



OPERATOR'S AND MAINTENANCE MANUAL

WITH PARTS LISTING

Ditch Bank Cutter

Model: DB4048/DB4060

FOR SERIAL #s STARTING

WITH 013054

RELEASED 1/10/17



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"/>	The Hydraulic and operational System Setup.	Page 9
<input type="checkbox"/>	Working safely with hydraulic lines.	Page 10
<input type="checkbox"/>	Check all fluid levels, tractor and cutter.	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 CUTTER IS NOT DESIGNED TO CUT TREES FROM TOP TO BOTTOM (VERTICALLY) WITH THE CUTTER DECK ON THE HORIZONTAL POSITION (SEE FIG. 1). The cutter is designed to trim branches with the cutter deck in the **VERTICAL** position while moving the tractor forward or backwards, repositioning the cutter deck after each path (see fig. 2).

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 and liability to any person and/or material when the cutter is operated in violation of the above information.**



Fig. 1



Fig. 2

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Introduction

To Our Customers

We at Hardee by EVH Manufacturing Company thank you for buying your new Hydraulic Rotary Cutter.

We have labored hard to build a cutter 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 cutter. 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 cutter 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 cutter is designed to perform specific functions.

In this manual, you will find instructions on cutter 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 cutter and therefore assumes no responsibility or liability for damage or injury resulting from the use of this machine.

The upkeep of the hydraulic cutter 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 cutter. 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 cutter.

Purpose of This Manual

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

If you need additional copies of this manual, please contact your local Hardee dealer or download a copy from our website at www.evhmfg.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 Cutter. If for some reason you have any questions about the information in this manual or have a problem with your cutter, 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 cutter. 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 cutter. You can find complete instructions for this cutter in the Operation Instruction section of this manual. We believe that using your cutter 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 cutters 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 cutterhead at any time. Never park the unit without placing the cutterhead 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 cutterhead or attempt to remove objects or branches from under the cutterhead while the tractor is running. Serious injury, loss of limb or death may result.

DANGER

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

WARNING

Never use the cutter for a 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 allow the cutter 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.

Safety Decals

Your Hardee cutter ships with all safety decals in place. They are located in areas on the cutter 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.

Safety Information



**Weight Box
and on Top of Deck**



**Weight Box
USE "DB4048"
&
"DB4060" DECALS**



Danger – Thrown Object
(P/N – 15845-16)



Danger – Rotating Driveline
(P/N – 15845-15)



Operating Safety and General Instruction
(P/N – 15845-15)



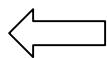
Warning – Thrown Object
(P/N – 11005)



**Danger – Keep Away
Rotating Blades**
(P/N – 11001)

Safety Information

Safety Decals, continued



Warning – Rotating Components
(P/N – 15845-10)



Hitch Frame



Danger – Crushing Hazard
(P/N – 15845-2)



Hitch Frame



Warning – High Pressure Fluid
Hazard
(P/N – 15845-11)

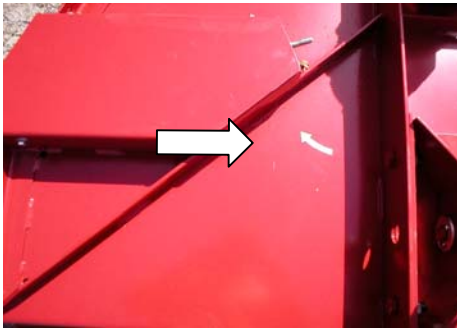


Hitch Frame



Deck

Safety Information



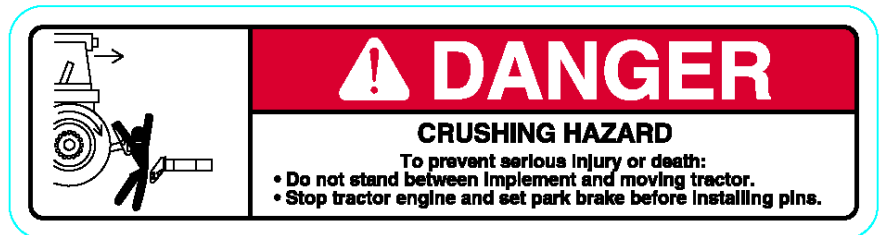
Deck



Blade Rotation
(P/N – 15845-4)



Hitch Frame



Danger – Crushing Hazard
(P/N – 15845-8)



Hitch Frame



Warning – Pinch Point
(P/N – 15845-3)

Safety Information

Safety Decals, continued



Deck



Danger – Keep Clear
(P/N – 15845-1)



Deck – Front/Rear

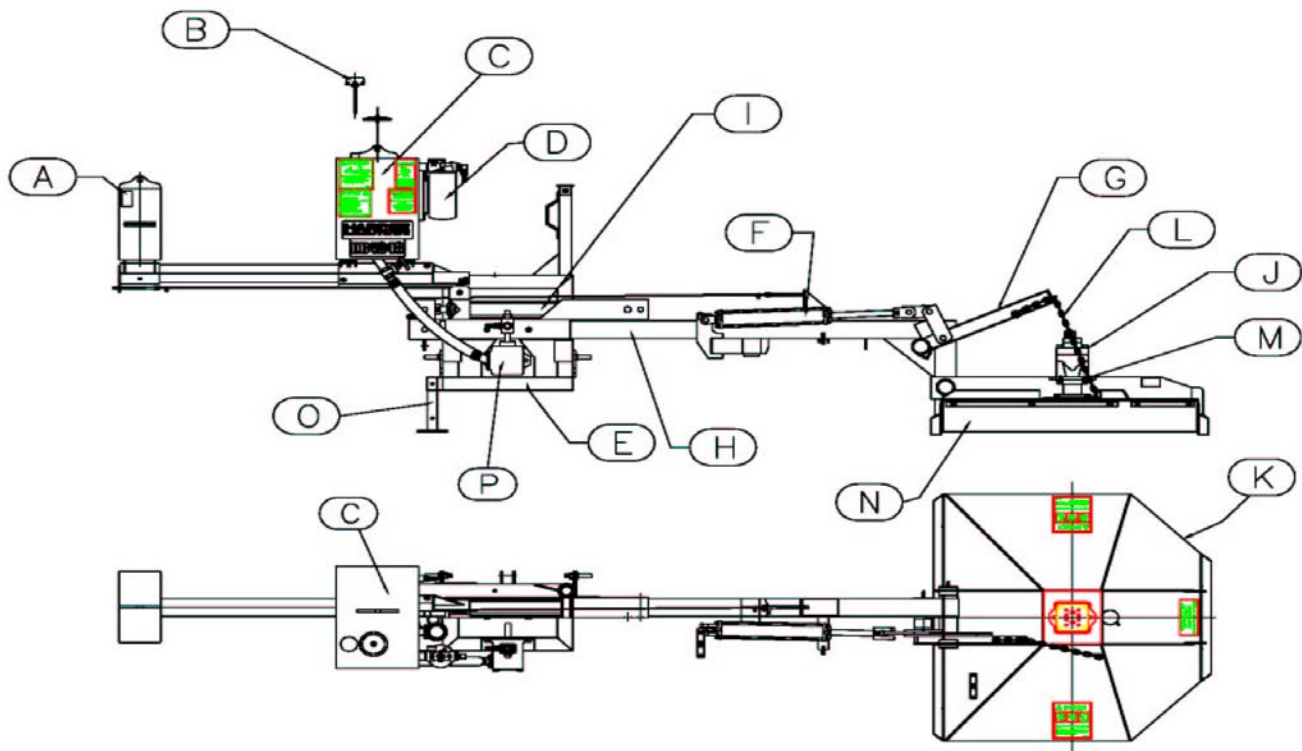


Weight Box – Front/Back

- 15852 – Red Reflector, Rear**
(Not Shown)
- 15853 – Yellow Reflector, Front**

Assembly and Installation

Component Identification and Terminology



A	Weight Box	I	Extension Cylinder
B	Dipstick	J	Hydraulic Motor
C	Oil Tank	K	Deck
D	Return Filter	L	Lift Chain Weldment
E	Hitch Frame	M	Motor Drive Housing
F	Deck Cylinder	N	Rubber Shielding
G	Lift Arm Assembly	O	Stand Weldment
H	Extension Arm	P	Hydraulic Pump

Assembly and Installation

Tractor Requirements

The Hydraulic Rotary Cutter you have purchased is designed for use with 45 horsepower; 4-wheel drive or 60 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 category 1 hitch for the DB-4048 or a category 2 quick hitch for the DB-4060.



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.



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 cutter. 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 cutter using anti-rotation chain.



Figure 1

Tractor Hook-Up Procedures

- ✓ Hook tractor 3-point hitch to cutter hitch frame. The DB-4048 is designed to work with a standard category 1 hitch. The DB-4060 works with a category 2 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 cutter 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.

Assembly and Installation

HYDRAULIC HOSE HOOK - UP



DANGER

Never use hands or skin to check for hydraulic leaks, use cardboard or wood. High-pressure oil leaks can penetrate skin causing injury and gangrene. Always wear safety goggles when working around high-pressure lines.

- Attach hoses to the cylinders and tractor remotes
- ✓ Raise jack stand before moving cutter.

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 and Operational Setup



IMPORTANT

The hydraulic system setup information contained in the following pages should be used only as a guide.

- Tractor lift should be in good working order.
- Check for moisture accumulation in hydraulic oil tank (item 81 on 22700 and 22720) before operating cutter by draining a small amount of oil into a container through the drain pipe located on the underside of the oil tank (loosen pipe cap).
- Check oil level with sight gauge located on the side of hydraulic oil tank. If oil is needed, HARDEE special hydraulic oil, part No. 23333, is recommended.
- PTO coupler should be tight and secure.



CAUTION

- Be sure cutoff valve (item 33, on drawings 22700 and 22720) is open before operating cutter.
- Adjust telescoping stand (item 13, on 23162) to desired height for easy reach of control valve (item 7 on 23162) from tractor seat.
- Before cutting, run cutter a short time at a low speed to warm oil. Operate cutter head in all cutting positions to make sure all moving parts are operating normally.
- Cable-Tension – Occasionally, it will be necessary to remove slack cable on DB-4048 and DB-4060. With arm fully retracted, loosen lock nut (Item 15, on 22700 and 22721) and tighten tension nut (Item 12, on 22700 and 22721) until taut. Be sure to retighten lock nut. (Item 15).
- To extend or retract cutter extension arm Models DB4048 & DB4060. Activate extension cylinder (I) on page (7) to desired position. (Counter weight moves automatically on Models DB4048 and DB4060).
- To adjust cutter head angle, activate deck cylinder (F) on page (7).
- Operate tractor PTO speed between 500 – 600 RPM's for best cutting results.
- Refrain from fast speeds over rough terrain.
- If cutter stalls on heavy cutting, raise head to clear obstruction, and allow it to regain cutting speed.
- When cutter is not in use, turn off oil flow valve (Item 33, on 22700 and 22721).
- To prolong life of cutter, store under shelter, to protect it from the weather.
- A stand weldment (page 7) is mounted to frame so cutter may be stored with cutter head in a down position.

Assembly and Installation

Hydraulic System and Operational Setup, continued...

If you have any questions, consult your local Hardee dealer.

Working Safely with Hydraulic Lines

Purge all air from hydraulic system before attempting to raise or lower the cutter deck, and extending or retracting the extension arm.



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.

Operation Instruction

Operation Instructions

During Operation



WARNING

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

Before any operation of the cutter, be familiar with the locations and functions of the unit's controls. Being familiar with the cutter 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 cutter. Speed and skill will be attained much more easily if the necessary time is spent to familiarize yourself with the cutter 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 unit's 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 & Cutter, <i>For best results, use Hardee hydraulic oil – part number 23333</i>	-
<input type="checkbox"/>	Grease Points	Page 13
<input type="checkbox"/>	PTO Shaft, Check Grease	Page 13
<input type="checkbox"/>	Blade Tightness	Page 13

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 cutter blades can cause excessive cutter vibration resulting in damage to the gearbox and structural damage to the cutter. You should replace or sharpen blades in pairs. Excessive vibration can cause rotating parts to break and fly off the cutter, 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 EVH Manufacturing Company.

Operation Instruction

Using Your Cutter

Getting Started

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

- ✓ Attach the cutter to the tractor, see the hook-up procedures on page 8 for complete instructions. After you have the cutter attached, double check to ensure that no part of the tractor is in contact with the cutter.
- ✓ Next, follow the instructions for installing the driveshaft on page 8 of this manual. Check to see that all PTO guards are in place correctly.
- ✓ 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 cutter 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 cutter!

- ✓ With all controls in neutral, the tractor in park, the throttle in idle position and the PTO off... Start the tractor engine.
- ✓ Carefully engage the tractor’s hydraulic system to detent position, leaving the tractor PTO off.
- ✓ Now with the cutter under power, practice using control valve levers to control the movement of the cutterhead, the boom arm, and the cutter head.

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

- ✓ Slowly increase the tractor throttle to a high idle speed and slowly engage the PTO.



Danger

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

- ✓ After the cutter is running smoothly, increase the tractor to 540 PTO RPM and adjust the cutterhead to the mowing position.
- ✓ Release the tractor from park and put the transmission in low range. You are now in mowing mode and are underway.



Caution

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

Side Dressing Trees

The design of your heavy-duty brush cutter will allow you to “side dress” trees if needed. Approximately 58” above ground level with the DB-4048, and 70” above ground level with the DB-4060. To do this tilt the cutterhead to the vertical position. With the blades “on” move forward slowly, removing only approximately 12 inch depth of material per pass.

Unhook and Post Use Care

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

Unhooking the DB-4048 & DB-4060

- ✓ To unhook from your unit, first lower the jack stand to the storage position.
- ✓ Lower the deck so that it rests firmly and evenly on the ground.
- ✓ Lower the tractor lift arms so that the mower will rest firmly on the jack stand.
- ✓ Be sure to relieve all hydraulic pressure on the extension arm and deck before unhooking.
- ✓ Unhook tractor hitch from 3-point frame on mower.

Post use care

- Never leave driveshaft hanging down and touching the ground.

Maintenance

Maintenance and Service Schedule

This section is dedicated to the maintenance of the DB-Series Machines. 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.

Extension Arms

Inject with heavy multi-purpose grease. There are 4 grease fittings on the arms.

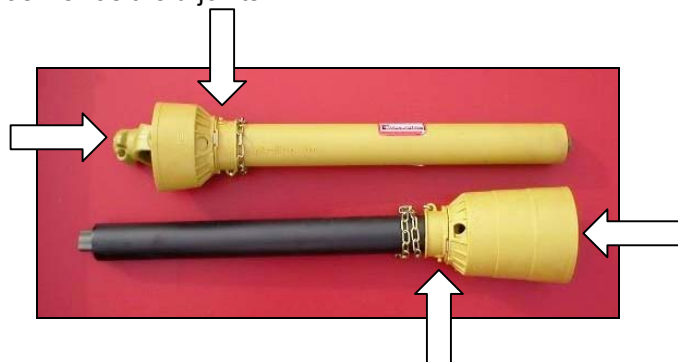
Hydraulic Motor Housing Assembly

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



Greasing PTO Driveshaft to Pump

Remove PTO shaft from cutter 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 cutting blades on the Hardee cutter 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 cutter 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 deck. Rotate cutter deck all the way up. 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 blade holder must be replaced.
- ✓ Blade and spindle bolts and nuts should be checked daily.

Maintenance

Replacement

- ✓ Remove cotter pin and castle nut from blade holder shaft.
- ✓ 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 7 for reference.

Checking the Cutter Head Relief Valve

The DB-4048 & DB-4060 are equipped with a cutter-head relief valve that comes pre-set from the factory. This valve is attached to the top of the pump (Item 37 on 22700 and 22721) 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 cutter-head relief is as follows:

- ✓ Start the tractor and with the tractor in park, place the cutter-head on the ground. Engage the tractor PTO to power the cutter-head and increase engine speed until 540 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 pump pressure line. Install a 3000 or 5000 psi pressure gauge into the 12-M-JIC outlet. The gauge should block off the pump outlet downstream of 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 2500 psi or less, you may proceed.)
- ✓ Increase tractor engine speed to 540 PTO RPM. Engage tractor PTO and immediately observe the pressure reading and disengage tractor PTO.

The correct pressure setting is 2500 psi. If the reading is less than 2000 or more the 2500, 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 2500-psi cutterhead pressure. Failure to comply with this specification will cause severe hydraulic heat, loss of power and damage to components.



DANGER

Exceeding 2500 psi will cause premature hose failure (rupture), and possible bodily injury or property damage.



WARNING

Hydraulic cylinder lines are under high pressure. Make sure that the deck rests firmly in the ground, all hydraulic pressure is relieved, and tractor engine is off before removing hydraulic lines.

Maintenance**Routine Maintenance Checklist**

Interval	Item	Check	Lube	Change	Comments
Daily Or 10 Hours	Pump Drive Shaft		•		
	Pivot Points		•		
	Grease Fittings		•		
	Blades	•			Change If Damaged (In Pairs)
	Blade Bolts (Blade To Disk)	•			Change With Damaged Blades (In Pairs)
	Blade Holder Nut	•			Change With Damaged Blades (In Pairs)
	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

Troubleshooting Guide

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

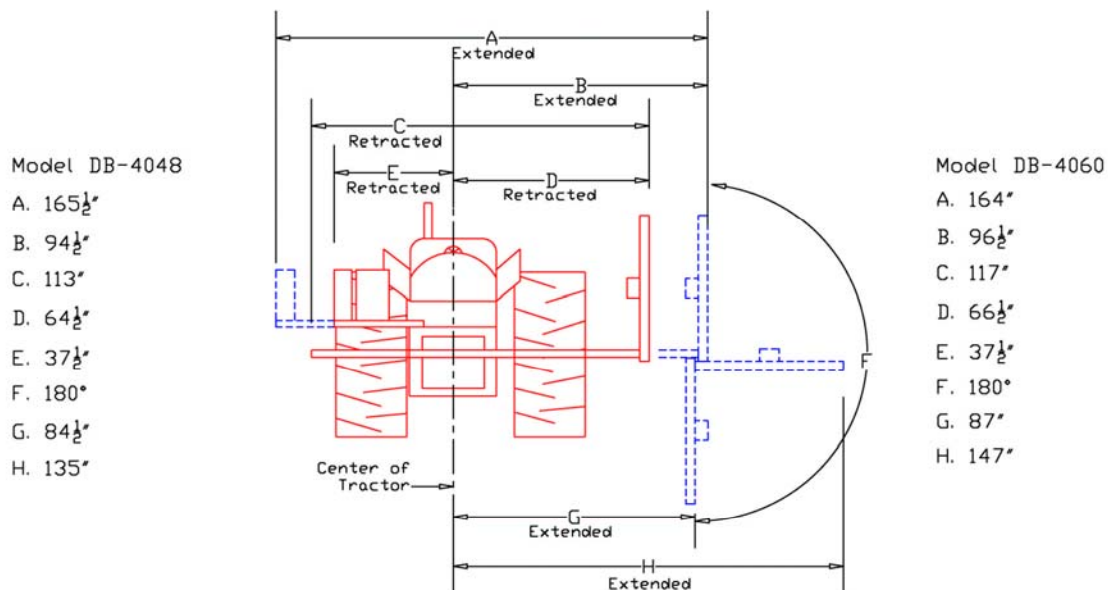
Problem	Possible Cause	Solution / Correction
Cylinder Will Not Operate	Oil Flow Restricted (Flow – Contained System)	Open Gate Valve on Bottom of Hydraulic Oil Tank
	Worn Pump (Self – Contained System)	Replace Pump
	Tractor Remotes not engaged	Engaged Remote
	Tractor Remote engaged In Reverse	Engage Remotes Opposite Way Or Switch Hydraulic Lines In Tractor Remotes.
Head Drifts Back When In Operation	Improper Relief Valve Setting	Adjust Relief Valves To Specifications (Refer To Pages 14)
	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 Cutting	Improper Relief Valve Setting	Check Relief Valve Setting (Refer To Page 14)
		Repair / Replace Relief Valve
Pump Whines	Worn Or Damaged Pump	Repair / Replace Pump
	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 14)
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 14)
Motor Seal Continually Blows Out Unit Vibrates Severely	Internal Popit Valve Damaged	Replace Popit Valves
	Broken Blade	Replace Blades, Blade Bolts And Nuts (Refer To Page 13)
	Blade Holder Loose	Repair / Replace Blade Holder (Refer To Page 13)
	Loose Output Shaft	Repair / Replace Shaft's Bearings In Cutter Head Housing
Cutter Head Grinds And Roars When Operating	Worn Bearings Or Improper Lubrication In Cutter 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
	Hydraulic Valve Cracked Internally	Repair / Replace Valve
	Improper Oil	Repair / Replace Oil (Use Hardee Oil Part No. 23333)
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 13)
	Bent Shaft	Replace PTO Shaft
Blades Won't Start-Up	Oil Flow Restricted	Open Gate Valve
		Repair / Replace Hydraulic Lines
		Replace In-Tank Filter

