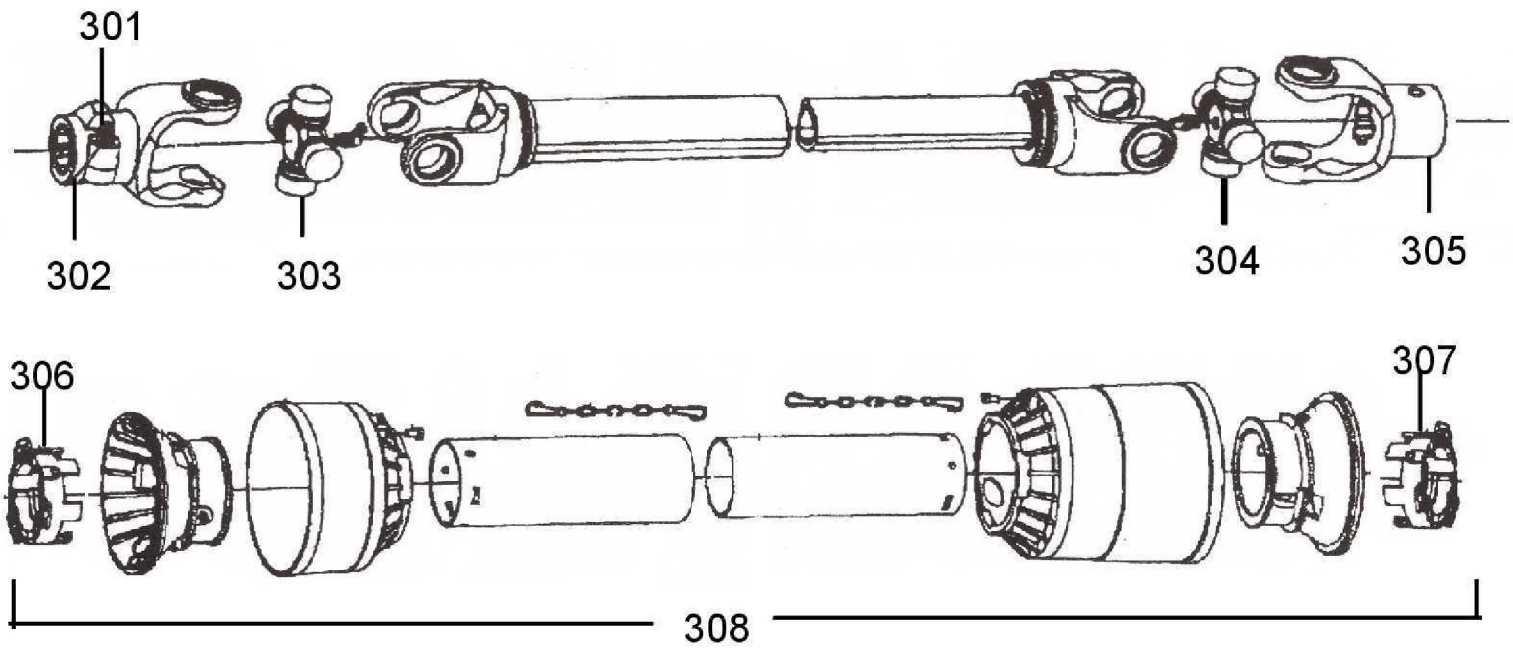
(1 3/4 20spline tractor end & 1 3/8 21spline Imp. end)



Key #	Part No.	Description	Key #	Part No.	Description
301	15779	Push pin complete	305	15807	1 3/8 21 spline yoke w/swell pin cat5
302	11855	1 3/4 20 spline yoke tractor end	306	15809	Shield bearing
303	15629	Cross kit	307	15810	Shield bearing
304	15629	Cross kit	308	15811	Shield kit complete

11717 Driveshaft

(1 3/8 21 spline yoke both ends)



Key #	Part No.	Description	Key #	Part No.	Description
301	15779	Push pyn complete	305	15807	1 3/8 21 spline yoke w/swell pin cat3
302	10969	1 3/8 21 spline yoke tractor end	306	15804	Shield bearing
303	11200	Cross kit	307	15805	Shield bearing
304	11200	Cross kit	308	11448	Shield kit complete

Bolt Torque

Checking Bolt Torque

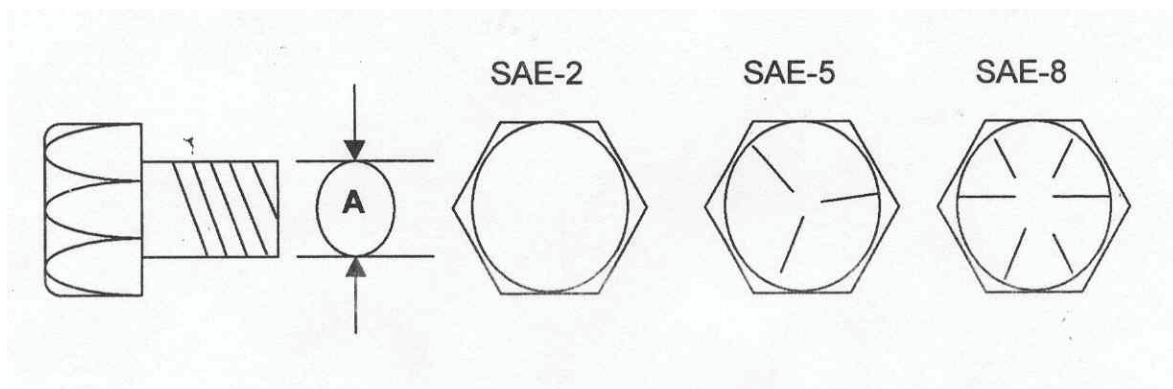
The table shown below gives correct torque values for various bolts and capscrews. Tighten all bolts to the torque specified in the chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength bolt. Torque figures indicated are valid for non-greased or non-oiled threads and heads unless otherwise specified.

