

**LT35 Hydraulic Options
Log Loader/Turner
Safety, Operation, Maintenance
& Parts Manual**

HCA-A-35	rev. A1.03
HLA-A	rev. A1.00 - A3.02
HLT-A	rev. A1.00
HLTK-35	rev. A-G

Safety is our #1 concern!

August 2012

Form #1797

USED WITH LT35 MANUAL MILLS

HCA-A-35 is the **field installed** hydraulic control used with either the HLT-A or HLA-A or both

HLA-A is the **field installed** version of the Log Loader

HLT-A is the **field installed** version of the Log Turner

HLTK-35 is the **factory installed** version of the hydraulic loader, turner, and hydraulic control for a manual LT35 sawmill



WARNING! Read and understand this manual before using this machine.

California
Proposition 65 Warning



WARNING: Breathing gas/diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Always start and operate the engine in a well-ventilated area.
If in an enclosed area, vent the exhaust to the outside.
Do not modify or tamper with the exhaust system.
Do not idle the engine except as necessary.

For more information go to **www.P65warnings.ca.gov**.



WARNING: Drilling, sawing, sanding or machining wood products can expose you to wood dust, a substance known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection.

For more information go to **www.P65Warnings.ca.gov/wood**.

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Wood-Mizer, LLC has received patents that protect our inventions which are a result of a dedication to research, innovation, development, and design. Learn more at: woodmizer.com/patents

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Wood-Mizer, LLC
8180 West 10th Street
Indianapolis, Indiana 46214

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SECTION 1 INSTALLATION PROCEDURE

1.1 Overview

The hydraulic log loader and log turner are available as an option for **manual LT35 sawmills**. The option includes the three main components:

- **HCA-A-35 Hydraulic Control:** Dual-function hydraulic control pump/valve operates both the loader and turner.
- **HLA-A Hydraulic Log Loader:** Can be installed on all LT35 model sawmills. **NOTE:** HLA-A prior to Rev. A3.00 includes a single-function control pump/valve).
- **HLT-A Hydraulic Log Turner:** Can be installed on all LT35 model sawmills.

NOTE: If your mill has a **factory installed** hydraulic system (HTLK-35), go to the operations section.

1.2 Preparing The Sawmill For Installation

HLA-A Hydraulic Log Loader

1. Stop operation and lock out the sawmill.
2. Make sure the sawmill is setup firmly on level ground and all the outriggers/legs secure the sawmill frame.
3. Remove the loading ramps from the sawmill bed, if equipped.

PORTABLE SAWMILLS ONLY:

4. Raise the sawmill bed with the outriggers so that the tires are off the ground to allow relocation of the trailer axle for hydraulic loading arm kit installation.
5. Remove the four bolts securing the trailer axle to the sawmill bed.
6. Move the trailer axle approximately 3" toward the front end of the mill.
7. Install the two provided axle mount plates between the trailer axle and the sawmill bed as shown.
8. Use the four provided 1/2-13 hex head bolts, washers, and nuts to secure the axle mount plate to the sawmill bed.

NOTE: Make sure to install the bolts with the orientation and positions shown to allow sufficient clearance.