Specifications

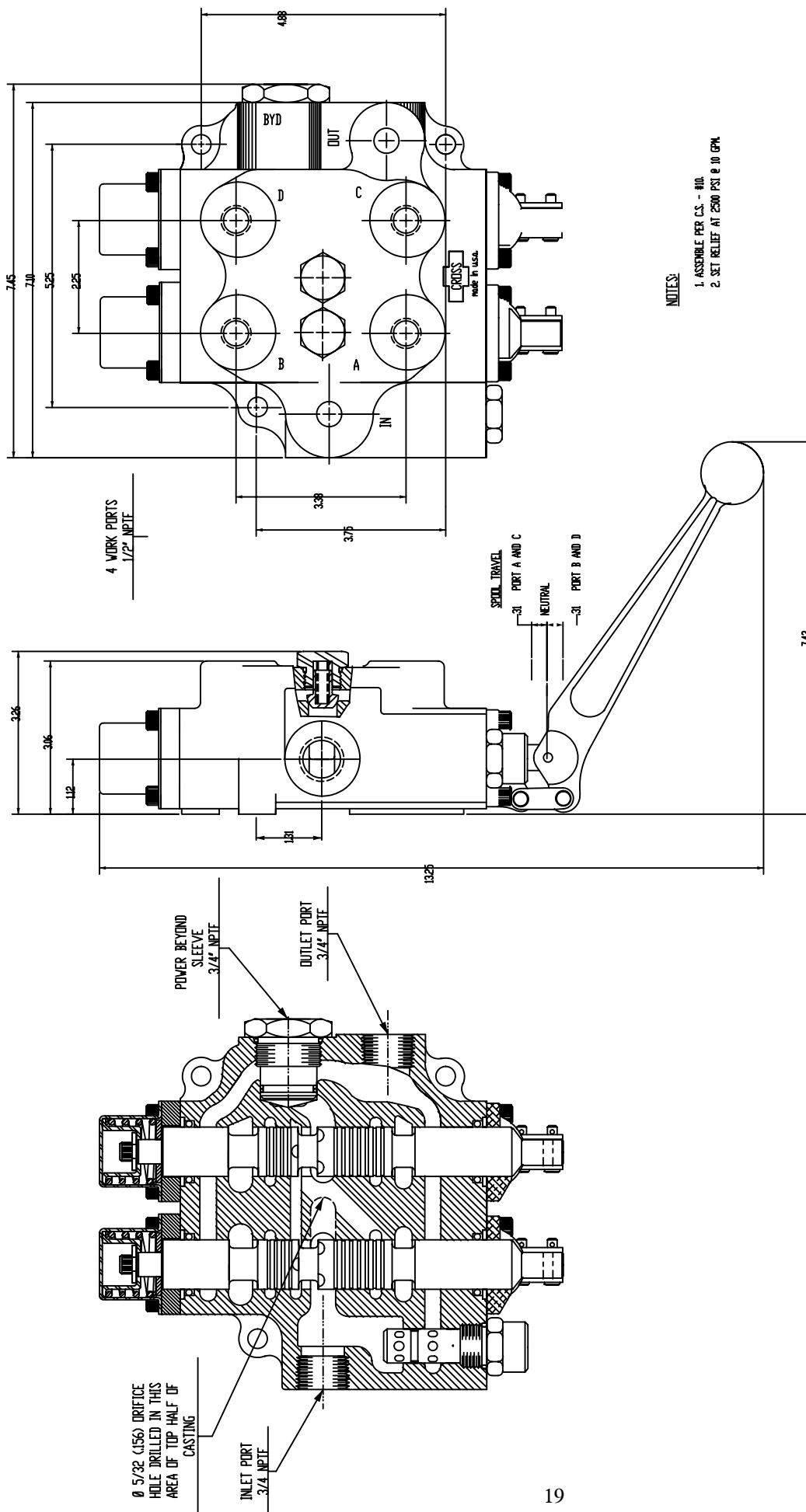


Specifications

Summary of Specifications

MODEL

DB4048		DB4060	
Approximate Weight (lbs.)	1,825 - Ready To Mow	Approximate Weight (lbs.)	2,100 - Ready To Mow
Blade Tip Speed (ft/min)	550 PTO – 9,450 ft/min 800 PTO – 13,700 ft/min	Blade Tip Speed (ft/min)	550 PTO – 11,900 ft/min 800 PTO – 17,300 ft/min
Blades	Round blade carrier	Blades	Round Blade Holder
Cutting Capacity / Suggested Usage	Trees up to 2" dia.	Cutting Capacity / Suggested Usage	Trees up to 2" dia.
Cutting Width	48"	Cutting Width	60"
Driveline	Category 2	Driveline	Category 2
Driveline Protection	Hydraulic Relief Valve	Driveline Protection	Hydraulic Relief Valve
Relief Valve Setting	2500 PSI	Relief Valve Setting	2500 PSI
Hitch	Standard Hitch, Category 2 Or 3 Quick Hitch	Hitch	Standard Hitch, Category 2 or 3 Quick Hitch
Motor	Hydraulic Vane Motor	Motor	Hydraulic Vane Motor
Reach (center of tractor to outside of cutter)	11'3" max.	Reach (center of tractor to outside of cutter)	12'3" max.
Width for trailering and road travel	9'5" min.	Width for trailering and road travel	9'9" min.
PTO Operating Speed	550 OR 800 RPM	PTO Operating Speed	550 OR 800 RPM
Pump	Hydraulic Spring Loaded Vane Pump	Pump	Hydraulic Spring Loaded Vane Pump
Round Blade Holder	Standard	Round Blade Holder	Standard
Rubber Shielding	Standard – Front & Rear	Rubber Shielding	Standard – Front & Rear
Front and Rear Chain Guard	Optional	Front and Rear Chain Guard	Optional
Tractor HP/ Weight Required	Min. 45 hp. / 4,400 lbs.	Tractor HP/ Weight Required	Min. 60 hp. / 4,800 lbs.
Hydraulic Oil System Capacity	35 Gallons	Hydraulic Oil System Capacity	35 Gallons
For best cutting results, run tractor PTO speed between 500-600 RPM		For best cutting results, run tractor PTO speed between 500-600 RPM	
Lateral cutting positions 90 degrees up or down		Lateral cutting positions 90 degrees up or down	
Shielded drive shaft		Shielded drive shaft	
Counter weight is hydraulically adjustable in, and out		Counter weight is hydraulically adjustable in, and out	



NOTES:

1. ASSEMBLE PER C.S. - #10.
2. SET RELIEF AT 2500 PSI @ 10 GPM.

HARDEE BY EVH. MFG. CO.
 MODELS DB-4048 & DB-4060
 DUAL SPOOL CONTROL VALVE

NAME
 NUMBER

EVH No. 10374

NOTES:

Item	Part Number	Qty.	Description	50	11860	10	TIE STRAP, (14" LG.) (100/PK)	99	22739	1	3/4" x 146" RETURN HOSE
1	10002	2	Hex Bolt, 1/4"-20 X 1" Gr.5 Plated	51	13214	2	SAFETY CHAIN CLEVIS WITH PIN	100	23019	1	Hitch Frame Weldment
2	10003	1	HEX BOLT (1/4" X 1-1/2" GR. 5 PLATED)	52	13532	4	CLAMP, SIZE 3/4" TO 1-3/4" X 9/16"	101	23038	1	Stand Weldment
3	10006	8	Hex Bolt 1/4" x 3" gr.5 plated	53	13535	6	STAINLESS STEEL CLAMP, 1-1/2" TO 1-3/4"	102	23048	2	Spc aer
4	10032	1	Hex Bolt 3/8 x 1-1/2 gr.5 plated	54	13557	1	3/4"-M-NPT X 3/4" Metal Hose Barb	103	23050	1	Cable Roller
5	10052	8	Hex Bolt 7/16 x 2 gr.5 plated	55	13563	1	1-1/4"-M-NPT X 1-1/2" Metal Hose Barb	104	23073	1	WELDMENT, CABLE BRACKET
6	10071	8	Hex Bolt 1/2 x 1 gr.5 plated	56	13632	1	1/4" NPT Metal Cap	105	23084	1	WELDMENT, Cable Bracket, DB
7	10092	4	Hex Bolt 5/8 x 2 gr.5 plated	57	13757	1	20-M-NPT X 16-F-NPT Reducer	106	23093	1	WELDMENT, Weight Box , DB
8	10093	2	Hex Bolt 5/8" x 2-1/2" gr.5 plated	58	13899	4	#6 JIC CAP	107	23101	1	Weldment, Oil Tank
9	10096	1	Hex Bolt 5/8"-11 x 4" gr.5 Plated	59	13906	4	ELBOW, 6-M-JIC X 8-M-NPT 90 DEG	108	23129	1	SHAFT, Counter Weight, DB
10	10153	9	Lock Nut, 1/4" Plated	60	13976	3	12-M-JIC X 12-M-NPT 90 Deg. Elbow	109	23130	1	Pivot Sleeve
11	10154	1	Lock Nut 5/16"-18 Plated	61	15015	2	PIN - CYLINDER LINK	110	23131	2	End Cap Weldment
12	10164	2	1/2" Hex Nut (Gr.5 Plated)	62	15241	1	Hydraulic Vane Motor	111	23136	2	Pressure Flange
13	10166	11	Lock Nut 5/8"-11 plated	63	15252	8	3/4" Hose Clamp Half	112	23137	2	Fluid Connector
14	10173	1	1" Castle Flange Nut	64	15255	4	Hose Clamp Cover Plate	113	23140	2	Tension Bolt
15	10175	1	3/8"-16 Locknut (Gr.5 Plated)	65	15268	2	FITTING, 3/4" HB X 12-F-JIC	114	23141	2	PIN, 1" X 5-3/8"
16	10176	6	1/2" Locknut (Gr.5 Plated)	66	15269	1	3/4" 140" HYDRAULIC PRESSURE HOSE	115	23142	1	PIN (1" DIA. C.R.S. X 6 7/8" LG.)
17	10181	1	Lockwasher 5/16" plated	67	15270	3	DECAL, MODEL DB4048	116	23146	1	SUCTION HOSE (1 1/2"" X 24")
18	10183	8	Lockwasher 7/16 plated	68	15845	1	Hydraulic Decal Kit	117	23147	2	CABLE, 1/4" X 82"
19	10184	8	Lockwasher 1/2 plated	69	15845-1	1	DANGER DECAL (KIT 15845)	118	23149	1	WELDMENT, Lift Chain
20	10185	6	Lockwasher 5/8" Plated	70	15845-10	1	WARNING DECAL (KIT 15845)	119	23154	1	CAP, weldment
21	10200	4	1/4" Plated Flatwasher	71	15845-11	3	WARNING DECAL (KIT 15845)	120	23157	1	RETURN HOSE, 3/4 X 42"
22	10202	2	3/8" Flatwasher (Plated)	72	15845-15	1	DANGER DECAL (KIT 15845)	121	23159	1	WELDMENT, LIFT ARM ASSEMBLY
23	10204	8	1/2 Flatwasher (Plated)	73	15845-16	3	DANGER DECAL (KIT 15845)	122	23202	1	WELDMENT, CABLE BRACKET
24	10207	8	Flatwasher, 1" plated	74	15845-2	1	DANGER DECAL (KIT 15845)	123	23345	1	Head Mounting Bracket Weldment
25	10247	1	Cotter Pin 3/16" X 1 1/4" Plated	75	15845-3	4	WARNING DECAL (KIT 15845)	124	23359	1	Head Mount Bracket Weldment
26	10252	8	Cotter Pin 3/16" X 2" Plated	76	15845-8	1	DANGER DECAL (KIT 15845)	125	23443	1	BLADE Holder W/Blades, W/Anti Wrap Hub
27	10307	2	Category I Hitch Pin	77	15845-9	1	WARNING DECAL (KIT 15845)	<div><div>Note:</div><div>Part #'s "13535 & 16682" have been listed with additional Qty to represent additional pump OPTION - (13535 Actual Qty: 4) (16682 Actual Qty: 1)</div></div>			
28	10322	1	1/4" Grease Fitting, 1/4"-28 Threaded	78	15852	2	Red Reflector Decal				
29	10335	1	Hardee Red Paint - (Not Shown)	79	15853	2	Yellow Reflector Decal				
30	10339	2	Pop Rivet	80	15854	1	Manual Holder				
31	10346	2	3 pt. Snap Pin (Lynch Pin)	81	15860	2	U-Nut, 1/4"-20				
32	10363	2	Bearing for Cable Roller	82	16012	1	Fitting, 12 F50X-S Straight Thread Connector				
33	10365	2	Clamp, 1/2" Plated Steel Loom	83	16100	1	Sight Gauge 5", With Thermometer				
34	10368	1	1-1/4" Gate Valve	84	16138	4	Lock Nut 7/16"-14 NC with Nylon Insert				
35	10373	1	Hydraulic Oil	85	16335	1	Hour Meter - not for resale				
36	10384	8	Wire Rope Clip,1/4" Forged	86	16577	1	Hydraulic Motor Housing Assembly				
37	10386	2	O-ring	87	16682	2	Relief Valve Assy. - 2700 PSI - Pump Mounted				
38	10387	2	O-ring	88	16683	1	Relief Valve 2700 PSI - w/TAMPER PROOF CAP				
39	10388	1	O-Ring	89	16684	1	Fitting, #12 HB/ M-ORB Straight				
40	10390	1	Clip Pin (1/8 x 2)	90	16685	8	Screw, 7/16-14 X 2-1/4 long - Zinc Plated				
41	10393	1	Universal Clip Pin	91	16686	8	Lock Washer, Zinc Plated 7/16 High Collar				
42	10501	1	FLOW EZY BREATHER	92	16697	1	ORB Hollow Hex Plug				
43	10646	2	Grease	93	16748	1	Cylinder, 3"X 18" With 1-1/4" Rod & 1" Pins				
44	11005	1	Decal, Warning - Thrown Objects	94	16749	1	CYLINDER, 3" X 30" TIE ROD , DBs				
45	11010	3	Large Hardee Logo Decal	95	20031	1	Access Cover				
46	11675	1	Return Filter Assembly	96	22701	1	DB4048 Deck Weldment				
47	11703	1	3/4" Street Elbow	97	22707	2	DB4048 Rubber Belting Kit				
48	11727	1	Serial Number Plate	98	22712	1	WELDMENT, Extension Arm, DB4060				
49	11850	1	Web Site Decal								

<

DWG. NO.		22700		REV.	
REV	CHANGE	BY	DATE	ECN	G
IR	INITIAL RELEASE	R.T.N.	8/16/04	---	
E	16682 Will Replace 10375 & 16435	T.B.B.	1/5/15	1578	
F	Manufacture Cylinder Change	T.B.B.	5/10/16	1655	
G	Pump 15240 Has Changed To Pump 16705	T.B.B.	12/14/16	1672	

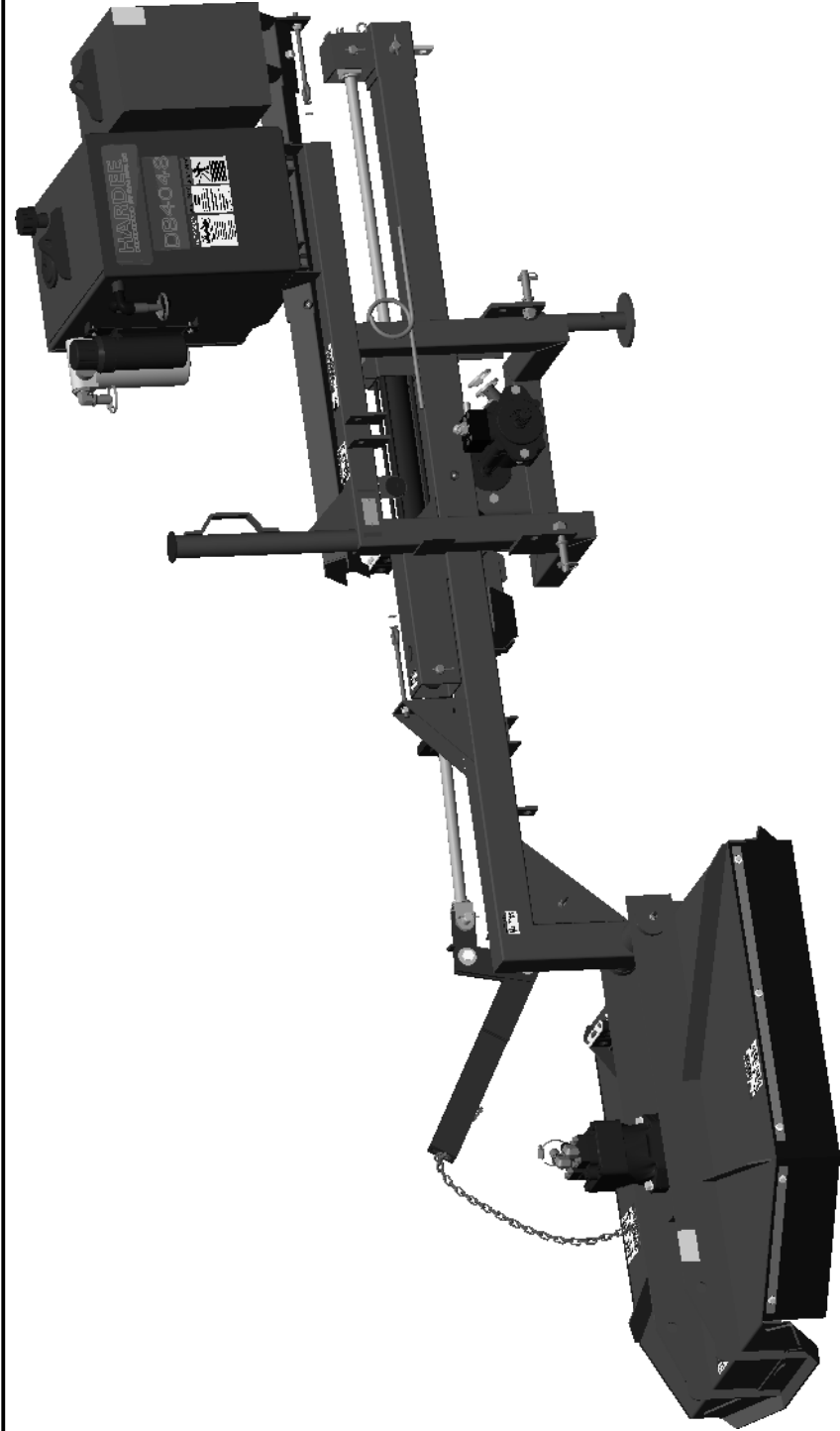
Note:
Part #'s "13535 & 16682" have been listed with additional Qty to represent additional pump OPTION - (13535 Actual Qty: 4) (16682 Actual Qty: 1)

Note:
This list of components is strictly to be viewed as a "BILL OF MATERIALS" of the "COMPLETE" mower. It is not related to any illustration.

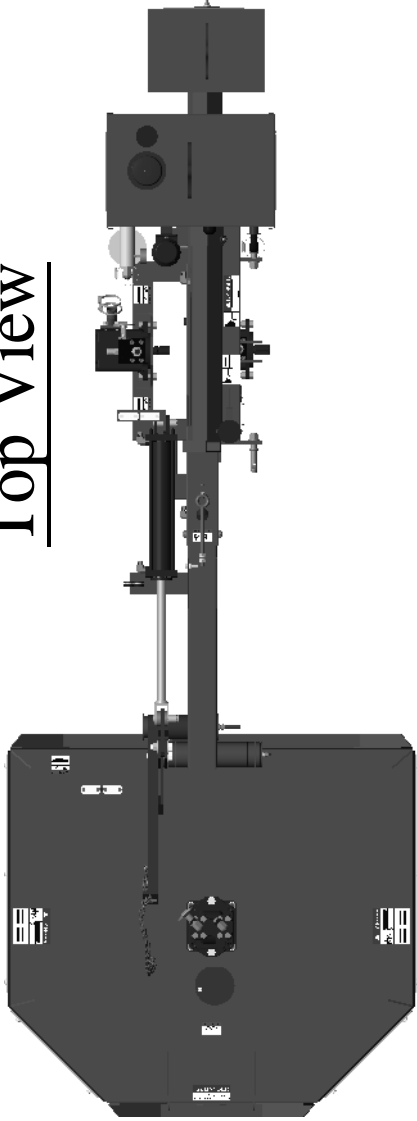
DB4048 Complete

All Dimensions in Inches Unless Otherwise Specified Dimensions in [] are in Millimeters	
Tolerance Unless Otherwise Specified	
Fractional Dimensions ± 1/16" Decimal Dim. to Limits Shown	Angular Dimensions ± 1° All Holes to be +0 - 1/32"

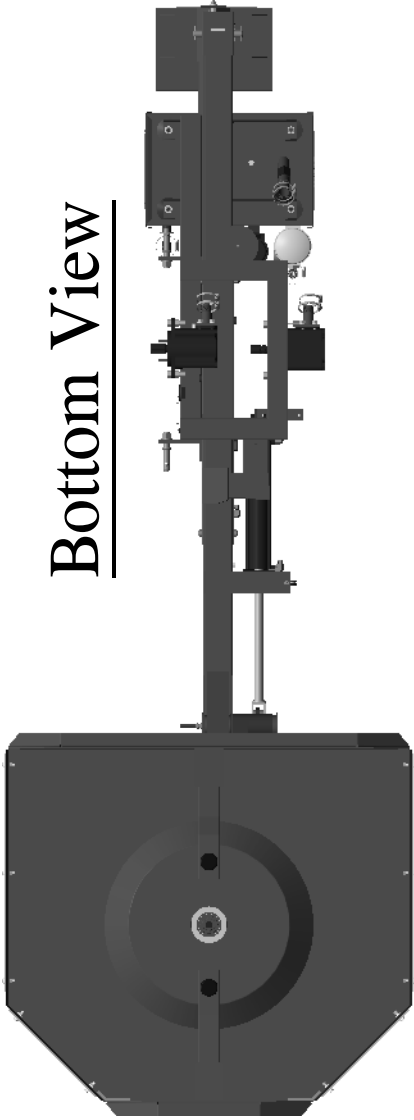
MODELED BY	T.B.B.	2/9/15	HARDEE BY		
DRAWN BY	R.T.N.	2/9/15	EVH MFG. CO.		
MATERIAL		R.M.N.	LORIS S.C.		
N/A			DESCRIPTION		
Manufactured By: EVH Mfg. Co., LLC		DB4048 Complete		DO NOT SCALE	B
				DWG. NO.	22700



Top View



Bottom View



DB4048 Complete

All Dimensions in Inches Unless Otherwise Specified
Dimensions in [] are in Millimeters