Therefore, do not grease or oil bolts or capscrews unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

Torque value for bolts and capscrews are identified by their head markings.

Torque Specifications

Diameter "A"	Bolt Torque					
	SAE-2		SAE-5		SAE-8	
	LB-FT	N.m	LB-FT	N.m	LB-FT	N.m
1/4"	6	8	9	12	12	17
5/16"	10	13	19	25	27	36
3/8"	20	27	33	45	45	63
7/16"	30	41	53	72	75	100
1/2"	45	61	80	110	115	155
9/16"	70	95	115	155	165	220
5/8"	95	128	160	215	220	305
3/4"	165	225	290	390	400	540
7/8"	170	230	420	570	650	880
1"	225	345	630	850	970	1320



Hydraulic Mower Limited Warranty

Hardee warrants its **Hydraulic Mowers** for one year or **350 hours** (whichever comes first) to the original non-commercial, non-governmental, or non-municipal purchaser. And warrants for 90 days or 350 hours, to the original commercial, industrial or municipal purchaser, that the goods are free from defects in material or workmanship.

This limited warranty does not apply to any part of the goods which has been subjected to improper or abnormal use, negligence, alteration, modification, or accident, damaged due to lack of maintenance, wrong oil or lubricants, or which has served its normal life.

Hardee Hydraulic Mowers include the following units: CM2160, DB4048, DB4060, LR40142, LR40142-F, LR40148, LR40160, HR2360 and MR1442.

THEREFORE, EFFECTIVE JANUARY 1, 2010 WE ARE CHANGING OUR WARRANTY ON "HYDRAULIC MOWERS" AS FOLLOWS:

1. Standard Hydraulic Mower warranty will be one year or **350 hours** (whichever comes first) from the purchase date, to the original purchaser.
2. You may be able to purchase an additional 350-hour warranty at the expiration of the standard warranty, provided that. The warranty card is filled out and returned within **30 days** of purchase. No warranty will be allowed without a properly completed and returned warranty card.
3. And upon inspection, No evidence is found of improper or abnormal use, negligence, alteration, modification, accident, or damage due to lack of maintenance or use of wrong oil or lubricants. This warranty does not apply to expendable items such as blades and blade bolts, shields, guards and wear plates except as specifically found in your operator's manual.
4. Near the end of the first 90 to 120 day period, Someone from Service will visit your farm. The additional 350-hour warranty may then be purchased, upon acceptance by Service.
5. Cost of an additional **350 hour, (P/N 26025) is \$500.00.**

"Our obligation under this warranty shall be limited to repair or replacement of any part or parts of this implement which in our judgement shows evidence of such defect and provided further that said parts shall be removed and returned by the owner at the owner's expense to Hardee by EVH Manufacturing Co. LLC, Loris, SC, through an authorized dealer, transportation prepaid, free and clear of liens or encumbrances.

This warranty shall not include normal wear items.

Changes or alterations to the implement made without the **written** authorization of the manufacturer will render this warranty void. Tampering with or removal of the factory installed hour meter will void this warranty.

This warranty does not obligate this company to bear any labor costs in replacement of defective parts.

Hardee by EVH Manufacturing Co., LLC reserves the right to make changes or improvements in its equipment at any time, with the express understanding that such changes or improvements do not impose any obligation of the company to install such changes or improvements on implements previously manufactured.

Hardee Hydraulic Mowers are designed as **Agricultural** machines. They are designed to be used intermittently in **farm** use, **not** constantly as in "Commercial" use. Our machines are designed with brains instead of brawn, to fit the maximum number of tractors. They are not designed nor priced as Commercial machines that operate 8 hour daily / 5 days weekly.

The CM2160 is the exception to the above statement, having been designed as a Commercial machine.

IMPLIED WARRANTIES: You may have some implied warranties. For example, you may have an implied warranty of merchantability (that the hydraulic mower is reasonably fit for the general purpose for which it was sold) or an implied warranty of fitness for a particular purpose (that the hydraulic mower is suitable for your special purposes). This special purpose must be specifically disclosed to Hardee itself, and not merely to the dealer before your purchase, and Hardee itself, not just the dealer must approve, in writing that the special purpose is warrantable.

These implied warranties do not apply at all if you use your hydraulic mower for business or commercial use.

NOTES:

NOTES:



HARDEE BY EVH MFG. CO., LLC
4895 RED BLUFF ROAD LORIS, SC 29569
PHONE: 843-756-2555
www.hardeebyevh.com evhmfg@sccoast.net