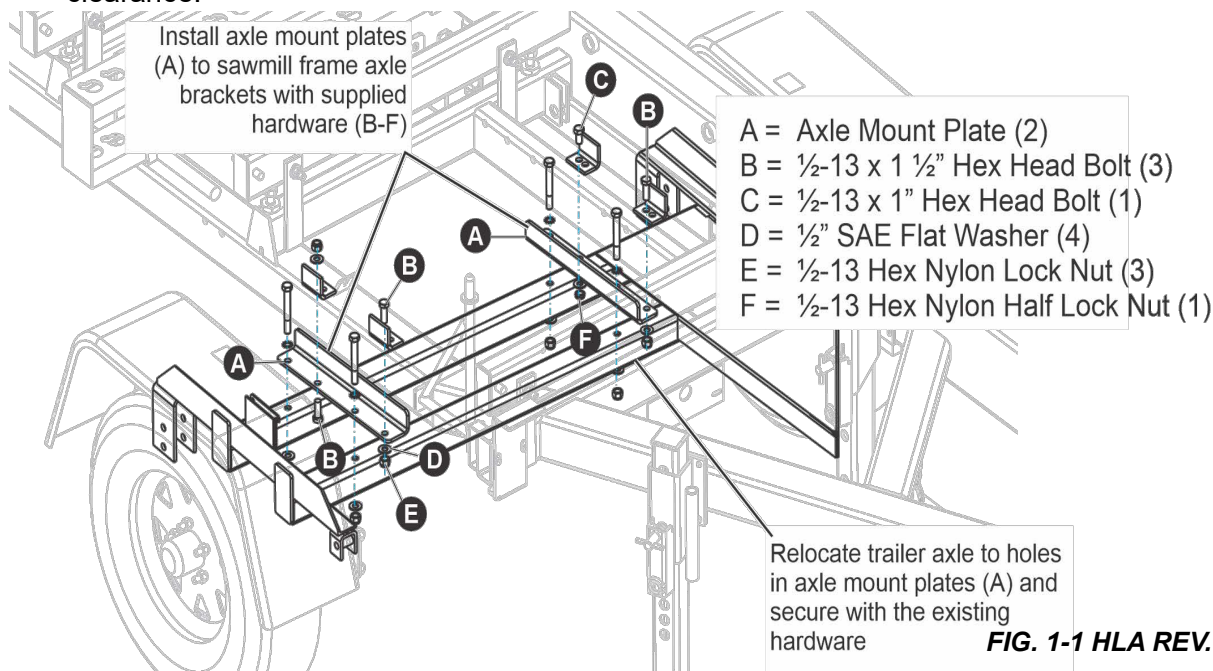


FIG. 1-1 HLA REV. A3.00+

9. Replace the four bolts, washers, and lock nuts to secure the trailer axle to the axle mount plates.

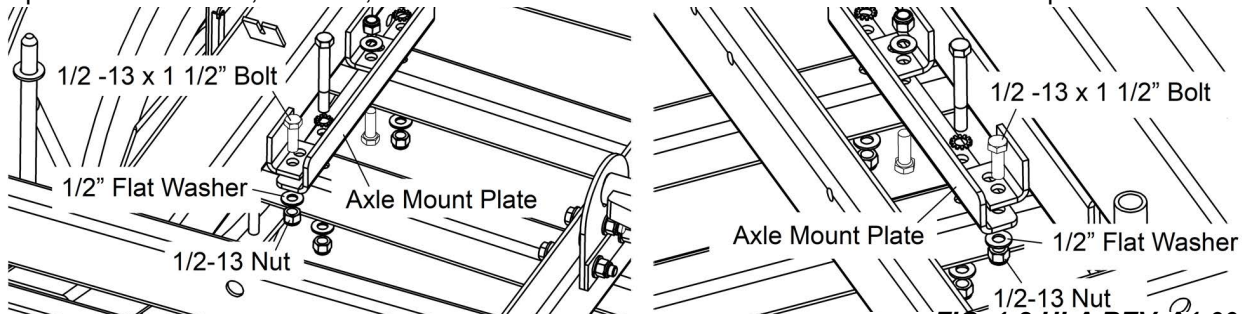


FIG. 1-2 HLA REV. A1.00 - A2.03

HLT-A Hydraulic Log Turner

1. Disassemble the front and rear manual side supports from the sawmill bed:
2. Remove the 1/4" clamping bolt, flat washers, and lock nut from each side support.
3. Remove the 1/2" bolt, washer and lock nut securing the side support pivot pin securing each side support to the bed frame.
4. Remove the pivot pin and lift the side support from the sawmill bed.
5. Retain the pivot pins and all hardware to install the hydraulic side supports later.

Remove front and rear side supports from sawmill frame

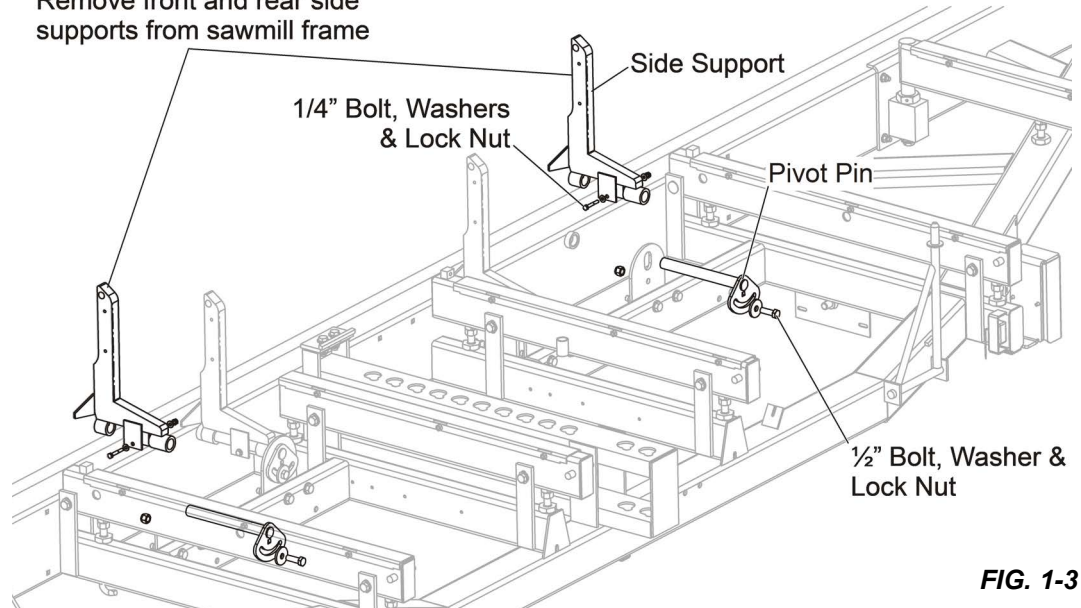


FIG. 1-3

1.3 Installation



WARNING! Disconnect the negative battery terminal cable before performing any service to the 12-volt electrical system. Failure to do so may cause injury or electrical system damage.

HCA-A-35 Hydraulic Control Box

1. Remove the cover and hydraulic pump from the provided pump box assembly.
2. Remove two nuts and washers securing the front outrigger/leg to the sawmill frame.

3. Place the hydraulic box against the sawmill main tube as shown.
4. Replace the two nuts and washers to the front outrigger/leg to secure the hydraulic box to the sawmill frame (do not tighten).
5. Use the single front hole in the back wall of the hydraulic box as a guide to drill a 3/8" hole in the main sawmill tube (one wall only).

NOTE: Make sure that wires inside the main tube are not affected by drilling.

6. Use the provided 3/8-16 x 1 1/2" hex head bolt, two 3/8" external star lock washers, two 3/8" flat washers, and a 3/8-16 jam nut to secure the hydraulic box to the main tube.
7. Place one star lock washer between the pump box and sawmill frame tube.
8. Insert the bolt through a flat washer, through the mounting hole in the frame tube and pump box and secure inside the box with a second star lock washer, flat washer and 3/8-16 hex jam nut.