Tolerance Unless Otherwise Specified

Fractional Dimensions ± 1/16"
Angular Dimensions ± 1°
Decimal Dim. to Limits Shown
All Holes to be +0 -1/32"

DWG. NO.		REV.	
22700		G	
REV	CHANGE	BY	DATE
IR	INITIAL RELEASE	R.T.N.	8/16/04
E	16682 Will Replace 10375 & 16435	T.B.B.	1/5/15
F	Manufacture Cylinder Change	T.B.B.	5/10/16
G	Pump 15240 Has Changed To Pump 16705	T.B.B.	12/14/16

MODELED BY		T.B.B.	2/9/15	HARDEE BY	
DRAWN BY		R.T.N.	2/9/15	EVH MFG. CO.	
MATERIAL		R.M.N.		LORIS S.C.	
Manufactured By:		N/A		DESCRIPTION	
EVH Mfg. Co., LLC		DB4048 Complete		SHEET 2 of 7	
DO NOT SCALE		B		DWG. NO.	
				22700	

Hitch Frame & Components

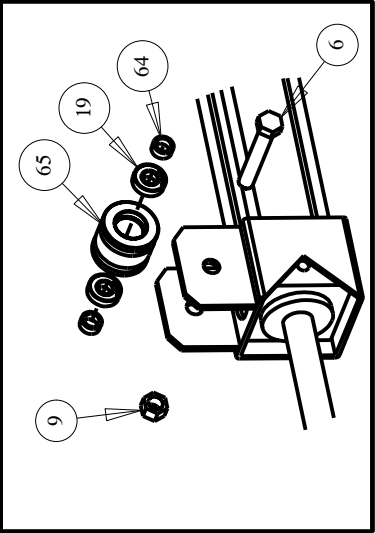
DWG. NO.		22700		REV.	
REV	CHANGE	BY	DATE	G	
IR	INITIAL RELEASE	R.T.N.	8/16/04	---	
E	16682 Will Replace 10375 & 16435	T.B.B.	1/5/15	1578	
F	Manufacture Cylinder Change	T.B.B.	5/10/16	1655	
G	Pump 15240 Has Changed To Pump 16705	T.B.B.	12/14/16	1672	

Item	Part Number	Qty.	Description		
1	10002	2	Hex Bolt, 1/4"-20 X 1" Gr.5 Plated	40	13976
2	10003	1	HEX BOLT (1/4" X 1-1/2" GR. 5 PLATED)	41	15015
3	10006	8	Hex Bolt 1/4" x 3" gr.5 plated	42	15241
4	10032	1	Hex Bolt 3/8 x 1-1/2 gr.5 plated	43	15252
5	10092	2	Hex Bolt 5/8 x 2 gr.5 plated	44	15255
6	10096	1	Hex Bolt 5/8"-11 x 4" gr.5 Plated	45	15268
7	10153	9	Lock Nut, 1/4" Plated	46	15270
8	10164	2	1/2" Hex Nut (Gr.5 Plated)	47	15845-11
9	10166	9	Lock Nut 5/8"-11 plated	48	15845-15
10	10175	1	3/8"-16 Locknut (Gr.5 Plated)	49	15845-16
11	10176	6	1/2" Locknut (Gr.5 Plated)	50	15845-2
12	10200	4	1/4" Plated Flatwasher	51	15845-3
13	10202	2	3/8" Flatwasher (Plated)	52	15845-8
14	10204	8	1/2 Flatwasher (Plated)	53	15845-9
15	10207	8	Flatwasher, 1" plated	54	15852
16	10252	8	Cotter Pin 3/16" X 2" Plated	55	15853
17	10307	2	Category I Hitch Pin	56	15854
18	10346	2	3 pt. Snap Pin (Lynch Pin)	57	15860
19	10363	2	Bearing for Cable Roller	58	16100
20	10365	2	Clamp, 1/2" Plated Steel Loom	59	16748
21	10368	1	1-1/4" Gate Valve	60	16749
22	10384	8	Wire Rope Clip,1/4" Forged	61	22712
23	10390	1	Clip Pin (1/8 x 2)	62	23019
24	10393	1	Universal Clip Pin	63	23038
25	10501	1	FLOW EZY BREATHER	64	23048
26	11005	1	Decal, Warning - Thrown Objects	65	23050
27	11010	3	Large Hardee Logo Decal	66	23073
28	11675	1	Return Filter Assembly	67	23084
29	11703	1	3/4" Street Elbow	68	23093
30	11850	1	Web Site Decal	69	23101
31	13214	2	SAFETY CHAIN CLEVIS WITH PIN	70	23129
32	13532	2	CLAMP, SIZE 3/4" TO 1-3/4" X 9/16"	71	23140
33	13535	4	STAINLESS STEEL CLAMP, 1-1/2" TO 1-3/4"	72	23141
34	13557	1	3/4"-M-NPT X 3/4" Metal Hose Barb	73	23142
35	13563	1	1-1/4"-M-NPT X 1-1/2" Metal Hose Barb	74	23147
36	13632	1	1/4" NPT Metal Cap	75	23149
37	13757	1	20-M-NPT X 16-F-NPT Reducer	76	23154
38	13899	4	#6 JIC CAP	77	23159
39	13906	4	ELBOW, 6-M-JIC X 8-M-NPT 90 DEG	78	23202

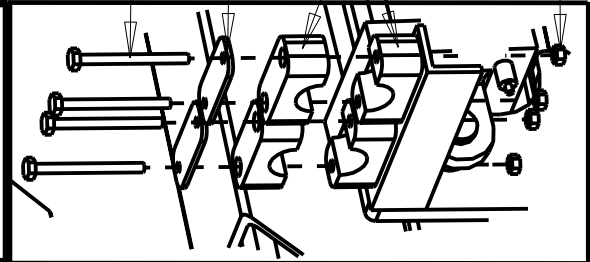
MODELED BY	T.B.B.	2/9/15	HARDEE BY EVH MFG. CO. LORIS S.C.	
DRAWN BY	R.T.N.	2/9/15		
MATERIAL	R.M.N.		DESCRIPTION	
	N/A		DB4048 Complete	
Manufactured By: EVH Mfg. Co., LLC		DO NOT SCALE	DWG. NO.	
			22700	

All Dimensions in Inches Unless Otherwise Specified Dimensions in [] are in Millimeters	
Tolerance Unless Otherwise Specified	
Fractional Dimensions ± 1/16"	Angular Dimensions ± 1°
Decimal Dim. to Limits Shown	
All Holes to be +0 -1/32"	

Detailed view A

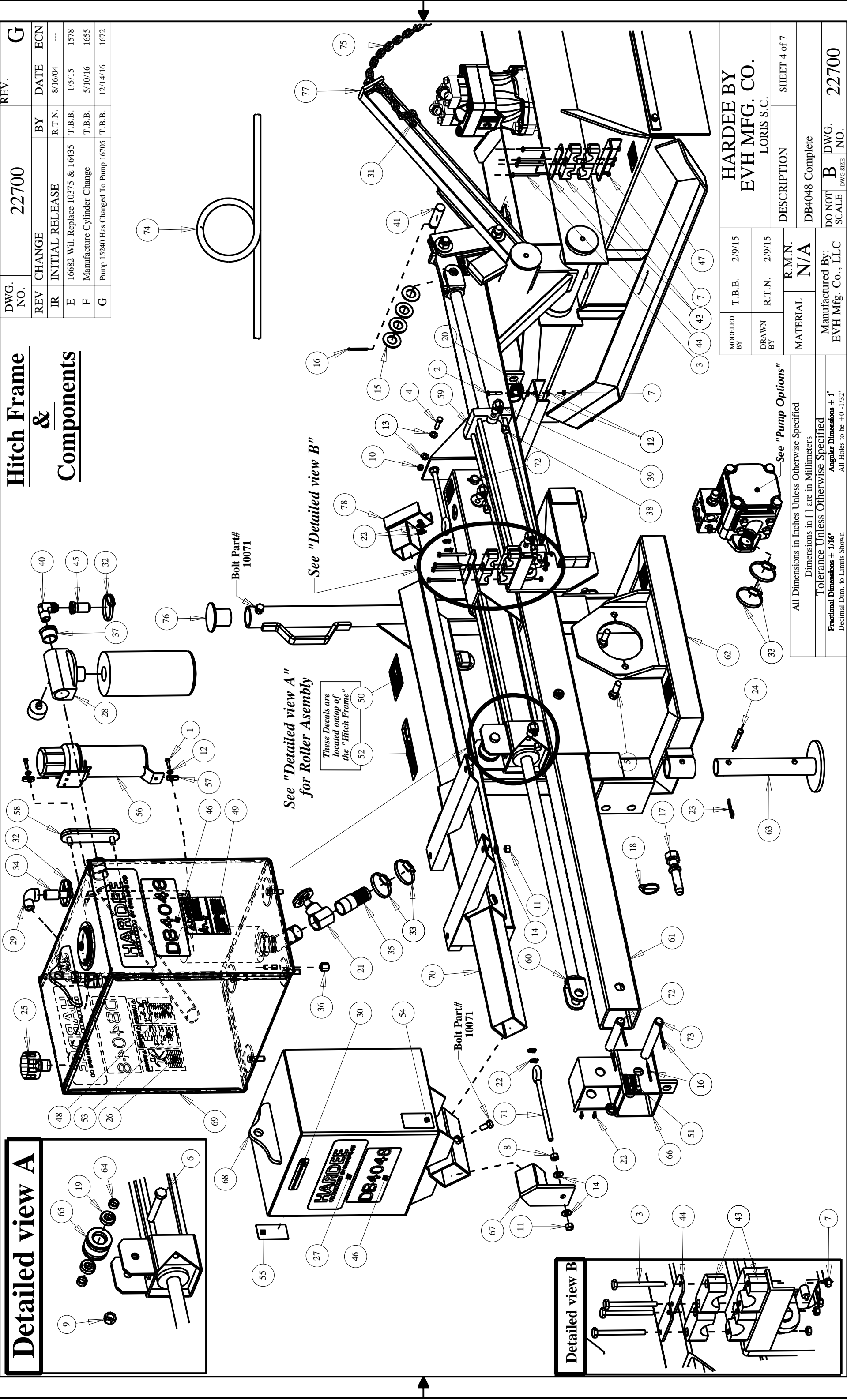


Detailed view B



Hitch Frame & Components

DWG. NO.		22700		REV.		G	
REV	CHANGE	BY	DATE	ECN			
IR	INITIAL RELEASE	R.T.N.	8/16/04	---			
E	16682 Will Replace 10375 & 16435	T.B.B.	1/5/15	1578			
F	Manufacture Cylinder Change	T.B.B.	5/10/16	1655			
G	Pump 15240 Has Changed To Pump 16705	T.B.B.	12/14/16	1672			



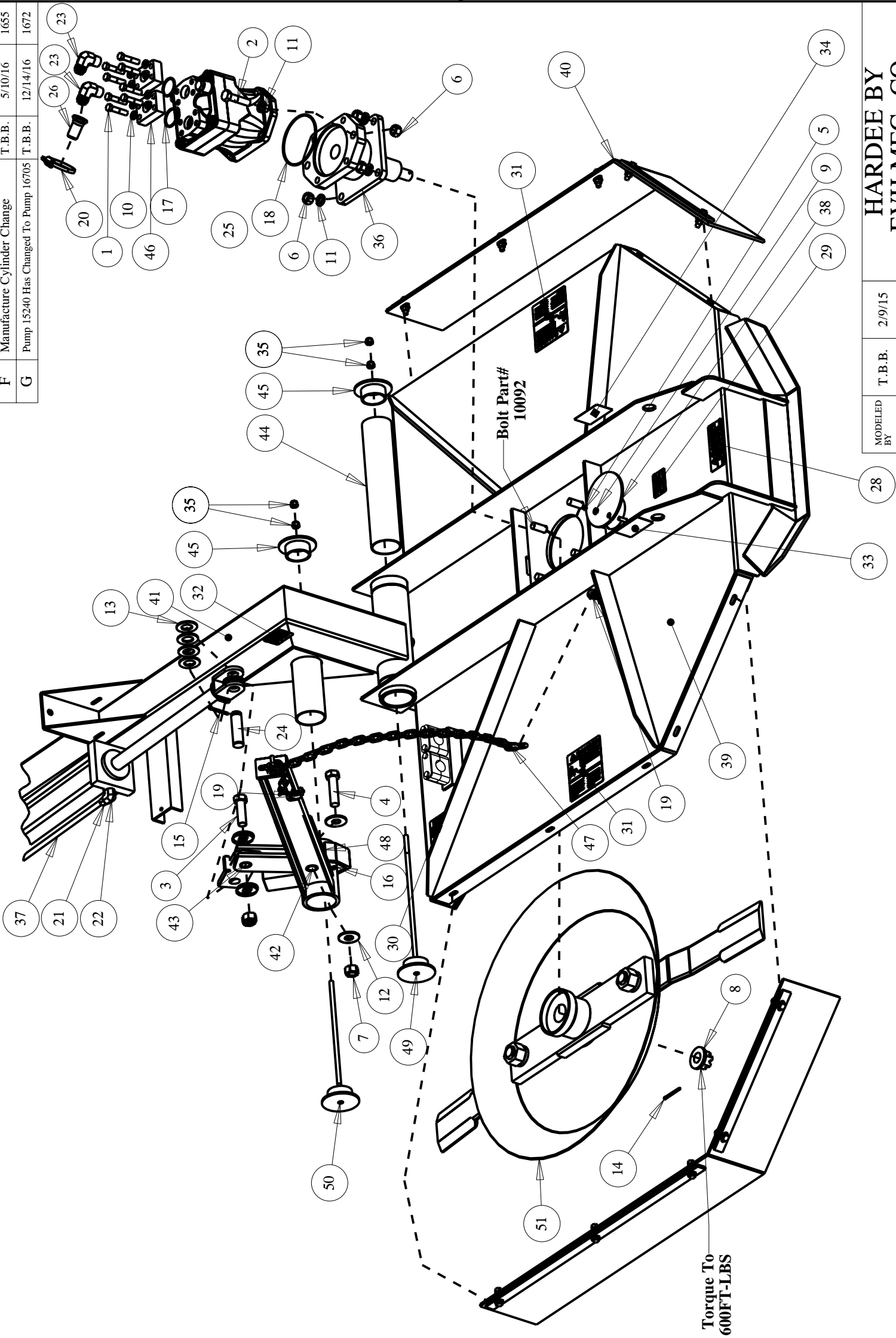
MODELED BY		T.B.B.	2/9/15	HARDEE BY	
DRAWN BY		R.T.N.	2/9/15	EVH MFG. CO.	
				LORIS S.C.	
MATERIAL		R.M.N.		DESCRIPTION	SHEET 4 of 7
		N/A		DB4048 Complete	
Manufactured By: EVH Mfg. Co., LLC				DO NOT SCALE	B DWG. DWG SIZE NO.
					22700

All Dimensions in Inches Unless Otherwise Specified
Dimensions in [] are in Millimeters
Tolerance Unless Otherwise Specified
Fractional Dimensions $\pm 1/16"$
Angular Dimensions $\pm 1^\circ$
Decimal Dim. to Limits Shown

Item	Part Number	Qty.	Description
1	10052	8	Hex Bolt 7/16 x 2 gr.5 plated
2	10093	2	Hex Bolt 5/8" x 2-1/2" gr.5 plated
3	10112	1	Hex Bolt 3/4" X 2-1/2" gr.5 Plated
4	10113	1	Hex Bolt 3/4" X 3" gr.5 Plated
5	10154	1	Lock Nut 5/16"-18 Plated
6	10166	6	Lock Nut 5/8"-11 plated
7	10168	2	3/4"-10 Locknut (Gr.5 Plated)
8	10173	1	1" Castle Flange Nut
9	10181	1	Lockwasher 5/16" plated
10	10183	8	Lockwasher 7/16 plated
11	10185	6	Lockwasher 5/8" Plated
12	10206	4	Flatwasher 3/4 plated
13	10207	8	Flatwasher, 1" plated
14	10247	1	Cotter Pin 3/16" X 1 1/4" Plated
15	10252	2	Cotter Pin 3/16" X 2" Plated
16	10322	1	1/4" Grease Fitting, 1/4"-28 Threaded
17	10386	2	O-ring
18	10388	1	O-Ring
19	13214	2	SAFETY CHAIN CLEVIS WITH PIN
20	13532	1	CLAMP, SIZE 3/4" TO 1-3/4" X 9/16"
21	13899	2	#6 JIC CAP
22	13906	2	ELBOW, 6-M-JIC X 8-M-NPT 90 DEG
23	13976	2	12-M-JIC X 12-M-NPT 90 Deg. Elbow
24	15015	2	PIN - CYLINDER LINK
25	15241	1	Hydraulic Vane Motor
26	15268	1	FITTING, 3/4" HB X 12-F-JIC
27	15845	1	Hydraulic Decal Kit
28	15845-1	1	DANGER DECAL (KIT 15845)
29	15845-10	1	WARNING DECAL (KIT 15845)
30	15845-11	1	WARNING DECAL (KIT 15845)
31	15845-16	2	DANGER DECAL (KIT 15845)
32	15845-3	2	WARNING DECAL (KIT 15845)
33	15852	1	Red Reflector Decal
34	15853	1	Yellow Reflector Decal
35	16138	4	Lock Nut 7/16"-14 NC with Nylon Insert
36	16577	1	Hydraulic Motor Housing Assembly
37	16748	1	Cylinder, 3"X 18" With 1-1/4" Rod & 1" Pins
38	20031	1	Access Cover
39	22701	1	DB4048 Deck Weldment
40	22707	2	DB4048 Rubber Belting Kit
41	22712	1	WELDMENT, Extension Arm, DB4060
42	23123	1	BUSHING FOR LIFT ARM (.824 I.D. X 1 1/2" LG.)
43	23124	1	BUSHING FOR LIFT ARM (.824 I.D. X 1 1/4" LG.)
44	23130	1	Pivot Sleeve
45	23131	2	End Cap Weldment
46	23136	2	Pressure Flange
47	23149	1	WELDMENT, Lift Chain
48	23159	1	WELDMENT, LIFT ARM ASSEMBLY
49	23345	1	Head Mounting Bracket Weldment
50	23359	1	Head Mount Bracket Weldment
51	23443	1	BLADE Holder W/Blades, W/Anti Wrap Hub

Belting, Motor & Blade Holder

DWG. NO.		22700		REV.		G
REV	CHANGE			BY	DATE	
IR	INITIAL RELEASE			R.T.N.	8/16/04	
E	16682 Will Replace 10375 & 16435			T.B.B.	1/5/15	
F	Manufacture Cylinder Change			T.B.B.	5/10/16	
G	Pump 15240 Has Changed To Pump 16705			T.B.B.	12/14/16	



MODELED BY		T.B.B.	2/9/15	HARDEE BY EVH MFG. CO. LORIS S.C.	
DRAWN BY		R.T.N.	2/9/15		
MATERIAL		R.M.N.		DESCRIPTION	SHEET 5 of 7
		N/A		DB4048 Complete	
Manufactured By: EVH Mfg. Co., LLC				DO NOT SCALE	DWG. NO.
					22700

All Dimensions in Inches Unless Otherwise Specified	
Dimensions in [] are in Millimeters	
Tolerance Unless Otherwise Specified	
Fractional Dimensions ± 1/16"	Angular Dimensions ± 1°
Decimal Dim. to Limits Shown	
All Holes to be +0 -1/32"	

NOTES:

Hydraulic Schematic

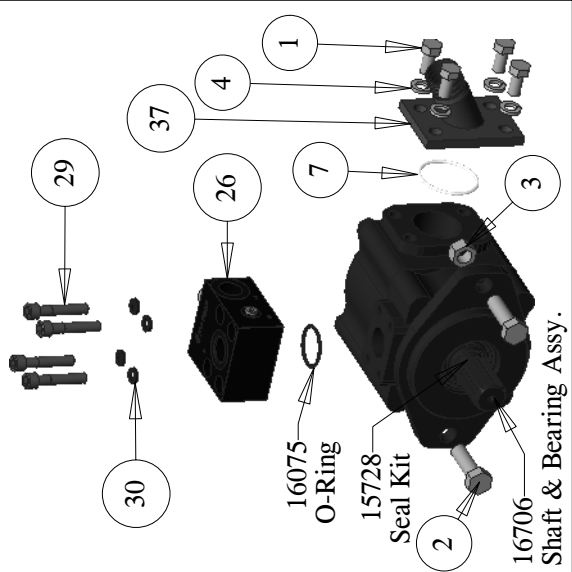
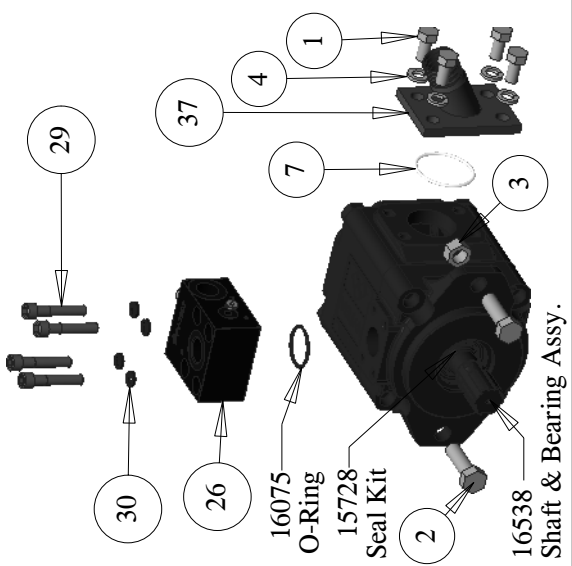
DWG. NO.		22700		REV.	
REV	CHANGE	BY	DATE	G	
IR	INITIAL RELEASE	R.T.N.	8/16/04	---	
E	16682 Will Replace 10375 & 16435	T.B.B.	1/5/15	1578	
F	Manufacture Cylinder Change	T.B.B.	5/10/16	1655	
G	Pump 15240 Has Changed To Pump 16705	T.B.B.	12/14/16	1672	