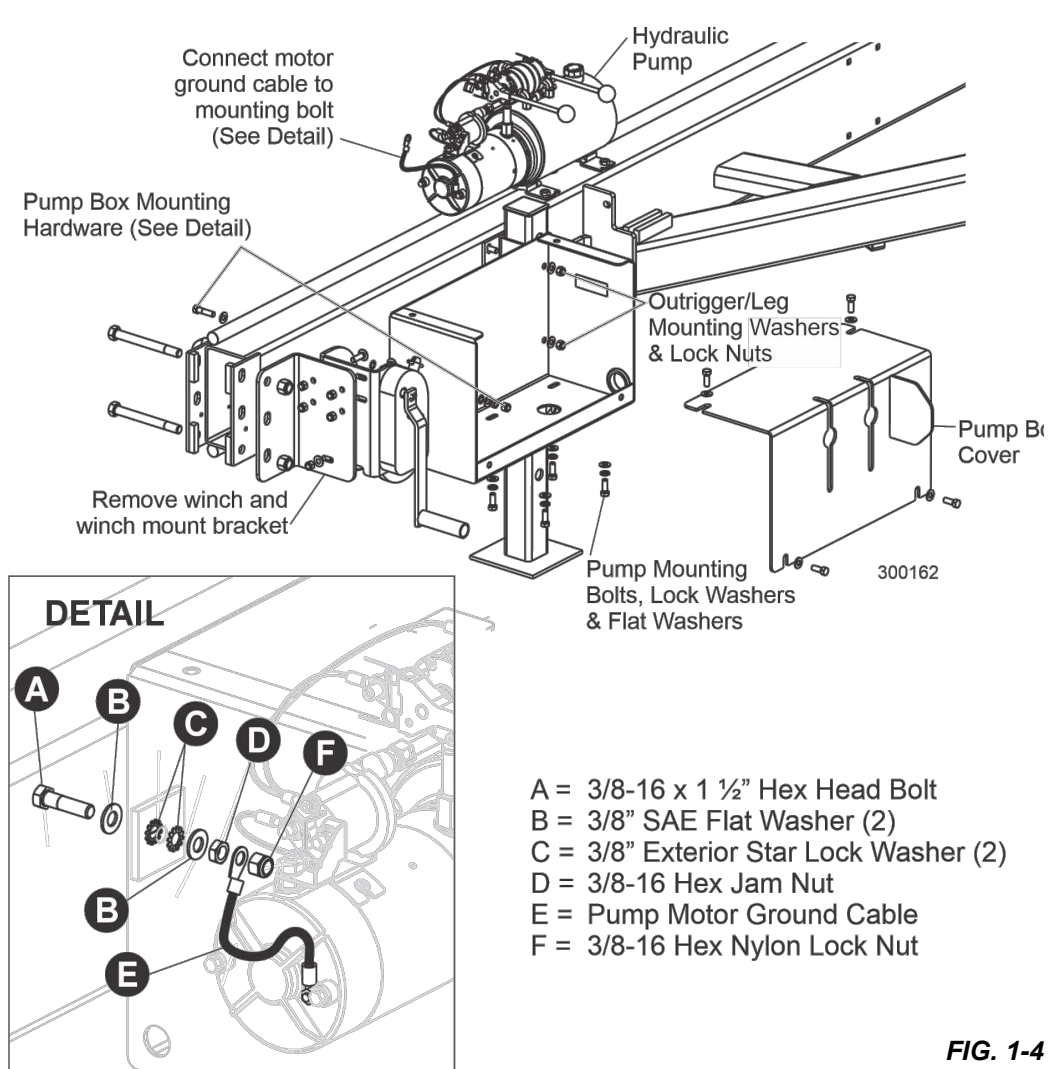


FIG. 1-4

9. Replace the hydraulic pump in the hydraulic box using the existing bolts (leave bolts loose).
10. Attach the motor ground cable to the 3/8-16 x 1 1/2" bolt and secure with the provided 3/8-16 lock nut.
11. Tighten the two outrigger mounting washers, and lock nuts at the rear of the pump box.
12. Temporarily install the box cover and check the operation of the pump handle(s) to insure they can be moved through their full range of motion.
13. If necessary, adjust the pump forward or back to allow proper operation of the handle(s).
14. Remove the box cover and tighten the pump mounting bolts.
15. Remove the winch and the winch mount bracket from the sawmill, if necessary.
16. Remove the pump reservoir cap and fill the reservoir with the hydraulic fluid provided.
17. Fill the reservoir to 3/4" of the top.

NOTE: In this application, the pump is NOT shipped with the fluid installed. Install the fluid before attempting to operate the pump. The decal specifying the hydraulic fluid level is provided as a reminder for future service.

18. Reinstall the pump reservoir cap.
19. Leave the pump box cover off until hydraulic components are installed later.

20. Install the contact strip to the main tube with the cable toward the front of the mill.
21. Secure one end of the strip to the main tube with the provided 1/4" x 1/2" self-tapping screws.
22. Route the cable under the main tube and in the side of the hydraulic box, securing the wire grommet to the hole in the pump box.
23. Connect the contact strip cable to the solenoid terminal as shown.
24. Remove the battery box cover and disconnect the negative wire from the battery.
25. Note all connections before removing so you can replace the wires correctly.

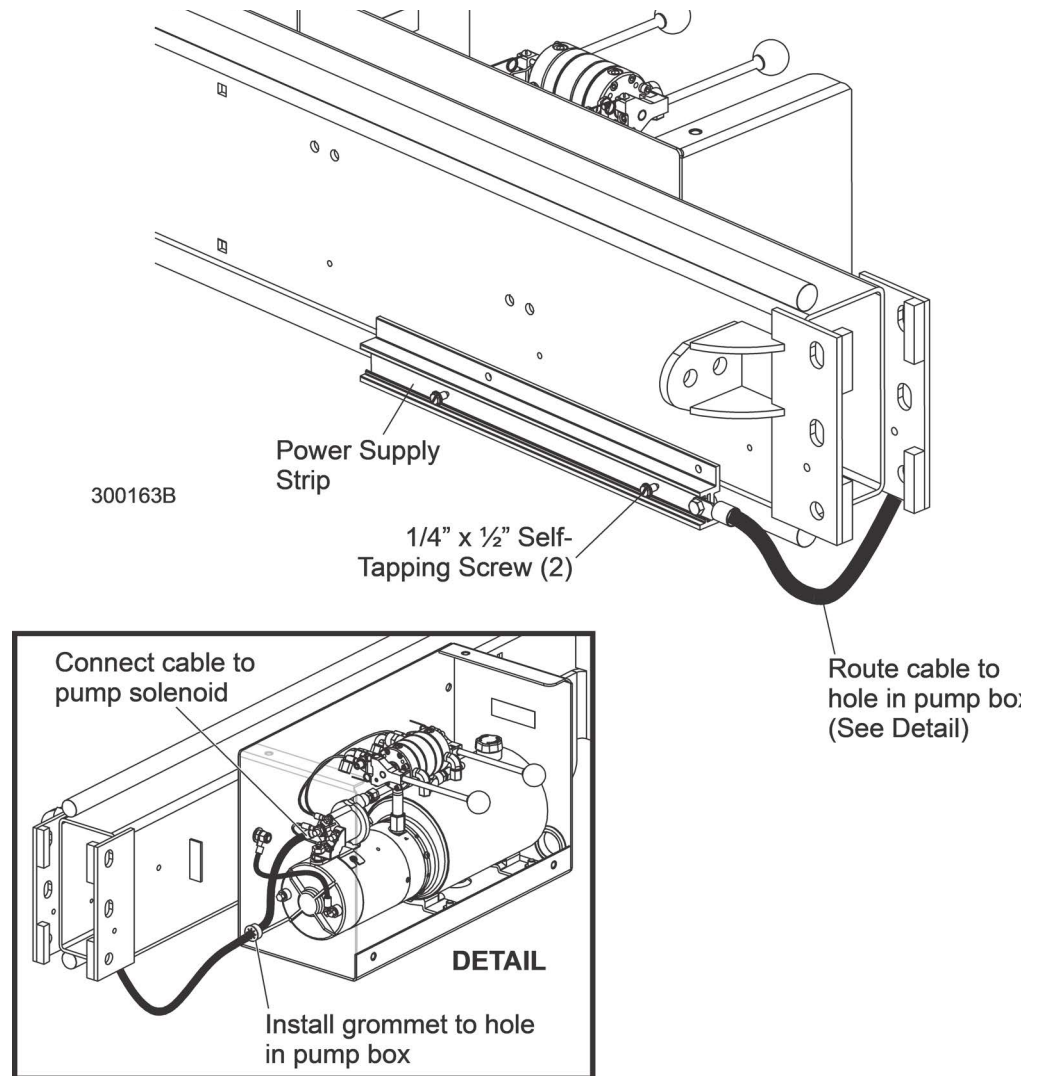


FIG. 1-5 (DUAL-FUNCTION PUMP SUPPLIED AFTER 7/10 SHOWN)

26. Replace the existing plastic wire grommet with the provided 5/8" rubber grommet in the right side of the battery box.
27. Remove the hole plugs to assemble the contact mount plate and the negative contact assembly to the battery box as shown.

NOTE: Loosen the battery hold down plate and move the battery to install the hex head bolts, if necessary. Make sure the negative contact springs are firmly compressed and solid contact is made with the bottom main tube rail.

NOTE: It may be necessary to remove paint from the bottom of the main tube rail for the first seven feet at the front end of the sawmill to ensure contact with the negative contact assembly.

28. Route the negative contact cable through the rubber grommet in the right side of the battery box and connect to the negative battery terminal.

29. Install the positive contact assembly and the positive contact spacer plate to the contact mount plate with the provided bolts and nylon lock nuts as shown.