1	10071	8	Hex Bolt 1/2 x 1 gr.5 plated	26	16682	2	Relief Valve Assy. - 2700 PSI - Pump Mounted
2	10092	4	Hex Bolt 5/8 x 2 gr.5 plated	27	16683	1	Relief Valve 2700 PSI - w/TAMPER PROOF CAP
3	10166	4	Lock Nut 5/8"-11 plated	28	16684	1	Fitting, #12 HB/ M-ORB Straight
4	10184	8	Lockwasher 1/2 plated	29	16685	8	Screw, 7/16-14 X 2-1/4 long - Zinc Plated
5	10368	1	1-1/4" Gate Valve	30	16686	8	Lock Washer, Zinc Plated 7/16 High Collar
6	10373	1	Hydraulic Oil	31	16697	1	ORB Hollow Hex Plug
7	10387	2	O-ring	32	16705	1	Hydraulic 1000RPM Pump
8	10501	1	FLOW EZY BREATHER	33	16748	1	Cylinder, 3"X 18" With 1-1/4" Rod & 1" Pins
9	10646	2	Grease	34	16749	1	CYLINDER, 3" X 30" TIE ROD , DBs
10	11675	1	Return Filter Assembly	35	22739	1	3/4" x 146" RETURN HOSE
11	11703	1	3/4" Street Elbow	36	23101	1	Weldment, Oil Tank
12	11775	1	Hydraulic 540RPM Pump	37	23137	2	Fluid Connector
13	13532	3	CLAMP, SIZE 3/4" TO 1-3/4" X 9/16"	38	23146	1	SUCTION HOSE (1 1/2" X 24")
14	13535	6	STAINLESS STEEL CLAMP, 1-1/2" TO 1-3/4"	39	23157	1	RETURN HOSE, 3/4 X 42"

15	13557	1	3/4" -M-NPT X 3/4" Metal Hose Barb	<div>All Dimensions in Inches Unless Otherwise Specified Dimensions in [] are in Millimeters</div> <div>Tolerance Unless Otherwise Specified</div> <div>Fractional Dimensions ± 1/16" Decimal Dim. to Limits Shown</div> <div>Angular Dimensions ± 1° All Holes to be +0 -1/32"</div>	MODELED BY	T. B. B.	2/9/15	HARDEE BY EVH MFG. CO. LORIS S.C.	
16	13563	1	1-1/4" -M-NPT X 1-1/2" Metal Hose Barb		DRAWN BY	R. T. N.	2/9/15		
17	13632	1	1/4" NPT Metal Cap		MATERIAL	R.M.N. N/A			
18	13757	1	20-M-NPT X 16-F-NPT Reducer		Manufactured By: EVH Mfg. Co., LLC			DO NOT SCALE	DWG. NO.
19	13906	4	ELBOW, 6-M-JIC X 8-M-NPT 90 DEG					DB4048 Complete	22700
20	13976	1	12-M-JIC X 12-M-NPT 90 Deg. Elbow						
21	15241	1	Hydraulic Vane Motor						
22	15268	1	FITTING, 3/4" HB X 12-F-JIC						
23	15269	1	3/4" 140" HYDRAULIC PRESSURE HOSE						
24	15270	1	DECAL, MODEL DB4048						
25	16012	1	Fitting,12 F50X-S Straight Thread Connector						

Pump Options

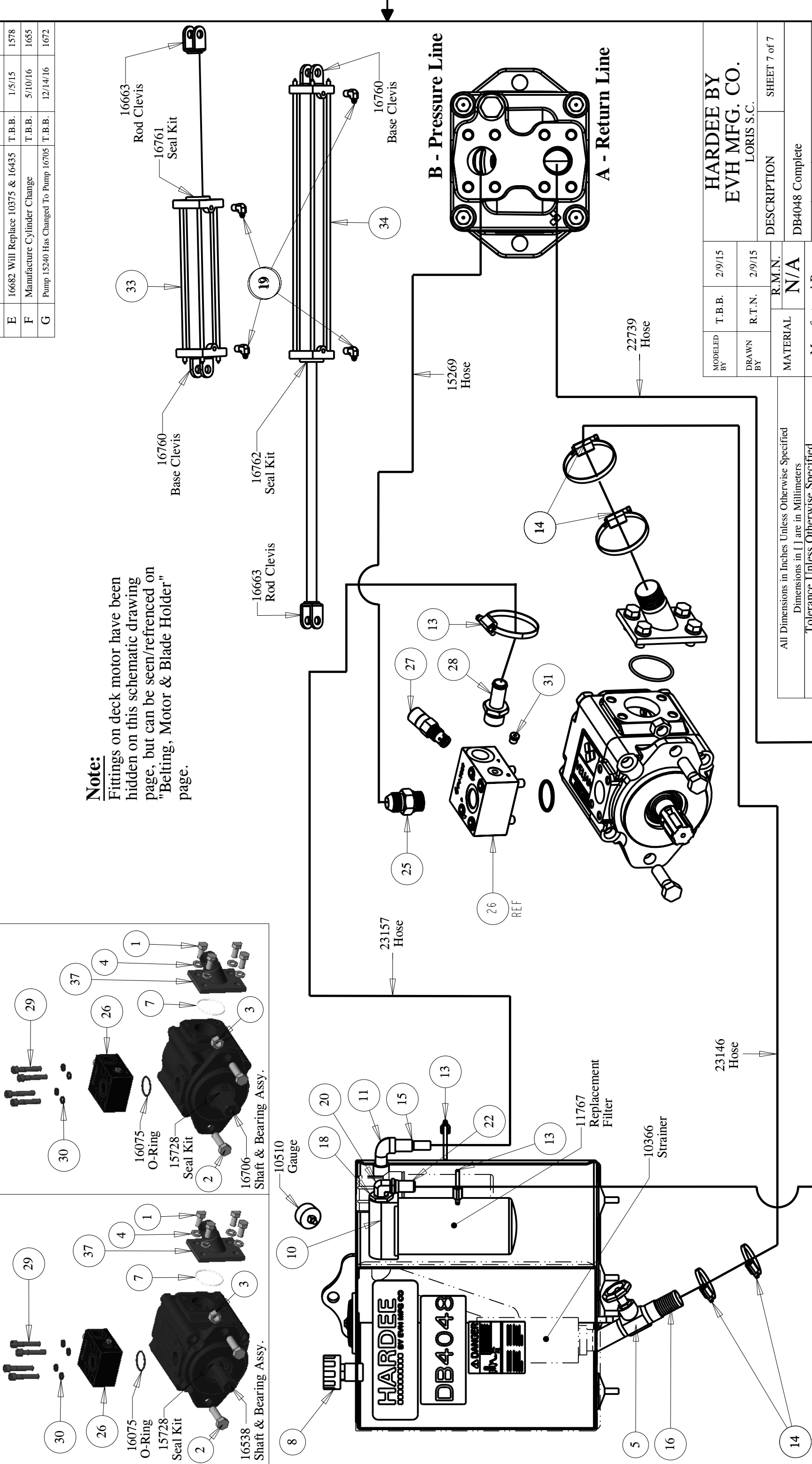
540 RPM - P/N: 11775 1000 RPM - P/N: 16705



Note:

Fittings on deck motor have been hidden on this schematic drawing page, but can be seen/referenced on "Belting, Motor & Blade Holder" page.

Hydraulic Schematic



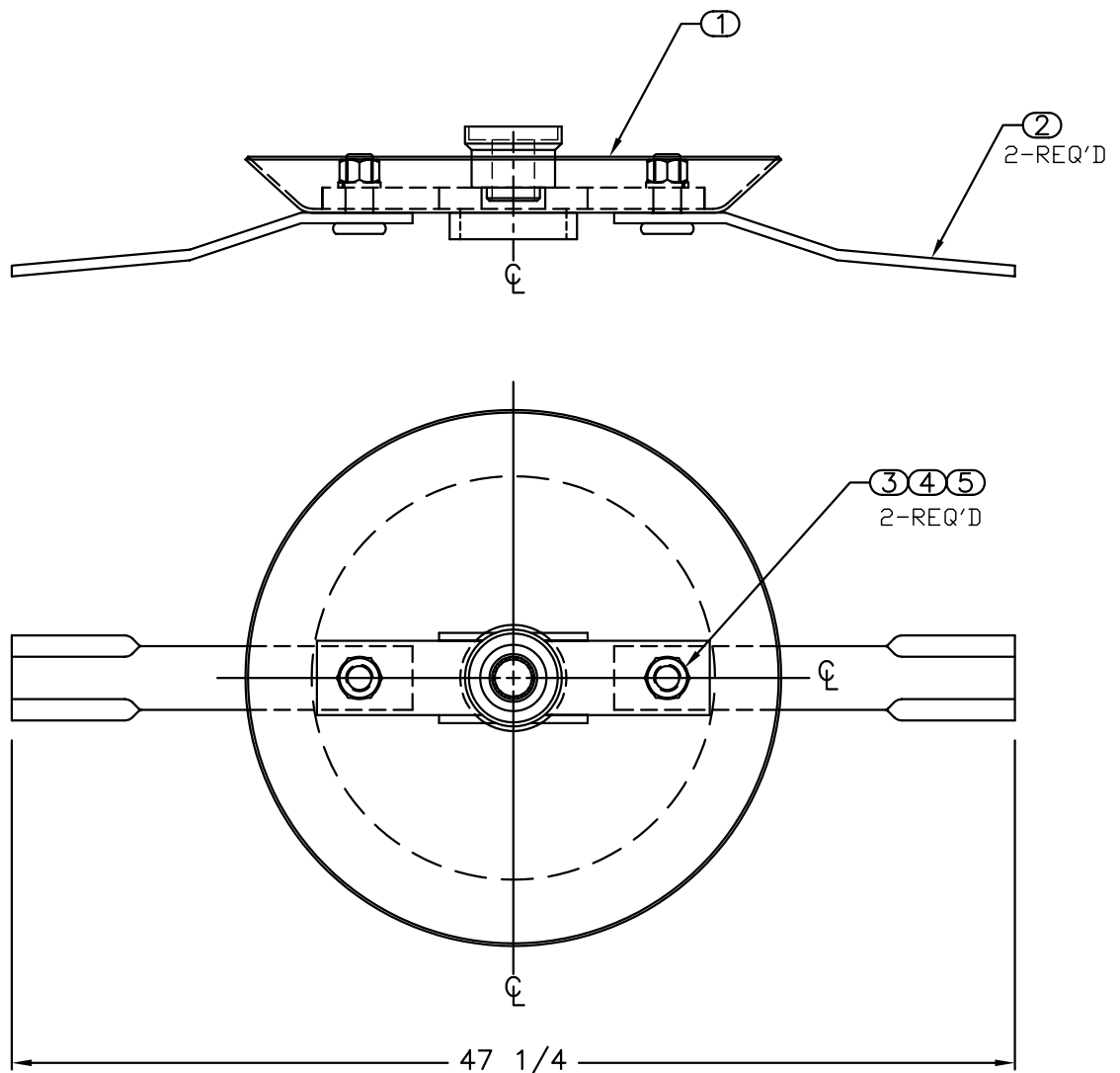
DWG. NO.		22700		REV.		G	
REV	CHANGE		BY	DATE	ECN		
IR	INITIAL RELEASE		R.T.N.	8/16/04	---		
E	16682 Will Replace 10375 & 16435		T.B.B.	1/5/15	1578		
F	Manufacture Cylinder Change		T.B.B.	5/10/16	1655		
G	Pump 15240 Has Changed To Pump 16705		T.B.B.	12/14/16	1672		

MODELED BY T.B.B.		2/9/15	HARDEE BY EVH MFG. CO. LORIS S.C.	
DRAWN BY R.T.N.		2/9/15	DESCRIPTION	SHEET 7 of 7
MATERIAL		R.M.N.	DB4048 Complete	
Manufactured By: EVH Mfg. Co., LLC		N/A		
		DO NOT SCALE	B DWG. NO. DWG SIZE	22700

All Dimensions in Inches Unless Otherwise Specified Dimensions in [] are in Millimeters	
Tolerance Unless Otherwise Specified	
Fractional Dimensions ± 1/16"	Angular Dimensions ± 1°
Decimal Dim. to Limits Shown	

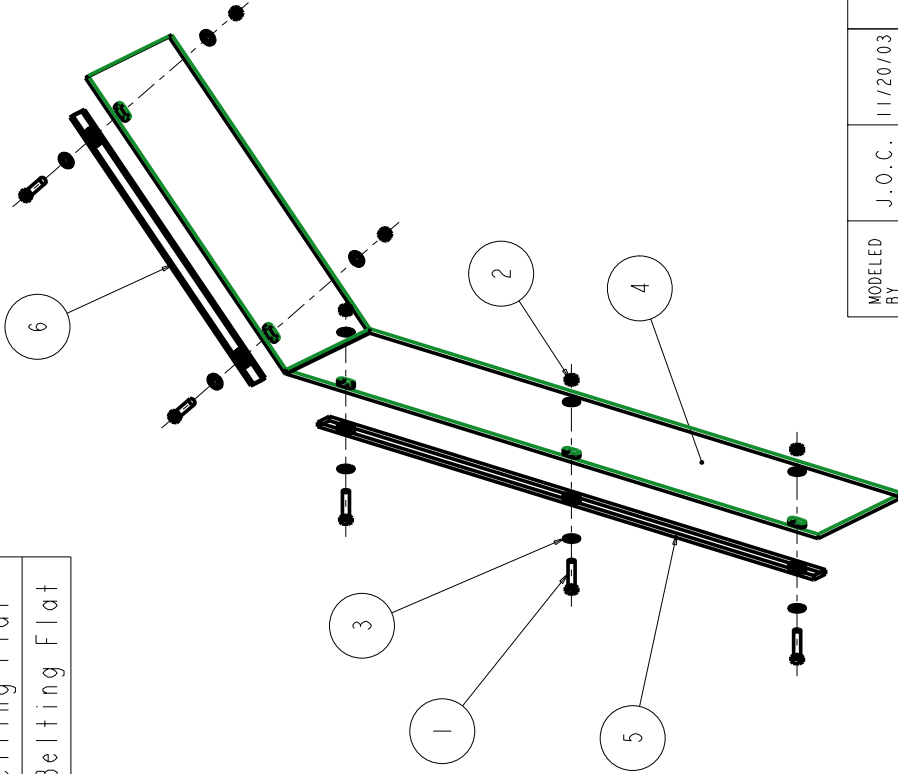
Part Number 23443 DB4048 Blade Holder

ITEM NO.	PART NUMBER	QTY REQD.	NOMENCLATURE OR DESCRIPTION
1	10311	2	BLADE BOLT NUT GR.8
2	10312	2	BLADE BOLT LOCKWASHER GR.8
3	10313	2	BLADE BOLT GR.8
4	10357	2	NON-DIRECTIONAL BLADE
5	26949	1	BLADE HOLDER WELDMENT



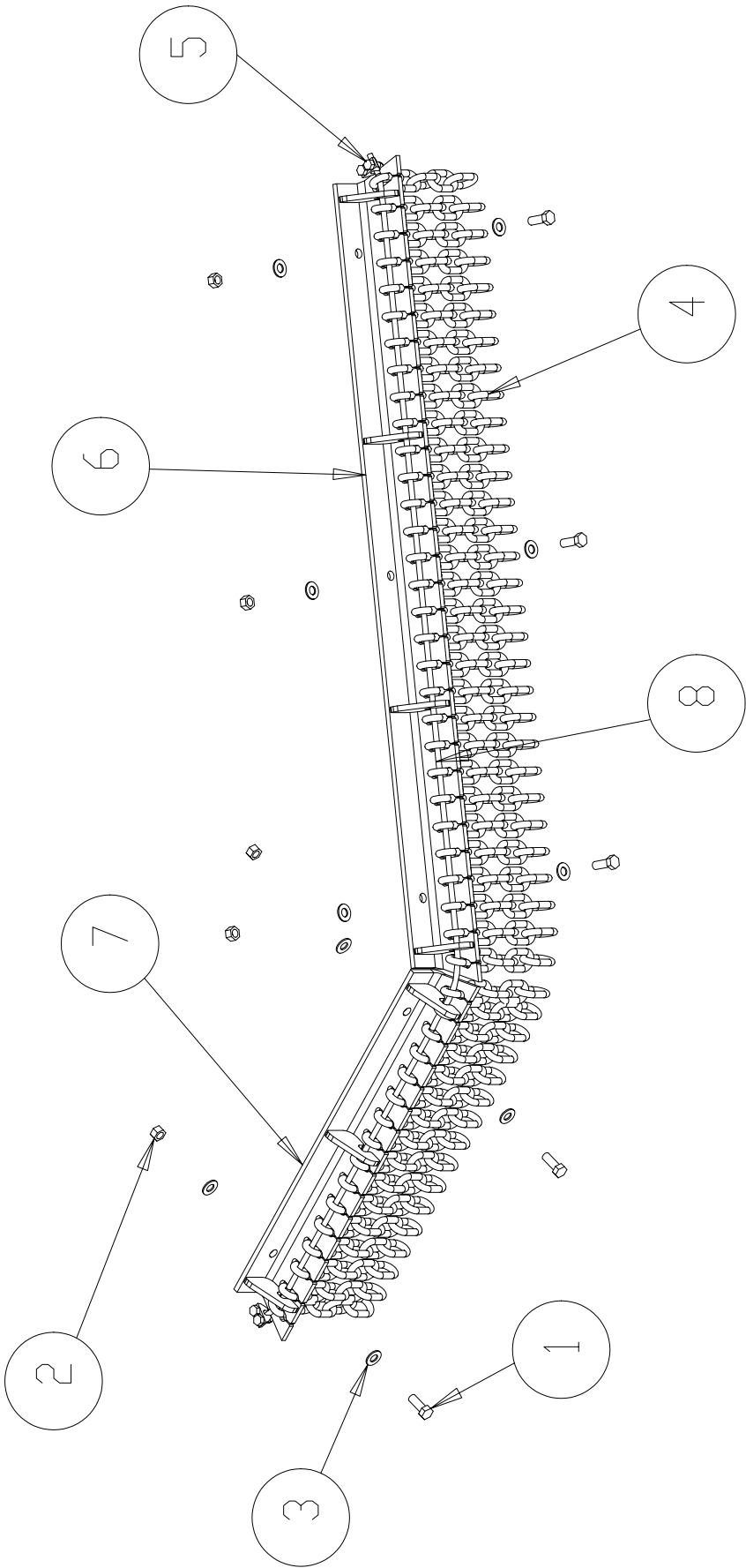
Item	Part Number	Qty.	Description
1	10032	5	Hex Bolt 3/8 x 1-1/2 gr.5 plated
2	10175	5	3/8" Locknut (Gr.5 Plated)
3	10202	10	3/8" Flatwasher (Plated)
4	22708	1	DB4048 Rubber Belting
5	22709	1	DB4048 Long Rubber Belting Flat
6	22710	1	DB4048 Short Rubber Belting Flat

DWG. NO.	22707	REV.	IR
REV	CHANGE	BY	DATE
IR	INITIAL RELEASE	J.O.C.	11/20/03
			- - -



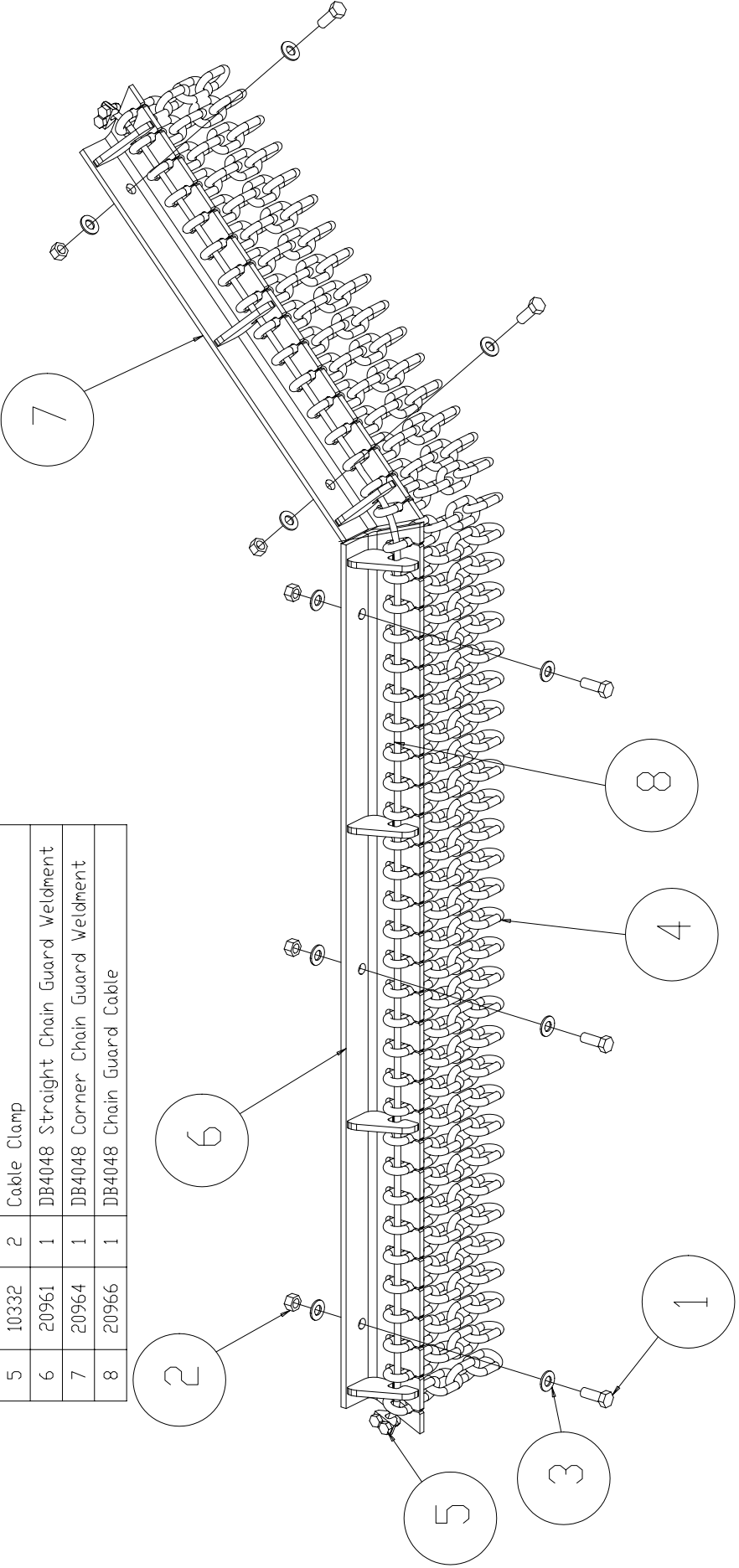
All Dimensions in Inches Unless Otherwise Specified
 Dimensions in [] are in Millimeters
 Tolerance Unless Otherwise Specified
 Fractional Dimensions $\pm 1/16"$
 Decimal Dim. to Limits Shown
 Angular Dimensions $\pm 1^\circ$
 All Holes to be $+0 -1/32"$