30. Push the contact assembly away from the main tube of the mill and lightly tighten the bolts.

31. This assembly will be adjusted later after assembly is complete.

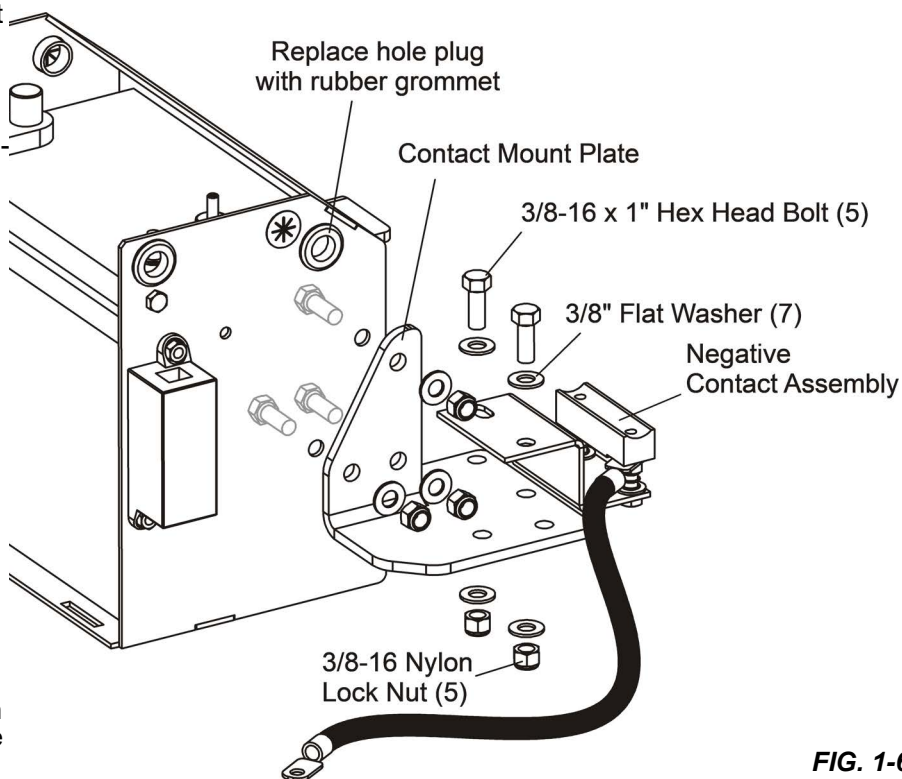


FIG. 1-6

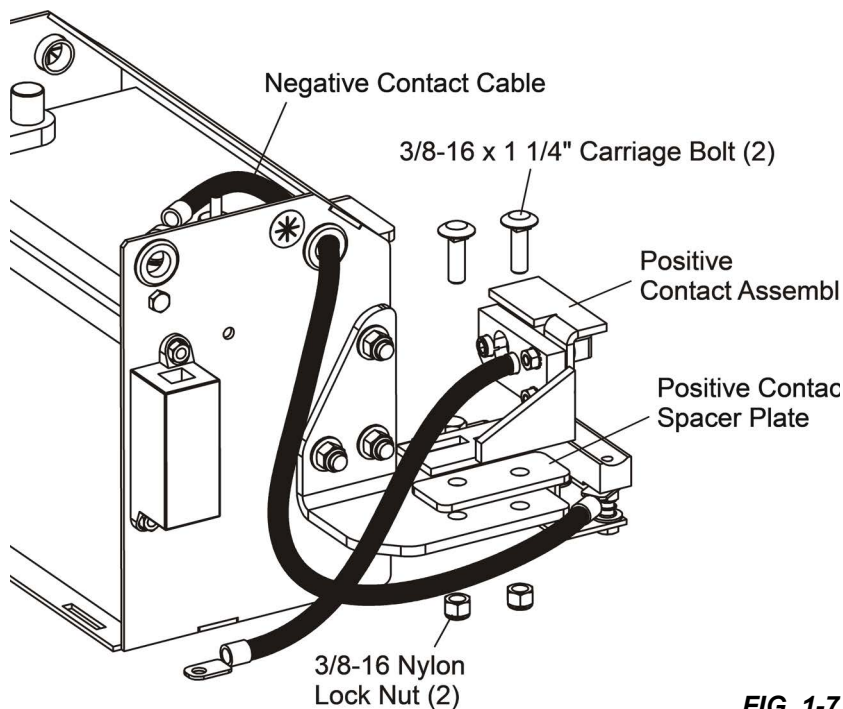


FIG. 1-7

32. Install the provided 225 amp mega fuse with the fuseholder to the battery box. Install the extra 225 amp mega fuse to the battery box cover with the longer bolts and spacers provided.

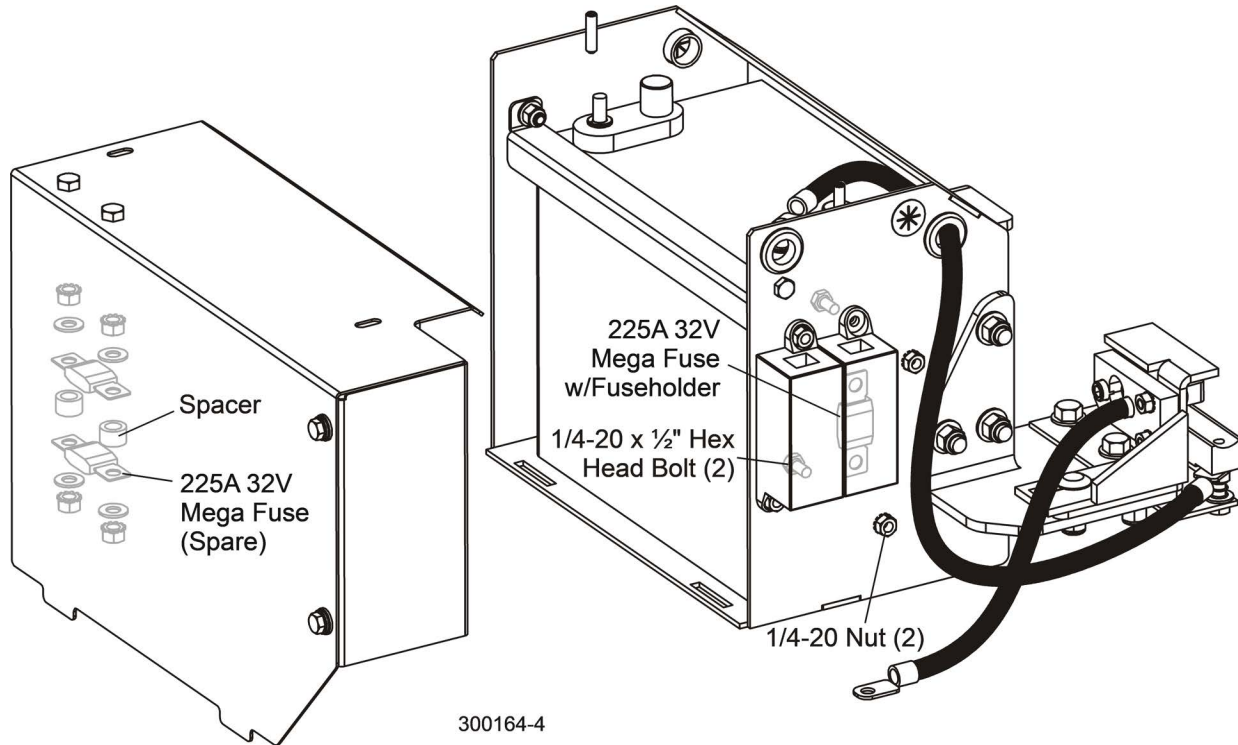


FIG. 1-8

CONNECT ALL THE EXISTING AND PROVIDED CABLES.

1. Open the fuseholder covers to access the mega fuses.
2. Remove the nuts holding the mega fuses to the fuseholders.
3. Connect the positive contact cable to the bottom terminal of the 225 amp mega fuse.
4. Disconnect the existing positive battery cable from the top terminal of the 150 amp mega fuse.
5. Install the provided red fuse jumper wire to the top terminals of the 150 amp and 225 amp mega fuses.
6. Reinstall the existing positive battery cable to the top terminal of the 225 amp mega fuse.
7. Close the fuseholder covers to secure the mega fuses.
8. Use the provided tie wraps to secure the contact cables to the existing cables.

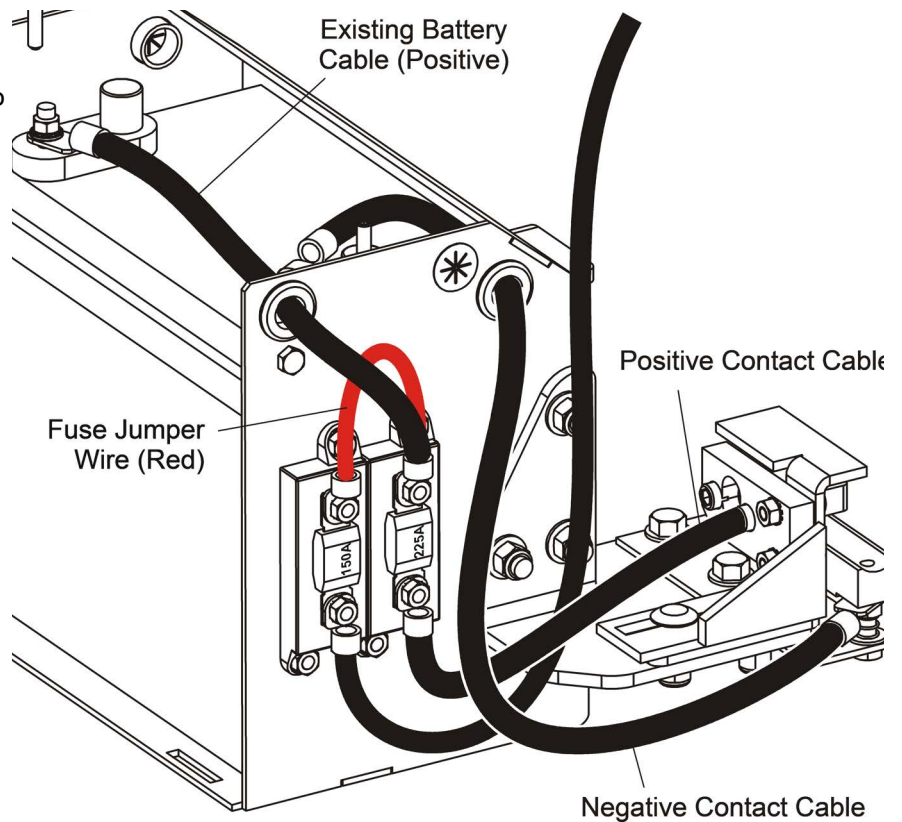
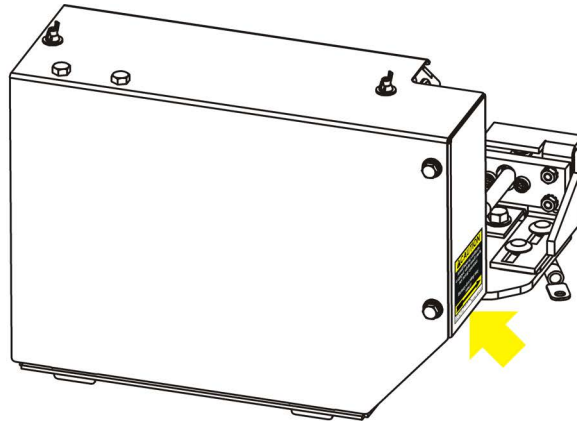


FIG. 1-9

9. Manually push the cutting head toward the front of the mill until the positive contact assembly is in position on the contact strip.
10. Using the slotted holes in the positive contact mount, slide the assembly forward until the springs are firmly compressed and solid contact is made with the strip.
11. Tighten the mounting bolts.
12. Reconnect all other wires to the battery as they were and replace the battery box and the fuse box covers.
13. Place the hydraulic contact caution decal (P12960) on the side of the fuse box housing.



300164-3

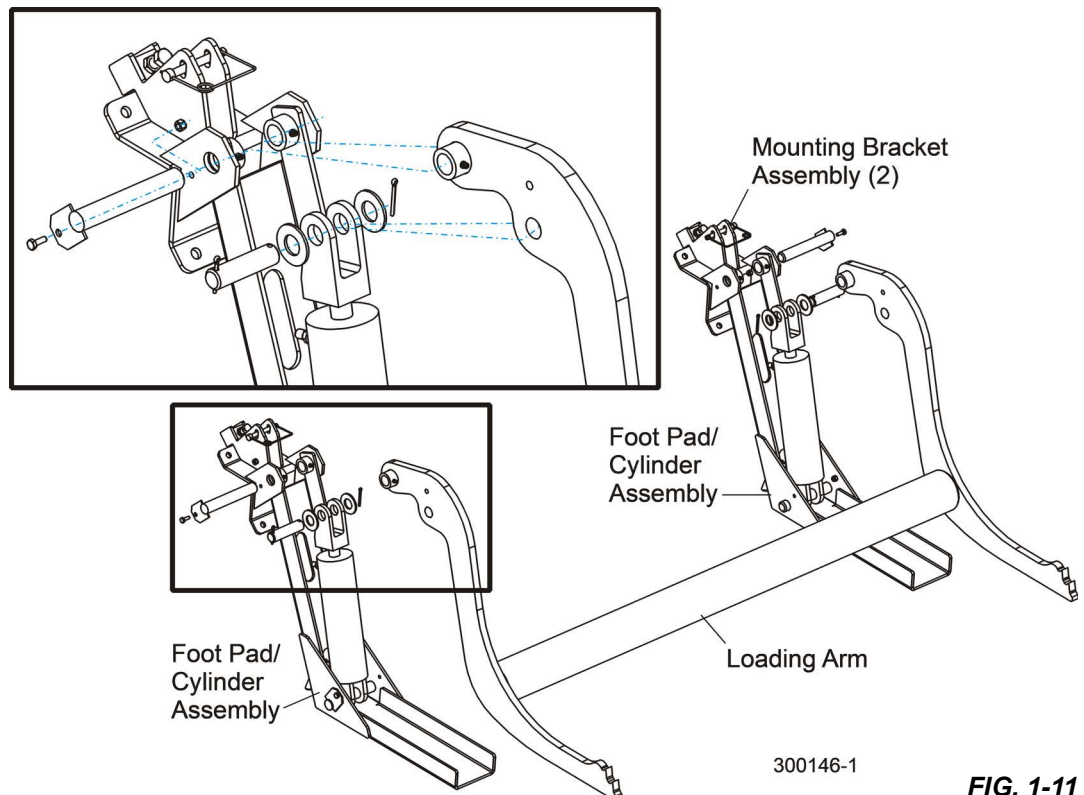
**FIG. 1-10**

14. The hydraulic control should now function whenever the positive contact is touching the contact strip.

If the pump does not operate, check all connections and grounds thoroughly.