PARTS LISTING FOR DB4048 FRONT CHAIN GUARD (P/N 20960)		
Item	Part Number	Description
1	10031	5 Hex Bolt 3/8 x 1 gr.5 plated
2	10175	5 3/8" Locknut (Gr.5 Plated)
3	10202	10 3/8" Flatwasher (Plated)
4	10317	46 5 Link Chain
5	10332	2 Cable Clamp
6	20961	1 DB4048 Straight Chain Guard Weldment
7	20964	1 DB4048 Corner Chain Guard Weldment
8	20966	1 DB4048 Chain Guard Cable



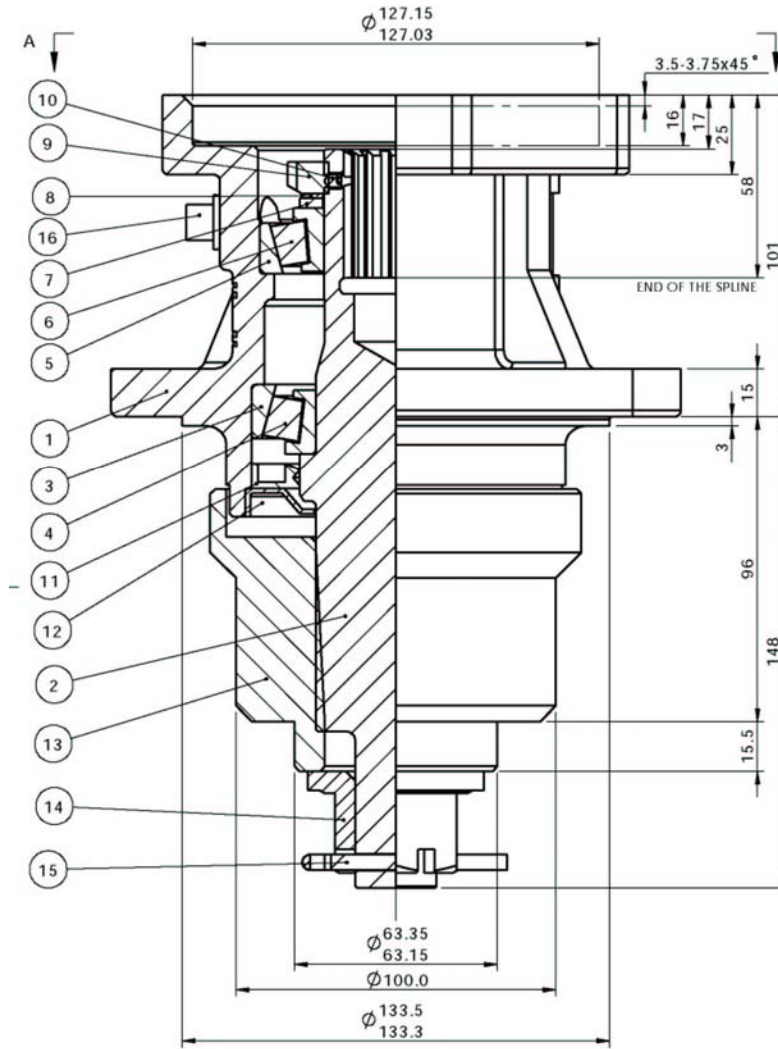
PARTS LISTING FOR DB4048 REAR CHAIN GUARD
(P/N 20967)

Item	Part Number	Qty.	Description
1	10031	5	Hex Bolt 3/8 x 1 gr.5 plated
2	10175	5	3/8" Locknut (Gr.5 Plated)
3	10202	10	3/8" Flatwasher (Plated)
4	10317	46	5 Link Chain
5	10332	2	Cable Clamp
6	20961	1	DB4048 Straight Chain Guard Weldment
7	20964	1	DB4048 Corner Chain Guard Weldment
8	20966	1	DB4048 Chain Guard Cable



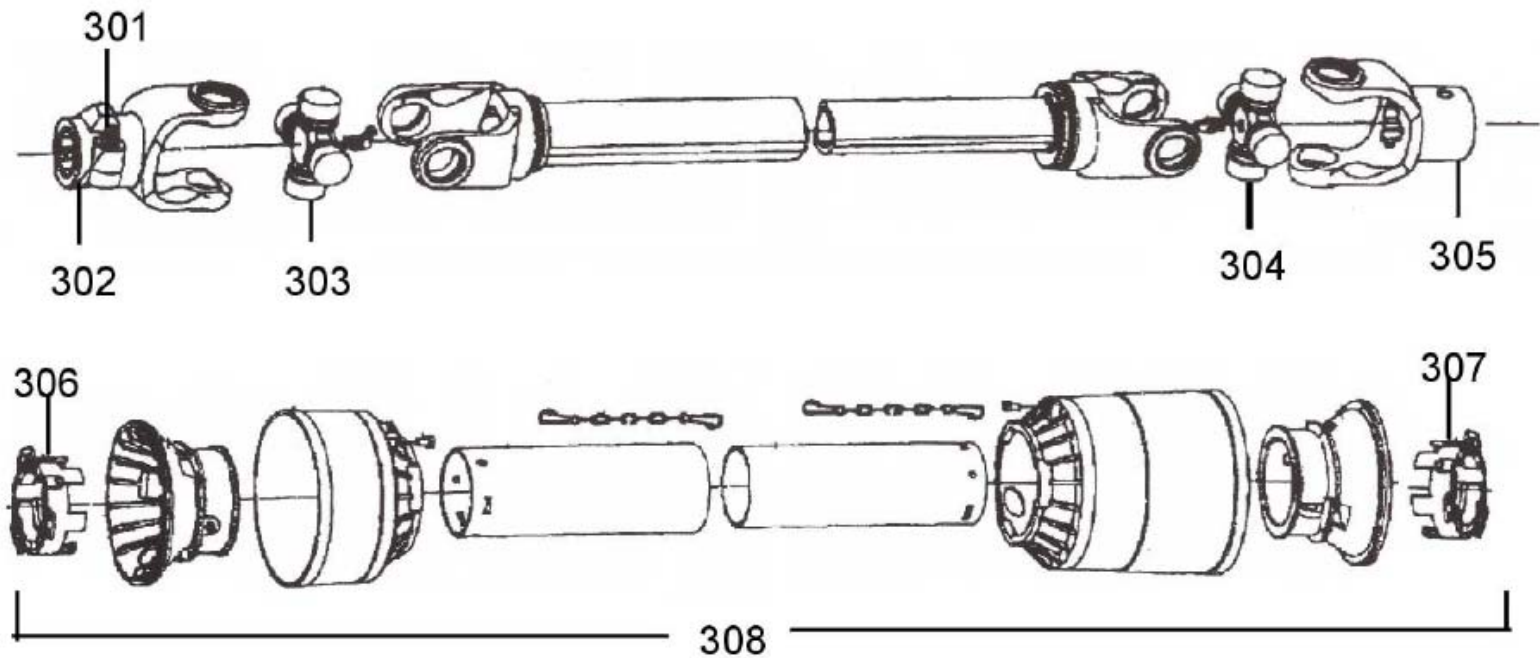
EVH P/N 16577

Hydraulic Motor Housing For DB-4048 AND DB-4060



<u>Key #</u>	<u>Part No.</u>	<u>Description</u>	<u>Key #</u>	<u>Part No.</u>	<u>Description</u>
1	N/A	Housing	9	16484	Locknut
2	N/A	Shaft	10	16480	Set Screw
3	15777	Cup	11	16479	Lip Seal-Output
4	15778	Bearing	12	16483	Seal Protector
5	15779	Cup	13	16472	Blade Hub
6	15780	Bearing	14	10173	Nut, Hex Slotted
7	15782	Washer w/tang	15	10243	Cotter Pin
8	15783	Lockwasher	16	15784	Plug, Pipe

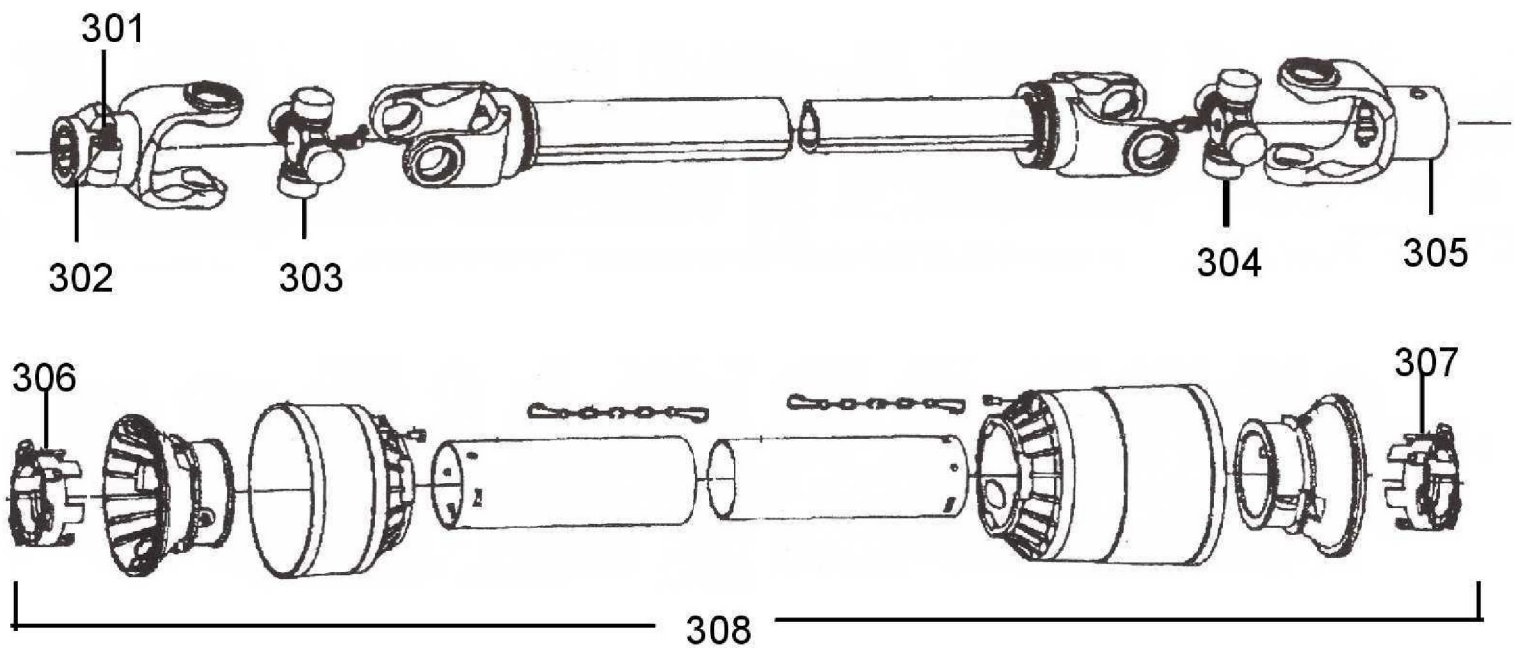
10601 Driveshaft



Key #	Part No.	Description	Key #	Part No.	Description
301	15579	Push Pin complete	305	16521	Yoke, Imp end
302	11436	Yoke, Tractor end	306	15804	Shield bearing
303	11437	Cross Kit	307	15805	Shield Bearing
304	11437	Cross Kit	308	11448	Shield kit complete

11716 Driveshaft

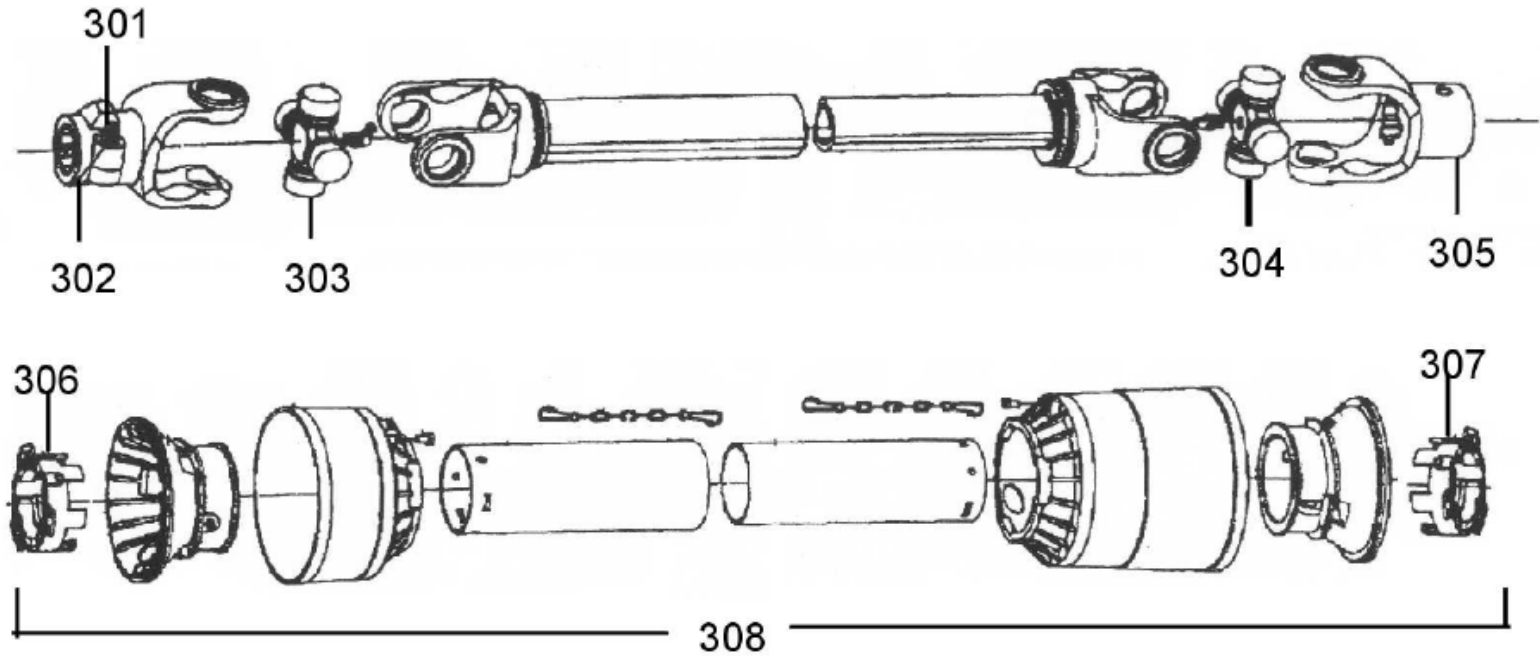
(1 3/4 20spline tractor end & 1 3/8 21spline Imp. end)



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 #	Description	Key #	Part #	Description
301	15579	Push Pin complete	305	16708	1 3/8 21 yoke w/ swell pin cat 4
302	15900	1 3/8 21 spline yoke tractor end		16765	Swell Pin Kit For 16708
303	11437	Cross Kit	306	15804	Shield bearing
304	11437	Cross Kit	307	15805	Shield Bearing
			308	11448	Shield kit complete

Item	Part Number	Qty.	Description	50	11860	10	TIE STRAP, (14" LG.) (100/PK)	99	23038	1	Stand Weldment
1	10002	2	Hex Bolt, 1/4"-20 X 1" Gr.5 Plated	51	13214	2	SAFETY CHAIN CLEVIS WITH PIN	100	23048	2	Spcaer
2	10003	1	HEX BOLT (1/4" X 1-1/2" GR. 5 PLATED)	52	13532	4	CLAMP, SIZE 3/4" TO 1-3/4" X 9/16"	101	23050	1	Cable Roller
3	10006	8	Hex Bolt 1/4" x 3" gr.5 plated	53	13535	6	STAINLESS STEEL CLAMP, 1-1/2" TO 1-3/4"	102	23084	1	WELDMENT, Cable Bracket, DB
4	10032	1	Hex Bolt 3/8 x 1-1/2 gr.5 plated	54	13557	1	3/4"-M-NPT X 3/4" Metal Hose Barb	103	23093	1	WELDMENT, Weight Box , DB
5	10052	8	Hex Bolt 7/16 x 2 gr.5 plated	55	13563	1	1-1/4"-M-NPT X 1-1/2" Metal Hose Barb	104	23101	1	Weldment, Oil Tank
6	10071	8	Hex Bolt 1/2 x 1 gr.5 plated	56	13632	1	1/4" NPT Metal Cap	105	23129	1	SHAFT, Counter Weight, DB
7	10092	4	Hex Bolt 5/8 x 2 gr.5 plated	57	13757	1	20-M-NPT X 16-F-NPT Reducer	106	23130	1	Pivot Sleeve
8	10093	2	Hex Bolt 5/8" x 2-1/2" gr.5 plated	58	13899	4	#6 JIC CAP	107	23131	2	End Cap Weldment
9	10096	1	Hex Bolt 5/8"-11 x 4" gr.5 Plated	59	13906	4	ELBOW, 6-M-JIC X 8-M-NPT 90 DEG	108	23136	2	Pressure Flange
10	10153	9	Lock Nut, 1/4" Plated	60	13976	3	12-M-JIC X 12-M-NPT 90 Deg. Elbow	109	23137	2	Fluid Connector
11	10154	1	Lock Nut 5/16"-18 Plated	61	15015	2	PIN - CYLINDER LINK	110	23140	2	Tension Bolt
12	10164	2	1/2" Hex Nut (Gr.5 Plated)	62	15242	1	Hydraulic Vane Motor	111	23141	2	PIN, 1" X 5-3/8"
13	10166	11	Lock Nut 5/8"-11 plated	63	15252	8	3/4" Hose Clamp Half	112	23142	1	PIN (1" DIA. C.R.S. X 6 7/8" LG.)
14	10173	1	1" Castle Flange Nut	64	15255	4	Hose Clamp Cover Plate	113	23146	1	SUCTION HOSE (1 1/2"" X 24")
15	10175	1	3/8"-16 Locknut (Gr.5 Plated)	65	15268	2	FITTING, 3/4" HB X 12-F-JIC	114	23147	2	CABLE, 1/4" X 82"
16	10176	6	1/2" Locknut (Gr.5 Plated)	66	15269	1	3/4" 140" HYDRAULIC PRESSURE HOSE	115	23149	1	WELDMENT, Lift Chain
17	10181	1	Lockwasher 5/16" plated	67	15271	3	DECAL, MODEL DB4060	116	23154	1	CAP, weldment
18	10183	8	Lockwasher 7/16 plated	68	15845	1	Hydraulic Decal Kit	117	23157	1	RETURN HOSE, 3/4 X 42"
19	10184	8	Lockwasher 1/2 plated	69	15845-1	1	DANGER DECAL (KIT 15845)	118	23159	1	WELDMENT, LIFT ARM ASSEMBLY
20	10185	6	Lockwasher 5/8" Plated	70	15845-10	1	WARNING DECAL (KIT 15845)	119	23176	1	Hitch Frame Weldment
21	10200	4	1/4" Plated Flatwasher	71	15845-11	3	WARNING DECAL (KIT 15845)	120	23200	1	WELDMENT, CABLE BRACKET
22	10202	2	3/8" Flatwasher (Plated)	72	15845-15	1	DANGER DECAL (KIT 15845)	121	23202	1	WELDMENT, CABLE BRACKET
23	10204	8	1/2 Flatwasher (Plated)	73	15845-16	3	DANGER DECAL (KIT 15845)	122	23345	1	Head Mounting Bracket Weldment
24	10207	8	Flatwasher, 1" plated	74	15845-2	1	DANGER DECAL (KIT 15845)	123	23359	1	Head Mount Bracket Weldment
25	10247	1	Cotter Pin 3/16" X 1 1/4" Plated	75	15845-3	4	WARNING DECAL (KIT 15845)	124	23448	1	BLADE Holder W/Blades, W/Anti Wrap Hub
26	10252	8	Cotter Pin 3/16" X 2" Plated	76	15845-8	1	DANGER DECAL (KIT 15845)				
27	10322	1	1/4" Grease Fitting, 1/4"-28 Threaded	77	15845-9	1	WARNING DECAL (KIT 15845)				
28	10335	1	Hardee Red Paint - (Not Shown)	78	15852	2	Red Reflector Decal				
29	10339	2	Pop Rivet	79	15853	2	Yellow Reflector Decal				
30	10346	2	3 pt. Snap Pin (Lynch Pin)	80	15854	1	Manual Holder				
31	10363	2	Bearing for Cable Roller	81	15860	2	U-Nut, 1/4"-20				
32	10365	2	Clamp, 1/2" Plated Steel Loom	82	16012	1	Fitting, 12 F50X-S Straight Thread Connector				
33	10368	1	1-1/4" Gate Valve	83	16100	1	Sight Gauge 5", With Thermometer				
34	10373	1	Hydraulic Oil	84	16138	4	Lock Nut 7/16"-14 NC with Nylon Insert				
35	10384	8	Wire Rope Clip,1/4" Forged	85	16335	1	Hour Meter - not for resale				
36	10386	2	O-ring	86	16577	1	Hydraulic Motor Housing Assembly				
37	10387	2	O-ring	87	16682	2	Relief Valve Assy. - 2700 PSI - Pump Mounted				
38	10388	1	O-Ring	88	16684	1	Fitting, #12 HB/ M-ORB Straight				
39	10390	1	Clip Pin (1/8 x 2)	89	16685	8	Screw, 7/16-14 X 2-1/4 long - Zinc Plated				
40	10393	1	Universal Clip Pin	90	16686	8	Lock Washer, Zinc Plated 7/16 High Collar				
41	10466	2	Cat. 2 Lower Hitch Pin	91	16697	1	ORB Hollow Hex Plug				
42	10501	1	FLOW EZY BREATHER	92	16748	1	Cylinder, 3"X 18" With 1-1/4" Rod & 1" Pins				
43	10646	2	Grease	93	16749	1	CYLINDER, 3" X 30" TIE ROD , DBs				
44	11005	1	Decal, Warning - Thrown Objects	94	20031	1	Access Cover				
45	11010	3	Large Hardee Logo Decal	95	22722	1	DB4060 Deck Weldment				
46	11675	1	Return Filter Assembly	96	22728	2	DB4060/LR50160 Rubber Belting Kit				
47	11703	1	3/4" Street Elbow	97	22733	1	WELDMENT, Extension Arm, DB4060				
48	11727	1	Serial Number Plate	98	22739	1	3/4" x 146" RETURN HOSE				
49	11850	1	Web Site Decal								

Note:

Part #'s "13535 & 16682" have been listed with additional Qty to represent additional pump OPTION - (13535 Actual Qty: 4) (16682 Actual Qty: 1)

DB4060 Complete

All Dimensions in Inches Unless Otherwise Specified
Dimensions in [] are in Millimeters

Tolerance Unless Otherwise Specified

Fractional Dimensions ± 1/16"
Decimal Dim. to Limits Shown

Angular Dimensions ± 1°
All Holes to be +0 -1/32"

DWG. NO.		22720		REV.		G
REV	CHANGE	BY	DATE	ECN		
IR	INITIAL RELEASE	R. T.N.	8/16/04	---		
E	16682 Will Replace 10375 & 16435	T. B.B.	1/5/15	1578		
F	Manufacture Cylinder Change	T. B.B.	5/10/16	1655		
G	Pump 15240 Has Changed To Pump 16705	T. B.B.	12/14/16	1672		

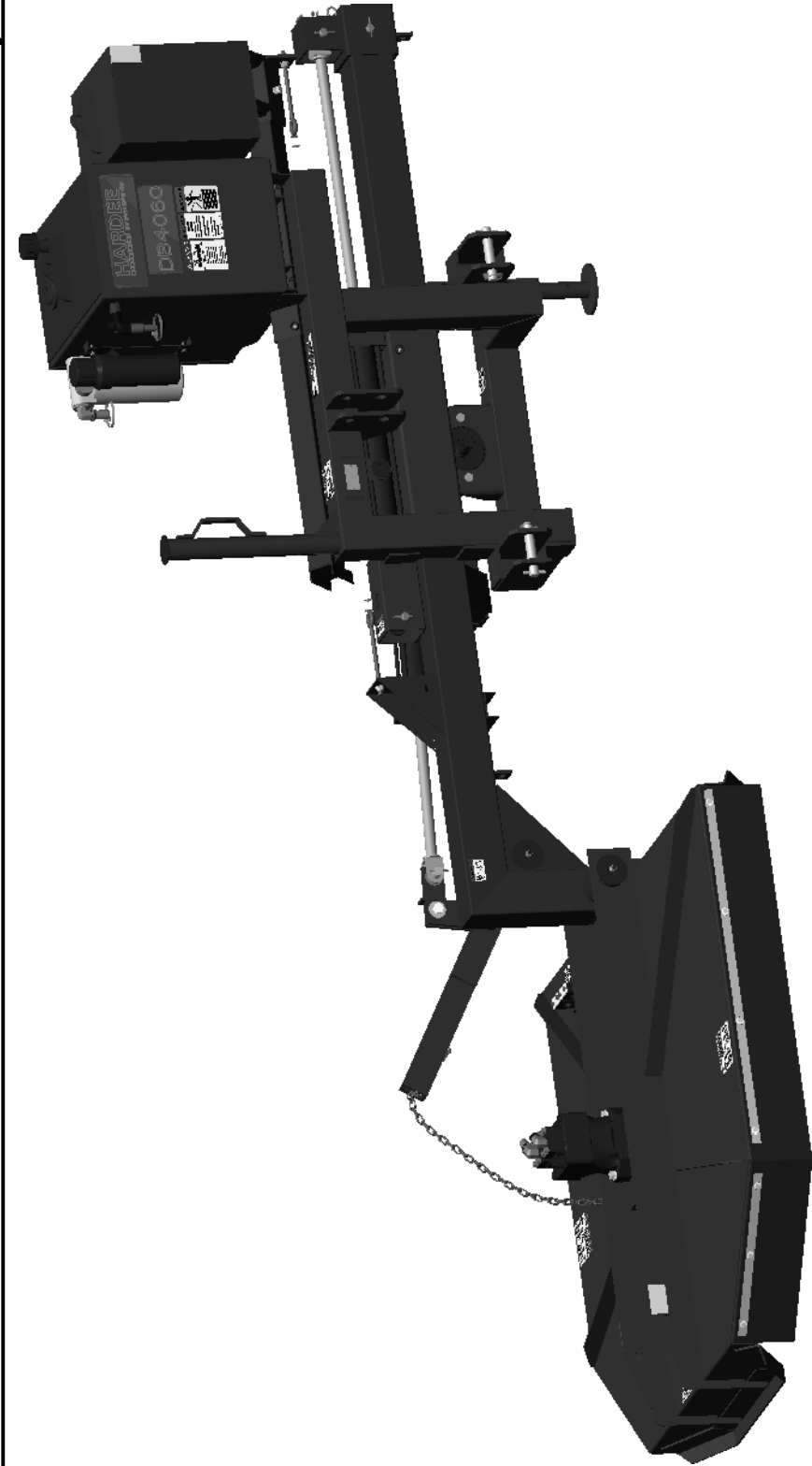
Note:
Part #'s "13535 & 16682" have been listed with additional Qty to represent additional pump OPTION - (13535 Actual Qty: 4) (16682 Actual Qty: 1)

Note:
This list of components is strictly to be viewed as a "BILL OF MATERIALS" of the "COMPLETE" mower. It is not related to any illustration.

DB4060 Complete

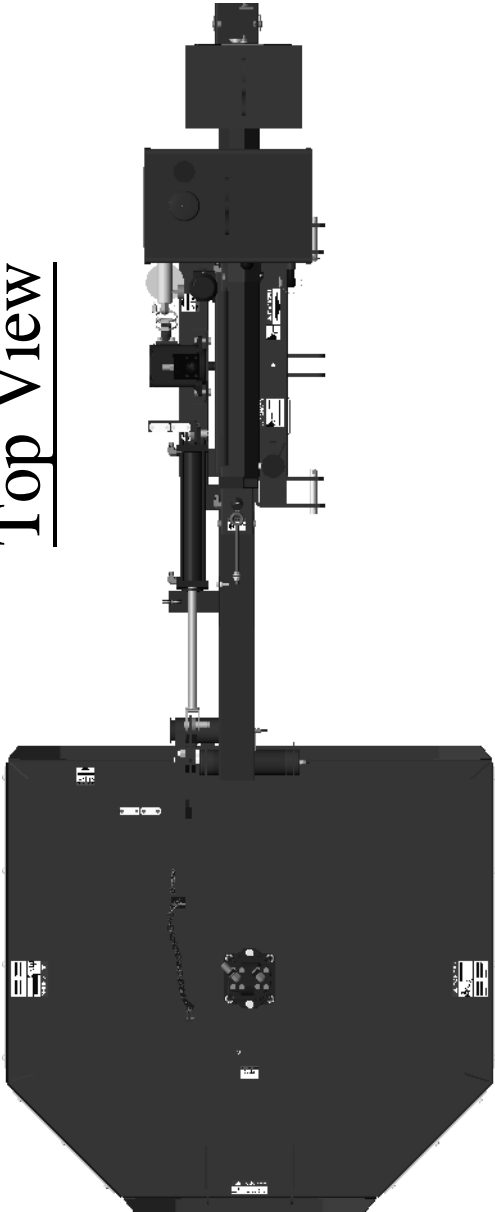
All Dimensions in Inches Unless Otherwise Specified Dimensions in [] are in Millimeters	
Tolerance Unless Otherwise Specified	
Fractional Dimensions ± 1" Decimal Dim. to Limits Shown	Angular Dimensions ± 1° All Holes to be +0 -1/32"

MODELED BY		T.B.B.	1/5/15	HARDEE BY		
DRAWN BY		R.T.N.	1/5/15	EVH MFG. CO.		
MATERIAL		R.M.N.		DESCRIPTION		SHEET 1 of 7
		N/A		DB4060 Complete		
Manufactured By: EVH Mfg. Co., LLC				DO NOT SCALE	B	DWG. NO.
				22720		

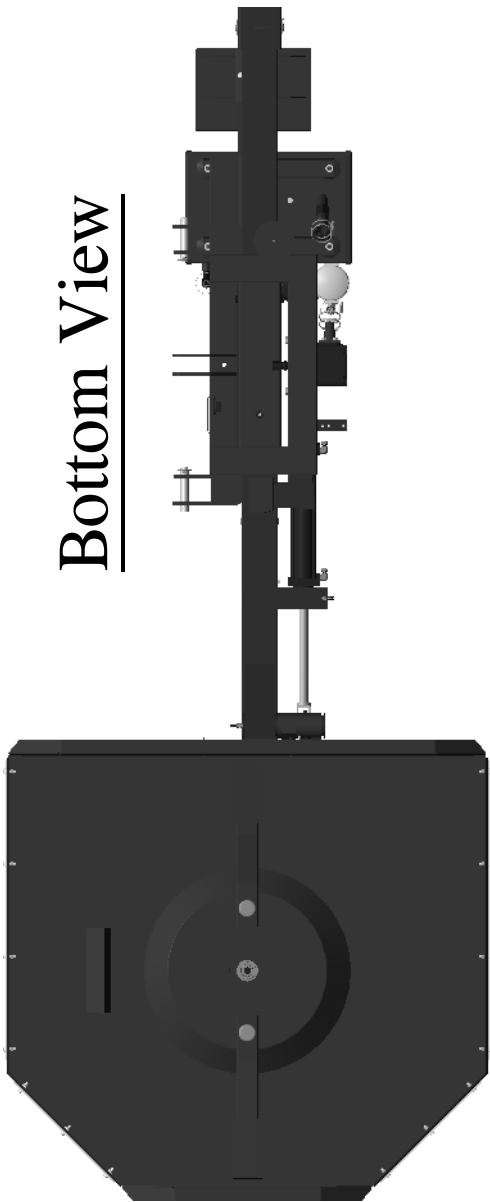


DWG. NO.	22720			REV.	G
REV	CHANGE	BY	DATE	ECN	
IR	INITIAL RELEASE	R.T.N.	8/16/04	---	
E	16682 Will Replace 10375 & 16435	T.B.B.	1/5/15	1578	
F	Manufacture Cylinder Change	T.B.B.	5/10/16	1655	
G	Pump 15240 Has Changed To Pump 16705	T.B.B.	12/14/16	1672	

Top View



Bottom View



DB4060 Complete

All Dimensions in Inches Unless Otherwise Specified Dimensions in [] are in Millimeters	
Tolerance Unless Otherwise Specified	
Fractional Dimensions $\pm 1/16"$	Angular Dimensions $\pm 1^\circ$
Decimal Dim. to Limits Shown	
All Holes to be $+0 -1/32"$	

MODELED BY		T.B.B.	1/5/15	HARDEE BY EVH MFG. CO. LORIS S.C.	
DRAWN BY		R.T.N.	1/5/15	DESCRIPTION	SHEET 2 of 7
MATERIAL		R.M.N.		DB4060 Complete	
Manufactured By: EVH Mfg. Co., LLC		N/A		DO NOT SCALE	B DWG. NO. 22720

Hitch Frame & Components

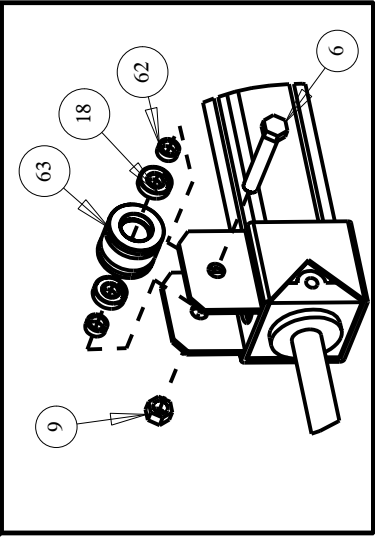
DWG. NO.		22720		REV.	
REV	CHANGE	BY	DATE	G	
IR	INITIAL RELEASE	R.T.N.	8/16/04	---	
E	16682 Will Replace 10375 & 16435	T.B.B.	1/5/15	1578	
F	Manufacture Cylinder Change	T.B.B.	5/10/16	1655	
G	Pump 15240 Has Changed To Pump 16705	T.B.B.	12/14/16	1672	

Item	Part Number	Qty.	Description
1	10002	2	Hex Bolt, 1/4"-20 X 1" Gr.5 Plated
2	10003	1	HEX BOLT (1/4" X 1-1/2" GR. 5 PLATED)
3	10006	8	Hex Bolt 1/4" x 3" gr.5 plated
4	10032	1	Hex Bolt 3/8 x 1-1/2 gr.5 plated
5	10092	2	Hex Bolt 5/8 x 2 gr.5 plated
6	10096	1	Hex Bolt 5/8"-11 x 4" gr.5 Plated
7	10153	9	Lock Nut, 1/4" Plated
8	10164	2	1/2" Hex Nut (Gr.5 Plated)
9	10166	9	Lock Nut 5/8"-11 plated
10	10175	1	3/8"-16 Locknut (Gr.5 Plated)
11	10176	6	1/2" Locknut (Gr.5 Plated)
12	10200	4	1/4" Plated Flatwasher
13	10202	2	3/8" Flatwasher (Plated)
14	10204	8	1/2 Flatwasher (Plated)
15	10207	8	Flatwasher, 1" plated
16	10252	8	Cotter Pin 3/16" X 2" Plated
17	10346	2	3 pt. Snap Pin (Lynch Pin)
18	10363	2	Bearing for Cable Roller
19	10365	2	Clamp, 1/2" Plated Steel Loom
20	10368	1	1-1/4" Gate Valve
21	10384	8	Wire Rope Clip.1/4" Forged
22	10390	1	Clip Pin (1/8 x 2)
23	10393	1	Universal Clip Pin
24	10466	2	Cat. 2 Lower Hitch Pin
25	10501	1	FLOW EZY BREATHER
26	11005	1	Decal, Warning - Thrown Objects
27	11010	3	Large Hardee Logo Decal
28	11675	1	Return Filter Assembly
29	11703	1	3/4" Street Elbow
30	11850	1	Web Site Decal
31	13214	2	SAFETY CHAIN CLEVIS WITH PIN
32	13532	2	CLAMP, SIZE 3/4" TO 1-3/4" X 9/16"
33	13535	4	STAINLESS STEEL CLAMP, 1-1/2" TO 1-3/4"
34	13557	1	3/4"-M-NPT X 3/4" Metal Hose Barb
35	13563	1	1-1/4"-M-NPT X 1-1/2" Metal Hose Barb
36	13632	1	1/4" NPT Metal Cap
37	13757	1	20-M-NPT X 16-F-NPT Reducer
38	13899	4	#6 JIC CAP
39	13906	4	ELBOW, 6-M-JIC X 8-M-NPT 90 DEG
40	13976	3	12-M-JIC X 12-M-NPT 90 Deg. Elbow

All Dimensions in Inches Unless Otherwise Specified
Dimensions in [] are in Millimeters
Tolerance Unless Otherwise Specified
Fractional Dimensions ± 1/16"
Angular Dimensions ± 1°
Decimal Dim. to Limits Shown
All Holes to be +0 -1/32"

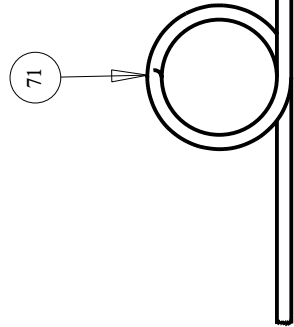
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DRAWN BY	R.T.N.	1/5/15	EVH MFG. CO.	
MATERIAL		R.M.N.	DESCRIPTION	LORIS S.C.
Manufactured By: EVH Mfg. Co., LLC		N/A	DB4060 Complete	
DO NOT SCALE	B	DWG. NO.	22720	

Detailed view A



Hitch Frame
&
Components

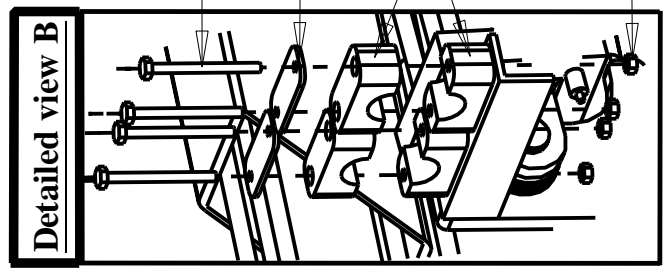
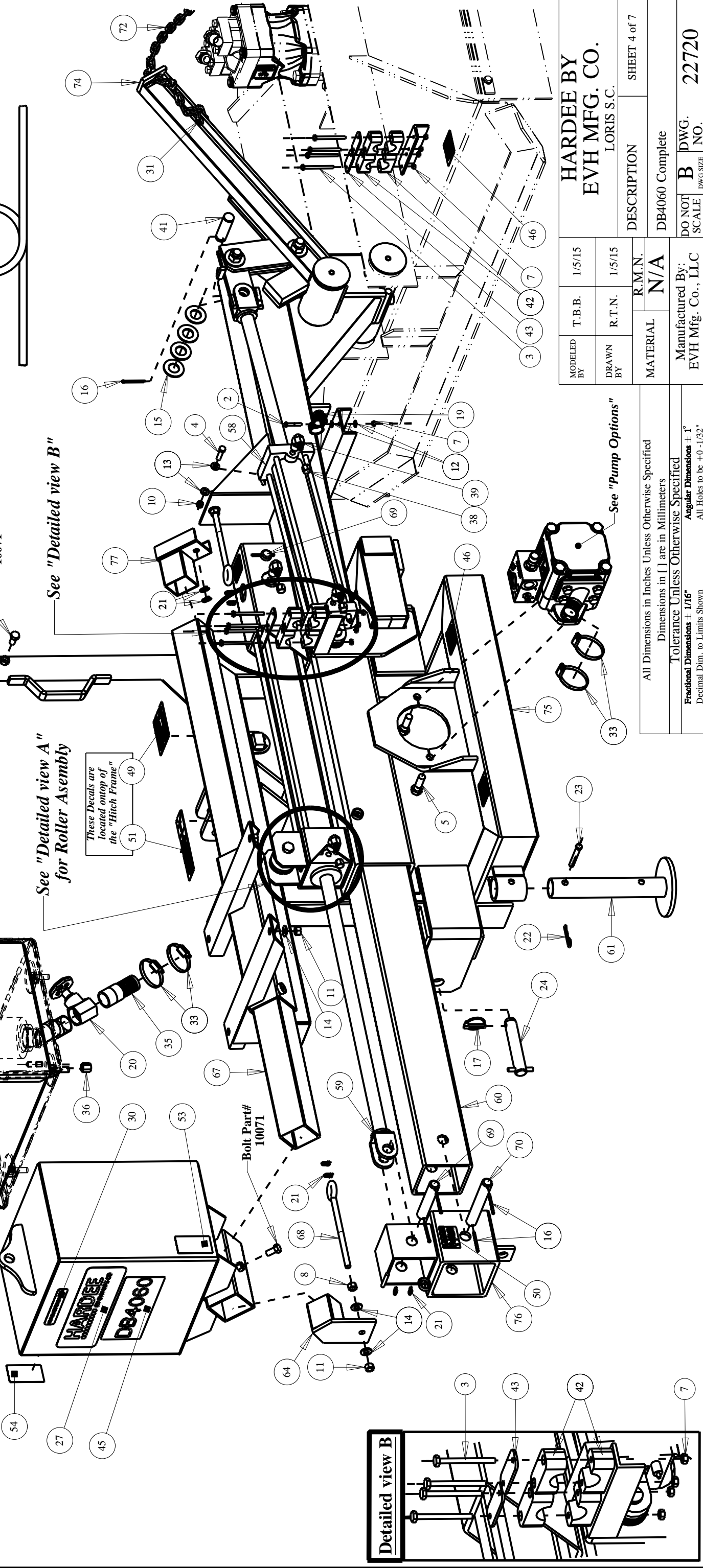
DWG. NO.		22720		REV.		G
REV	CHANGE	BY	DATE	ECN		
IR	INITIAL RELEASE	R.T.N.	8/16/04	---		
E	16682 Will Replace 10375 & 16435	T.B.B.	1/5/15	1578		
F	Manufacture Cylinder Change	T.B.B.	5/10/16	1655		
G	Pump 15240 Has Changed To Pump 16705	T.B.B.	12/14/16	1672		



See "Detailed view A" for Roller Assembly

See "Detailed view B"

These Decals are located on top of the "Hitch Frame"