HLA-A Hydraulic Log Loader

1. Assemble the loading arm to the two foot pad/cylinder assemblies and mounting bracket assemblies as shown.
2. Secure the top of the cylinders to the loading arm with a short pivot pin, two 1" flat washers, and cotter pins.
3. Insert a long pivot pin through each mounting bracket, foot pad then the loading arm and secure with a 1/4" bolt and lock nut.
4. Position the hydraulic loading arm assembly next to the right side of the sawmill bed.

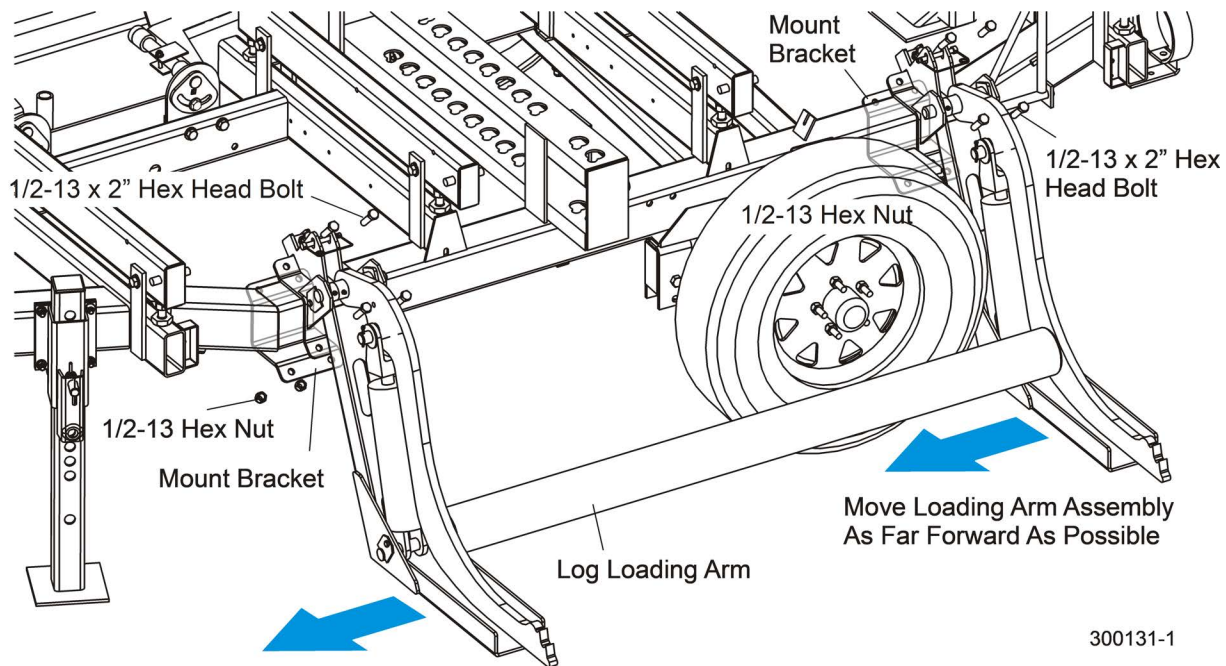


300146-1

FIG. 1-11

5. Use the two provided loading arm mount plates to install the loading arm to the sawmill bed.
6. Install the provided 1/2-13 x 2" hex head bolts and 1/2-13 hex nuts into the top holes of the mounting plates.
7. Raise the log loading arm up past the center of balance and adjust both rest bolts to meet the arm.
8. Tighten the lock nuts securing the mount plates.
9. Install the bolts and lock nuts into the bottom holes of the mounting plate and tighten.

NOTE: Move the loading arm assembly as far forward as possible before securing it to the frame tube to avoid its foot channels to interfere with the saw head when raised.



300131-1

FIG. 1-12

HYDRAULIC HOSES

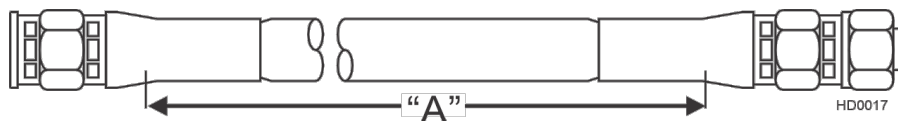
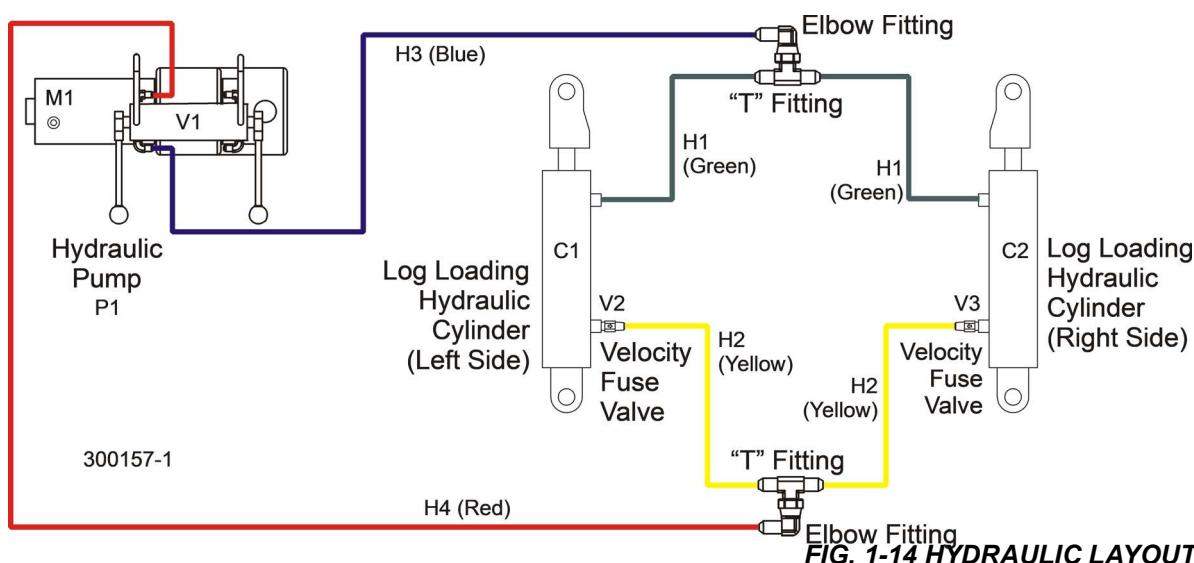