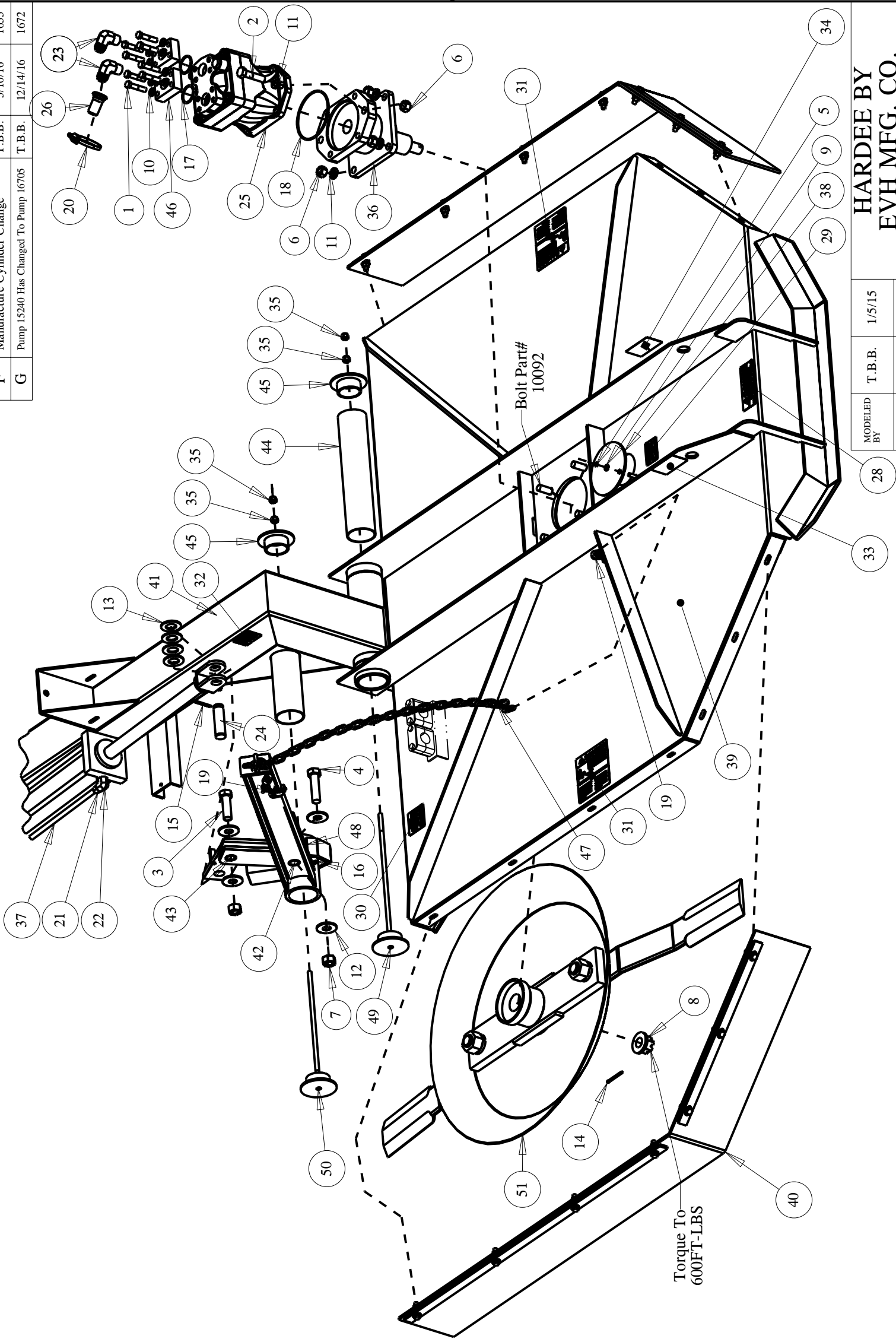
MODELED BY	T.B.B.	1/5/15	HARDEE BY	
DRAWN BY	R.T.N.	1/5/15	EVH MFG. CO.	
			LORIS S.C.	
MATERIAL		R.M.N.	DESCRIPTION	SHEET 4 of 7
		N/A	DB4060 Complete	
Manufactured By:		DO NOT SCALE	B	DWG. NO.
EVH Mfg. Co., LLC				22720

All Dimensions in Inches Unless Otherwise Specified
Dimensions in [] are in Millimeters
Tolerance Unless Otherwise Specified
Fractional Dimensions $\pm 1/16"$
Angular Dimensions $\pm 1^\circ$
Decimal Dim. to Limits Shown
All Holes to be $+0 -1/32"$

Item	Part Number	Qty.	Description
1	10052	8	Hex Bolt 7/16 x 2 gr.5 plated
2	10093	2	Hex Bolt 5/8" x 2-1/2" gr.5 plated
3	10112	1	Hex Bolt 3/4" X 2-1/2" gr.5 Plated
4	10113	1	Hex Bolt 3/4" X 3" gr.5 Plated
5	10154	1	Lock Nut 5/16"-18 Plated
6	10166	6	Lock Nut 5/8"-11 plated
7	10168	2	3/4"-10 Locknut (Gr.5 Plated)
8	10173	1	1" Castle Flange Nut
9	10181	1	Lockwasher 5/16" plated
10	10183	8	Lockwasher 7/16 plated
11	10185	6	Lockwasher 5/8" Plated
12	10206	4	Flatwasher 3/4 plated
13	10207	8	Flatwasher, 1" plated
14	10247	1	Cotter Pin 3/16" X 1 1/4" Plated
15	10252	2	Cotter Pin 3/16" X 2" Plated
16	10322	1	1/4" Grease Fitting, 1/4"-28 Threaded
17	10386	2	O-ring
18	10388	1	O-Ring
19	13214	2	SAFETY CHAIN CLEVIS WITH PIN
20	13532	1	CLAMP, SIZE 3/4" TO 1-3/4" X 9/16"
21	13899	2	#6 JIC CAP
22	13906	2	ELBOW, 6-M-JIC X 8-M-NPT 90 DEG
23	13976	2	12-M-JIC X 12-M-NPT 90 Deg. Elbow
24	15015	2	PIN - CYLINDER LINK
25	15242	1	Hydraulic Vane Motor
26	15268	1	FITTING, 3/4" HB X 12-F-JIC
27	15845	1	Hydraulic Decal Kit
28	15845-1	1	DANGER DECAL (KIT 15845)
29	15845-10	1	WARNING DECAL (KIT 15845)
30	15845-11	1	WARNING DECAL (KIT 15845)
31	15845-16	2	DANGER DECAL (KIT 15845)
32	15845-3	2	WARNING DECAL (KIT 15845)
33	15852	1	Red Reflector Decal
34	15853	1	Yellow Reflector Decal
35	16138	4	Lock Nut 7/16"-14 NC with Nylon Insert
36	16577	1	Hydraulic Motor Housing Assembly
37	16748	1	Cylinder, 3"X 18" With 1-1/4" Rod & 1" Pins
38	20031	1	Access Cover
39	22722	1	DB4060 Deck Weldment
40	22728	2	DB4060/LR50160 Rubber Belting Kit
41	22733	1	WELDMENT, Extension Arm, DB4060
42	23123	1	BUSHING FOR LIFT ARM (.824 I.D. X 1 1/2" LG.)
43	23124	1	BUSHING FOR LIFT ARM (.824 I.D. X 1 1/4" LG.)
44	23130	1	Pivot Sleeve
45	23131	2	End Cap Weldment
46	23136	2	Pressure Flange
47	23149	1	WELDMENT, Lift Chain
48	23159	1	WELDMENT, LIFT ARM ASSEMBLY
49	23345	1	Head Mounting Bracket Weldment
50	23359	1	Head Mount Bracket Weldment
51	23448	1	BLADE Holder W/Blades, W/Anti Wrap Hub

Belting, Motor & Blade Holder

DWG. NO.		22720		REV.		G	
REV	CHANGE	BY	DATE	ECN			
IR	INITIAL RELEASE	R.T.N.	8/16/04	---			
E	16682 Will Replace 10375 & 16435	T.B.B.	1/5/15	1578			
F	Manufacture Cylinder Change	T.B.B.	5/10/16	1655			
G	Pump 15240 Has Changed To Pump 16705	T.B.B.	12/14/16	1672			



<div>33</div>	<div>28</div>	MODELED BY		T.B.B.	1/5/15	HARDEE BY	
		DRAWN BY		R.T.N.	1/5/15	EVH MFG. CO.	
						LORIS S.C.	
		MATERIAL		R.M.N.		DESCRIPTION	SHEET 5 of 7
				N/A		DB4060 Complete	
All Dimensions in Inches Unless Otherwise Specified Dimensions in [] are in Millimeters		Manufactured By: EVH Mfg. Co., LLC					
Tolerance Unless Otherwise Specified							
Fractional Dimensions ± 1/16"							
Decimal Dim. to Limits Shown							
Angular Dimensions ± 1°							
All Holes to be +0 -1/32"							
		DO NOT SCALE		B DWG. NO.		22720	

All Dimensions in Inches Unless Otherwise Specified

Dimensions in [] are in Millimeters

Tolerance Unless Otherwise Specified

Fractional Dimensions ± 1/16" Angular Dimensions ± 1°

Decimal Dim. to Limits Shown All Holes to be +0 -1/32"

NOTES:

Hydraulic Schematic

DWG. NO.		22720		REV.	
REV	CHANGE	BY		DATE	ECN
IR	INITIAL RELEASE	R.T.N.		8/16/04	---
E	16682 Will Replace 10375 & 16435	T.B.B.		1/5/15	1578
F	Manufacture Cylinder Change	T.B.B.		5/10/16	1655
G	Pump 15240 Has Changed To Pump 16705	T.B.B.		12/14/16	1672

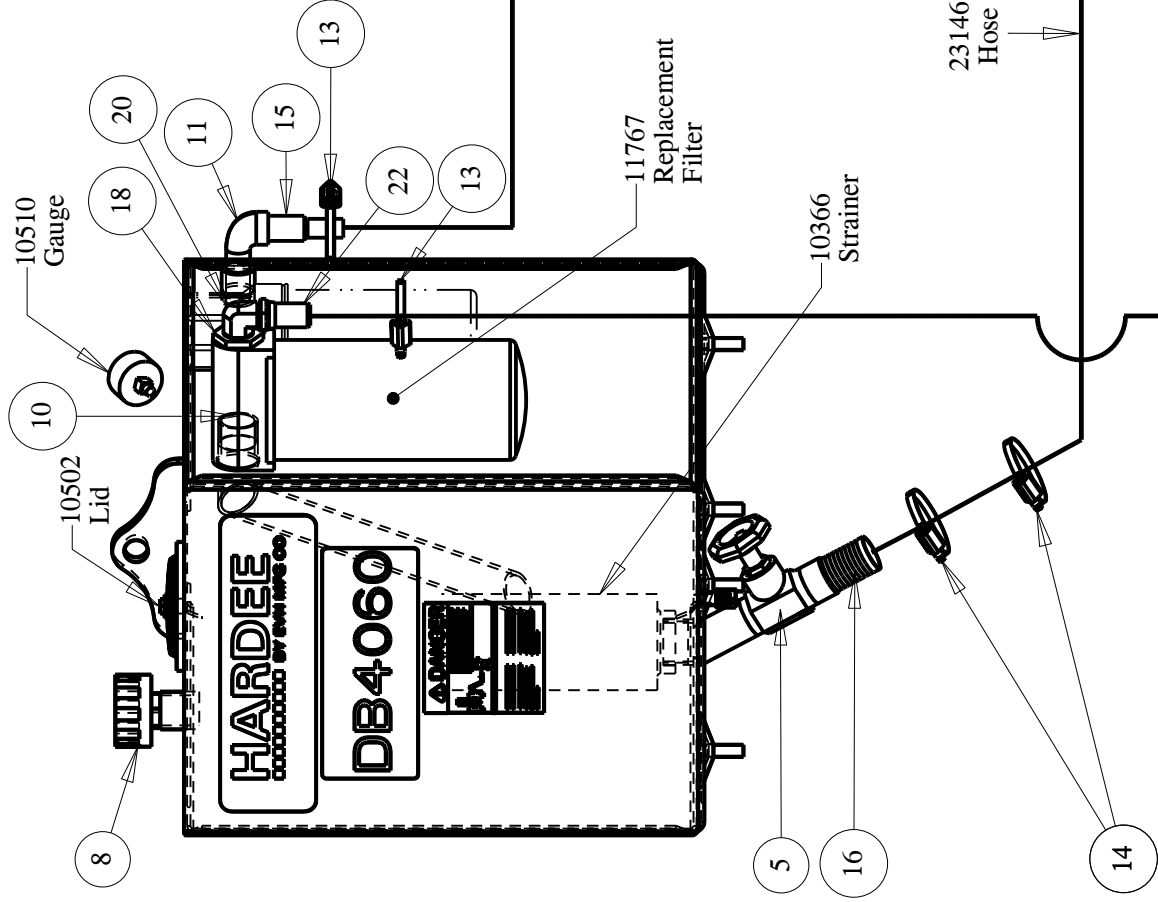
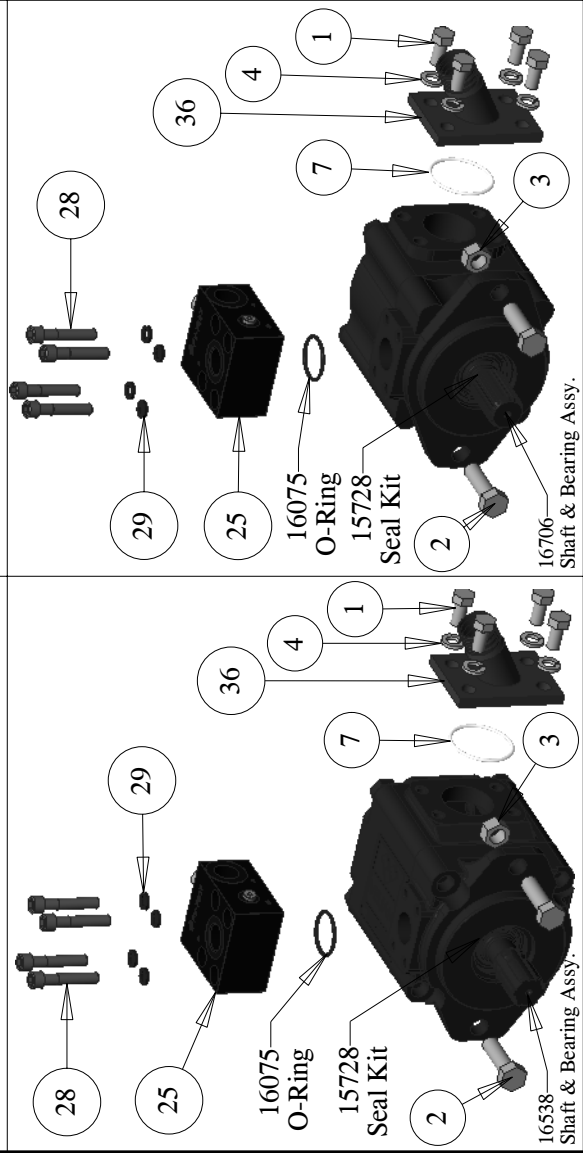
1	10071	8	Hex Bolt 1/2 x 1 gr.5 plated	26	16683	1	Relief Valve 2700 PSI - w/TAMPER PROOF CAP
2	10092	4	Hex Bolt 5/8 x 2 gr.5 plated	27	16684	1	Fitting, #12 HB/ M-ORB Straight
3	10166	4	Lock Nut 5/8"-11 plated	28	16685	8	Screw, 7/16-14 X 2-1/4 long - Zinc Plated
4	10184	8	Lockwasher 1/2 plated	29	16686	8	Lock Washer, Zinc Plated 7/16 High Collar
5	10368	1	1-1/4" Gate Valve	30	16697	1	ORB Hollow Hex Plug
6	10373	1	Hydraulic Oil	31	16705	1	Hydraulic 1000RPM Pump
7	10387	2	O-ring	32	16748	1	Cylinder, 3"X 18" With 1-1/4" Rod & 1" Pins
8	10501	1	FLOW EZY BREATHER	33	16749	1	CYLINDER, 3" X 30" TIE ROD , DBs
9	10646	2	Grease	34	22739	1	3/4" x 146" RETURN HOSE
10	11675	1	Return Filter Assembly	35	23101	1	Weldment, Oil Tank
11	11703	1	3/4" Street Elbow	36	23137	2	Fluid Connector
12	11775	1	Hydraulic 540RPM Pump	37	23146	1	SUCTION HOSE (1 1/2" X 24")
13	13532	3	CLAMP, SIZE 3/4" TO 1-3/4" X 9/16"	38	23157	1	RETURN HOSE, 3/4 X 42"

14	13535	6	STAINLESS STEEL CLAMP, 1-1/2" TO 1-3/4"	<div>Hardee By EVH Mfg. Co., LLC</div> <div>22720</div> <div>22720</div>			
15	13557	1	3/4"-M-NPT X 3/4" Metal Hose Barb				
16	13563	1	1-1/4"-M-NPT X 1-1/2" Metal Hose Barb				
17	13632	1	1/4" NPT Metal Cap				
18	13757	1	20-M-NPT X 16-F-NPT Reducer				
19	13906	4	ELBOW, 6-M-JIC X 8-M-NPT 90 DEG				
20	13976	1	12-M-JIC X 12-M-NPT 90 Deg. Elbow				
21	15242	1	Hydraulic Vane Motor				
22	15268	1	FITTING, 3/4" HB X 12-F-JIC				
23	15269	1	3/4" 140" HYDRAULIC PRESSURE HOSE				
24	16012	1	Firting,12 F50X-S Straight Thread Connector				
25	16682	2	Relief Valve Assy. - 2700 PSI - Pump Mounted				
				All Dimensions in Inches Unless Otherwise Specified Dimensions in [] are in Millimeters Tolerance Unless Otherwise Specified Fractional Dimensions ± 1/16" Angular Dimensions ± 1° Decimal Dim. to Limits Shown All Holes to be +0 -1/32"			
MODELED BY		T.B.B.	1/5/15	HARDEE BY EVH MFG. CO. LORIS S.C.			
DRAWN BY		R.T.N.	1/5/15				
MATERIAL		R.M.N.		DESCRIPTION			
Manufactured By: EVH Mfg. Co., LLC		N/A		DB4060 Complete			
				DO NOT SCALE	B	DWG. NO.	22720

Pump Options

540 RPM - P/N: 11775

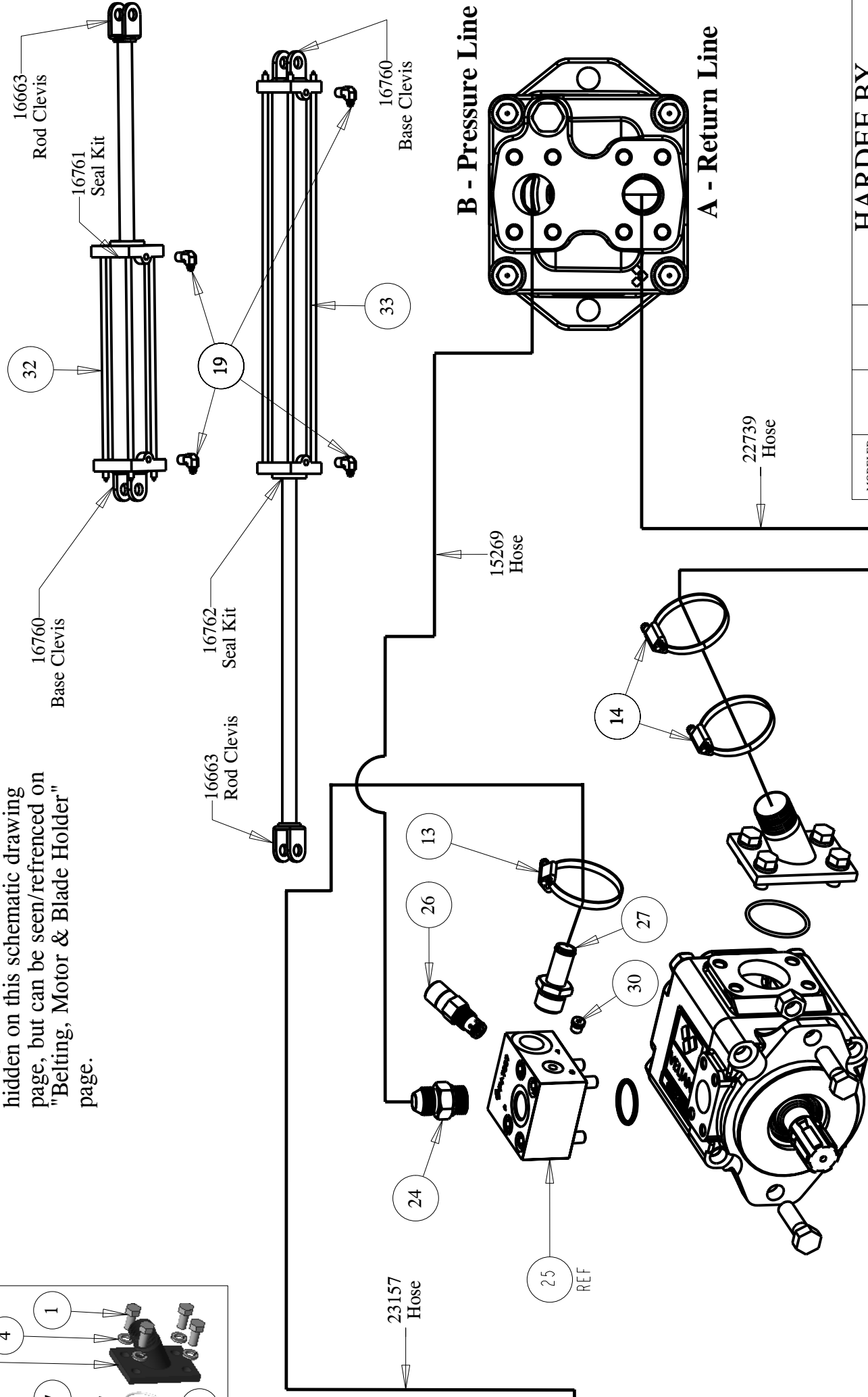
1000 RPM - P/N: 16705



Hydraulic Schematic

Note:

Fittings on deck motor have been hidden on this schematic drawing page, but can be seen/referenced on "Belting, Motor & Blade Holder" page.

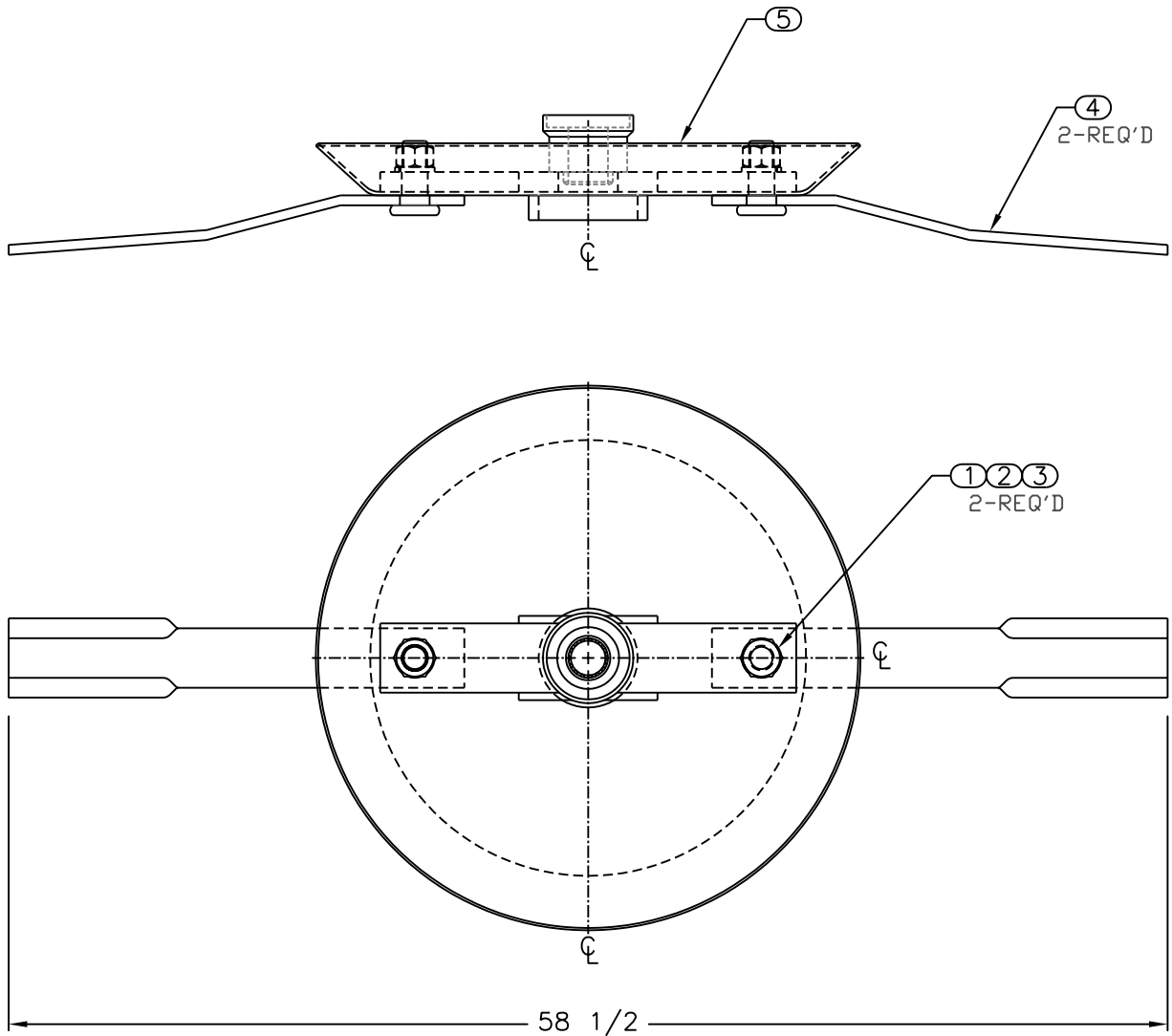


DWG. NO.	22720			REV.	G
REV	CHANGE	BY	DATE	ECN	
IR	INITIAL RELEASE	R.T.N.	8/16/04	---	
E	16682 Will Replace 10375 & 16435	T.B.B.	1/5/15	1578	
F	Manufacture Cylinder Change	T.B.B.	5/10/16	1655	
G	Pump 15240 Has Changed To Pump 16705	T.B.B.	12/14/16	1672	

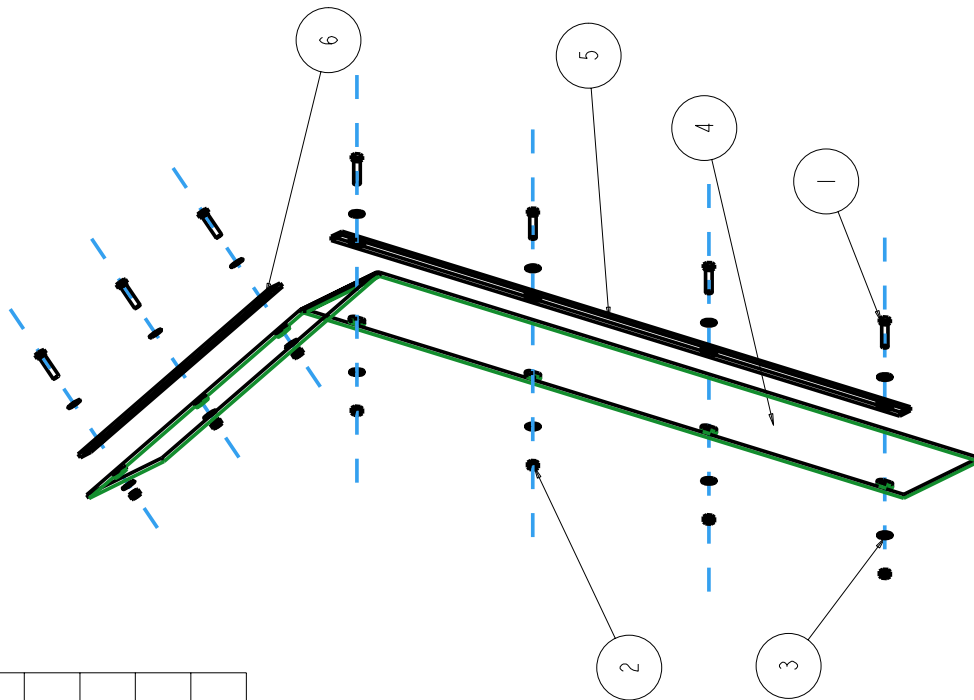
MODELED BY	T. B. B.	1/5/15	HARDEE BY EVH MFG. CO. LORIS S.C.		
	DRAWN BY	R. T. N.	1/5/15	DESCRIPTION	SHEET 7 of 7
MATERIAL		R.M.N.		DB4060 Complete	
		N/A			
Manufactured By: EVH Mfg. Co., LLC			DO NOT SCALE	B DWG SIZE	DWG. NO. 22720

Part Number 23448 DB4060 Blade Holder

ITEM NO.	PART NUMBER	QTY REQD.	NOMENCLATURE OR DESCRIPTION
1	10311	2	BLADE BOLT NUT GR.8
2	10312	2	BLADE BOLT LOCKWASHER GR.8
3	10313	2	BLADE BOLT GR.8
4	10331	2	NON-DIRECTIONAL BLADE
5	23449	1	BLADE HOLDER WELDMENT



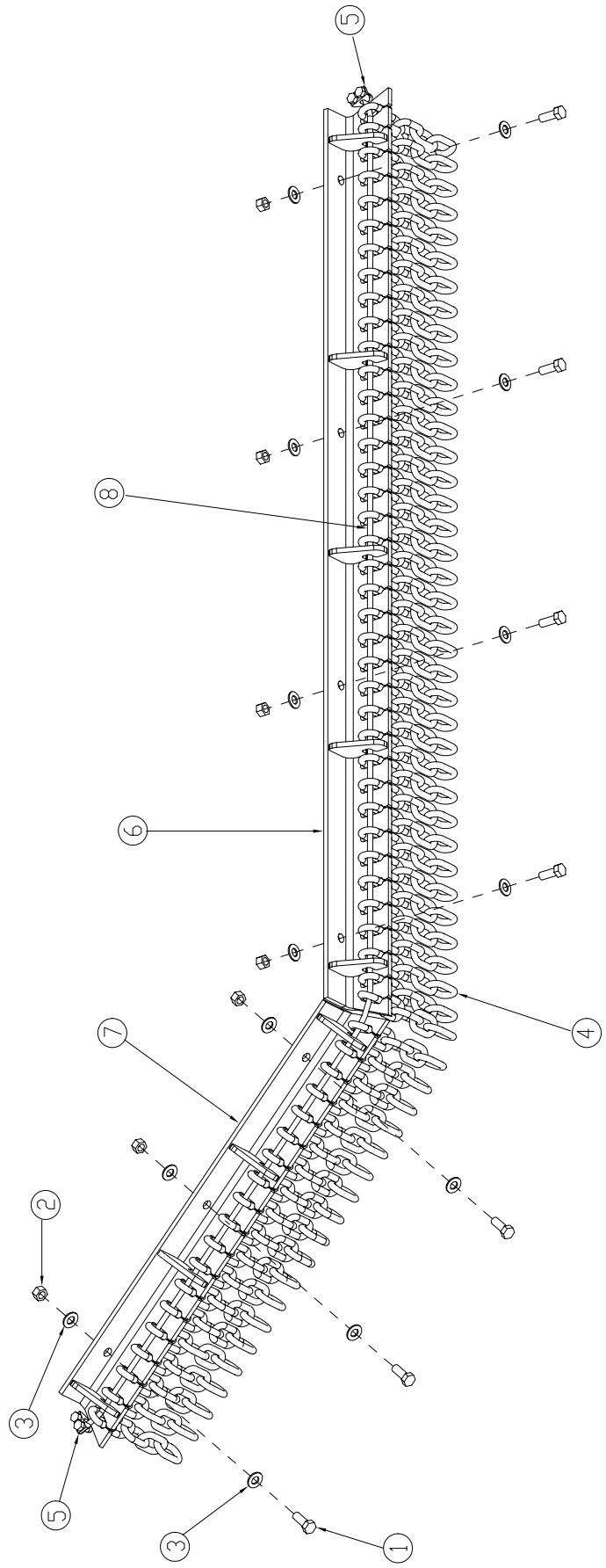
Item	Part Number	Qty.	Description	DWG. NO.	22728	REV.	IR
1	10032	7	Hex Bolt 3/8 x 1-1/2 gr.5 plated	REV	CHANGE	BY	DATE
2	10175	7	3/8" Locknut (Gr.5 Plated)	IR	INITIAL RELEASE	J.O.C.	11/20/03
3	10202	14	3/8" Flatwasher (Plated)				
4	22729	1	DB4060 Rubber Belting				
5	22730	1	Long Rubber Belting Flat				
6	22731	1	Short Rubber Belting Flat				



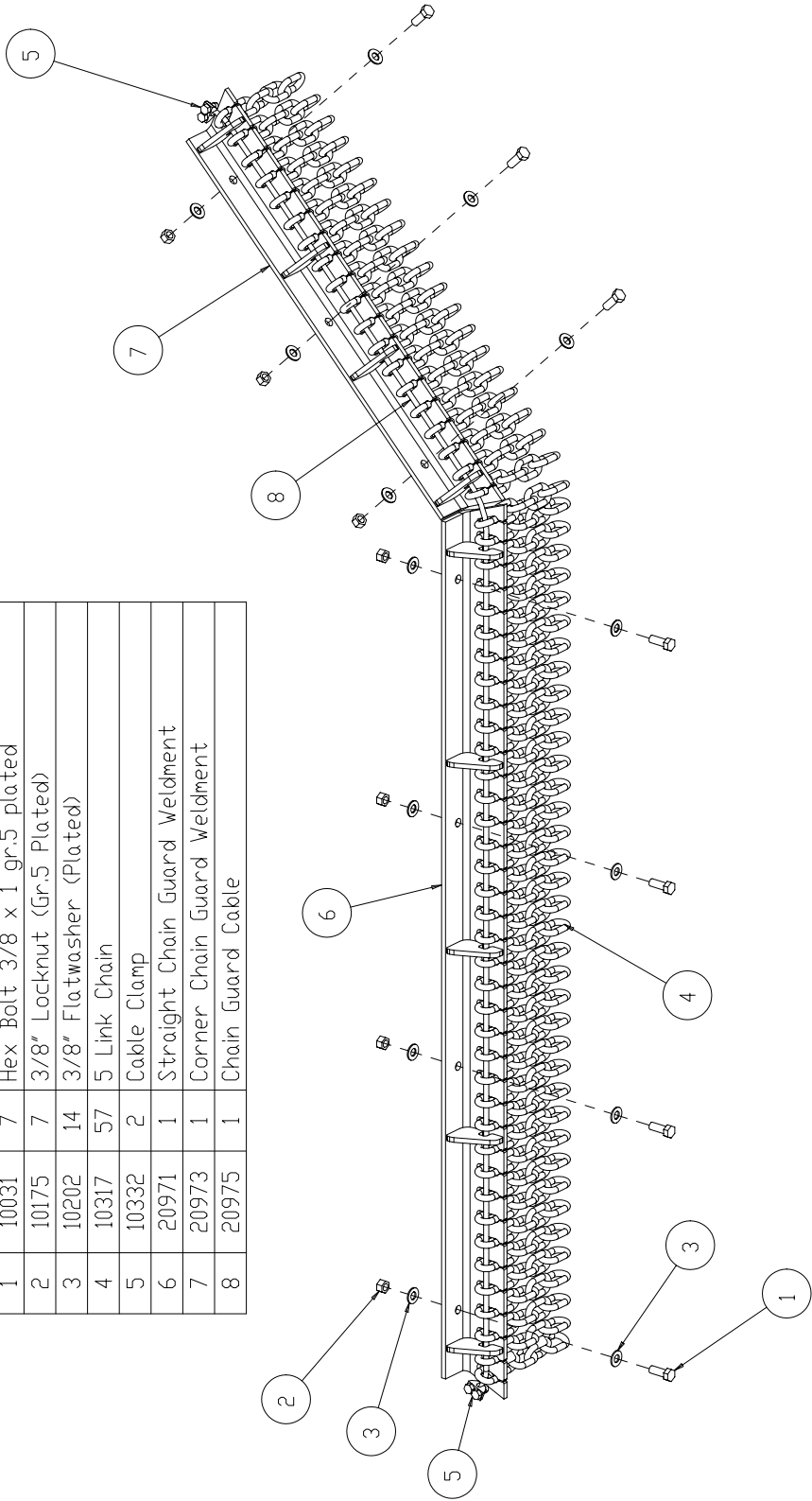
DRAWN BY	J.O.C.	11/20/03	EVH MFG. CO. LORIS S.C.	
CHECKED BY	R.T.N.	12/23/03	DESCRIPTION	
MATERIAL		R.M.N.	SHEET 1 of 1	
		N/A	DB4060 Rubber Belting Kit	
Manufactured by: EVH MFG. CO. LLC		DO NOT SCALE	A	DWG. NO. 22728

All Dimensions in Inches Unless Otherwise Specified
 Dimensions in [] are in Millimeters
 Tolerance Unless Otherwise Specified
 Fractional Dimensions $\pm 1/16"$ Angular Dimensions $\pm 1^\circ$
 Decimal Dim. to Limits Shown All Holes to be $+0 -1/32"$

Parts Listing For DB4060 Front Chain Guard (P/N 20970)		
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 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



PARTS LISTING FOR DB4060 REAR CHAIN GUARD (P/N 20976)			
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



Bolt Torque

Checking Bolt Torque

The tables shown below give 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 cap screws unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

NOTE: Bolt Torques shown are maximum allowable values for ultimate safe working strength or external load-carrying capacity. The bolt torque are not applicable in cases where bolts are used as a pin-like device, holding together two or more movable objects and keeping them from spreading apart. – “Clamping Torque” Being dependent upon the application of the bolt. -

*Torque value for bolts and cap screws are identified by their head markings.
See Page 2*

Torque Specifications for Coarse Threads

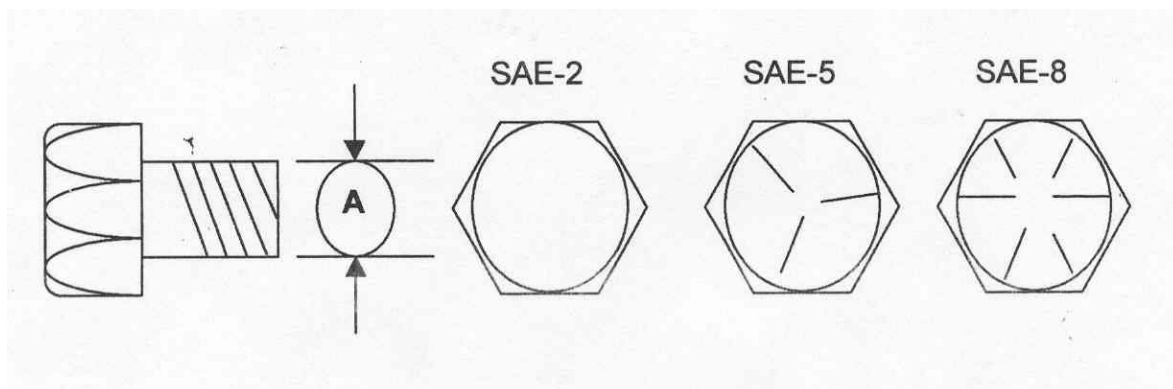
Diameter “A”	Bolt Torque		Coarse Thread			
	SAE-2		SAE-5		SAE-8	
	LB-FT	N.m	LB-FT	N.m	LB-FT	N.m
1/4" - 20	6	8	9	12	12	17
5/16" - 18	10	13	19	25	27	36
3/8" - 16	20	27	33	45	45	63
7/16" - 14	30	41	53	72	75	100
1/2" - 13	45	61	80	110	115	155
9/16" - 12	70	95	115	155	165	220
5/8" - 11	95	128	160	215	220	305
3/4" - 10	165	225	290	390	400	540
7/8" - 9	170	230	420	570	650	880
1" - 8	225	345	630	850	970	1320
1 1/8" - 7	354	478	794	1072	1287	1737
1 1/4" - 7	500	675	1120	1512	1875	2531
1 3/8" - 6	655	884	1470	1985	2382	3216
1 1/2" - 6	870	1175	1950	2632	3161	4267

See next page for Torque Specifications for Fine Threads and Head Markings

Torque Specifications for Fine Threads

Diameter "A"	Bolt Torque					
	SAE-2		SAE-5		SAE-8	
	LB-FT	N.m	LB-FT	N.m	LB-FT	N.m
1/4" - 28	6	8	10	14	14	19
5/16" - 24	12	16	19	26	27	36
3/8" - 24	22	31	35	47	49	66
7/16" - 20	36	49	55	74	78	105
1/2" - 20	55	74	85	115	120	162
9/16" - 18	80	108	122	165	172	232
5/8" - 18	110	148	170	230	240	324
3/4" - 16	200	270	297	400	420	567
7/8" - 14	180	243	474	640	668	402
1" - 12	274	370	705	952	995	1343
1" - 14	280	378	721	973	1019	1376
1 1/8" - 12	397	536	890	1201	1444	1950
1 1/4" - 12	553	747	1241	1675	2012	2716
1 3/8" - 12	746	1007	1672	2257	2712	3661
1 1/2" - 12	979	1322	2194	2962	3557	4802

Head Markings



CALCULATION OF TIP SPEEDS FOR OFFSET CUTTERS

The following table of tip speeds is based upon equipment as specified:

Pump Ring No. 42
Pump Ring No. 28

Blade tip Diameter for
DB-4048 = 46”
DB-4060 = 58”
(Includes 5% for transmission loss)

Tractor PTO	Cutter Shaft	DB4048		DB4060	
		<u>Tip Speed</u>		<u>Tip Speed</u>	
<u>RPM</u>	<u>RPM</u>	FPM	MPH	FPM	MPH
500	785	9,450	107	11,900	135
600	855	10,300	117	13,000	148
650	925	11,150	127	14,050	160
800	1140	13,700	156	17,300	195
1000	1425	17,150	195	21,600	246

*****DO NOT EXCEED SPEED BELOW LINE*****

Hardee by EVH Manufacturing Co., LLC Hydraulic Mower Limited Warranty

Hardee by EVH Manufacturing Co., LLC warrants its **Hydraulic Mowers** for one year or **350 hours** (whichever comes first) to the **original** non-commercial, non-governmental, or non-municipal purchaser. For the **original** commercial, industrial, or municipal purchaser, the goods are warranted for 90 days or **350 hours** (whichever comes first) to be free from defects in material or workmanship.

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

Hardee by EVH Manufacturing Co., LLC **Hydraulic Mowers** include the following units: Miti Mike-35, Tiger SS, DB4048, DB4060, EV1442, MR1442, LR40142, LR40148, LR50148, LR50160, HR2360, and CM2160 Mowers.

The Warranty Card **must** be filled out and returned within **30 days** of purchase. **No** warranty will be allowed without a properly completed and returned warranty card.

“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 removing 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 by EVH Manufacturing Co., LLC 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 hours a day / 5 days a week.

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). Special purposes must be specifically disclosed to Hardee by EVH Manufacturing Co., LLC, and not merely to the dealer before your purchase. Hardee by EVH Manufacturing Co., LLC itself 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:



HARDEE



BY EVH MFG CO

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