FIG. 1-13

COLOR	ID	LENGTH "A"	DESCRIPTION	PART #	QTY.
Green	H1	62"	LOADING ARM BRANCH TOP	018020	2
Yellow	H2	64"	LOADING ARM BRANCH BASE	018021	2
Blue	H3	164"	LOADING ARM TOP	P12548	1
Red	H4	164"	LOADING ARM BOTTOM	P12548	1

1. Install the two provided 62" hoses (H1) between the top fittings on the loading arm hydraulic cylinders and one of the provided 'T' fitting assemblies.



2. Install the two provided 64" hydraulic hoses (H2) between the base fittings on the loading arm hydraulic cylinders and the remaining 'T' fitting assembly.
3. Connect the two provided long hoses (H3 and H4) to each of the 'T' fitting assemblies.
4. Route the two long hoses to the side of the hydraulic box through the four hydraulic hose retaining plates located under the frame tube.
5. Route the hose underneath the pump in the hydraulic box and connect to the hydraulic pump fittings on the top of the pump (remove fitting caps if supplied).
6. Ensure that as the hoses vibrate during use, there is no chance of them coming in contact with the pump motor power terminal.



DANGER! Failure to route the hydraulic hoses as described could lead to hose wear exposing the steel braids. If the exposed braids contact the pump motor power terminal post, sparks may cause a fire or cause an electrical short.

7. Secure the hydraulic hoses to the sawmill frame.



CAUTION! Make sure there is enough slack in the hydraulic hoses attached to the loading arm cylinders. Failure to do may result in damage to the hoses and hydraulic cylinder fittings after raising the loading arm all the way up.

8. Move the hydraulic control lever up and down to eliminate air in the hoses.
9. Check the reservoir fluid level again and refill to 3/4" from the top.

10. Install the hydraulic box cover and secure with the provided bolts and washers or proceed to hydraulic log turner installation instructions.

HLT-A Hydraulic Log Turner

1. Use the previously removed side support mount pivot pins and hardware to install the provided hydraulically-operated side supports to the sawmill bed frame.
2. Install the rod ends to the ends of the side support connecting rod as shown.
3. Install a 1/2-20 hex jam nut on the rod end at the large end of the connecting rod.
4. Assemble the connecting rod to the side supports with the provided 1/2-13 x 2 1/4" hex head bolt, flat washers, and lock nuts.

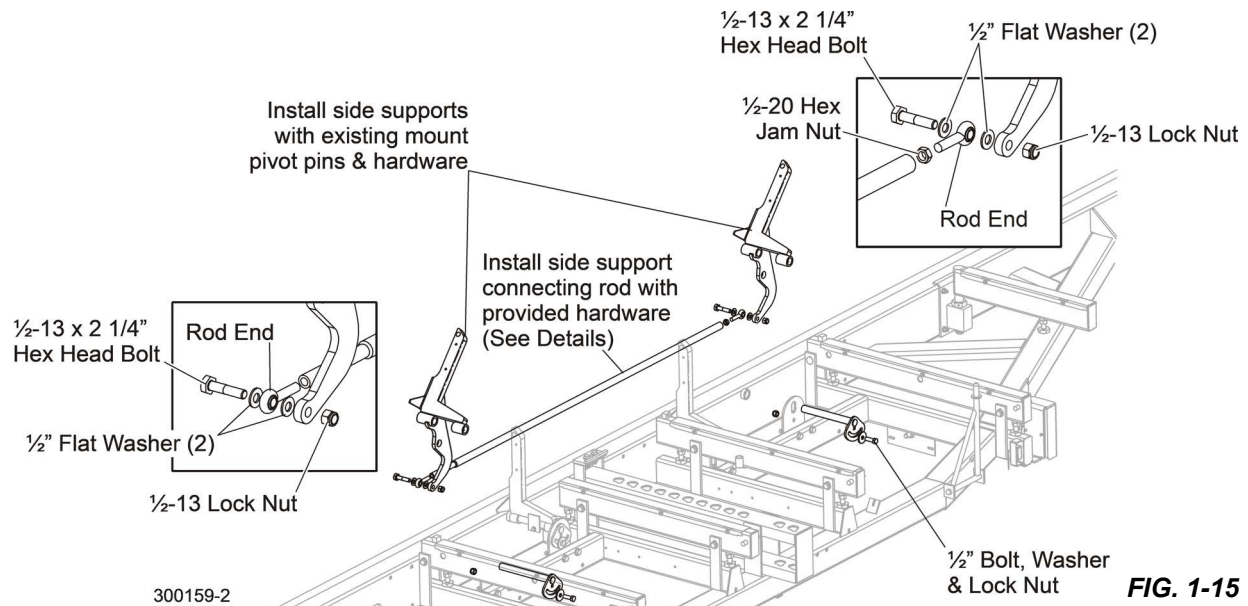


FIG. 1-15

5. Install the hydraulic turner arm assembly to the sawmill bed main tube using provided 3/8-16 x 5" carriage head bolts, 3/8-16 x 5" hex head bolts, flat washers, and lock nuts.
6. Secure the outboard end of the arm to the sawmill bed with the 1/2-13 x 5 1/2" hex head bolts, flat washers, and lock nuts.

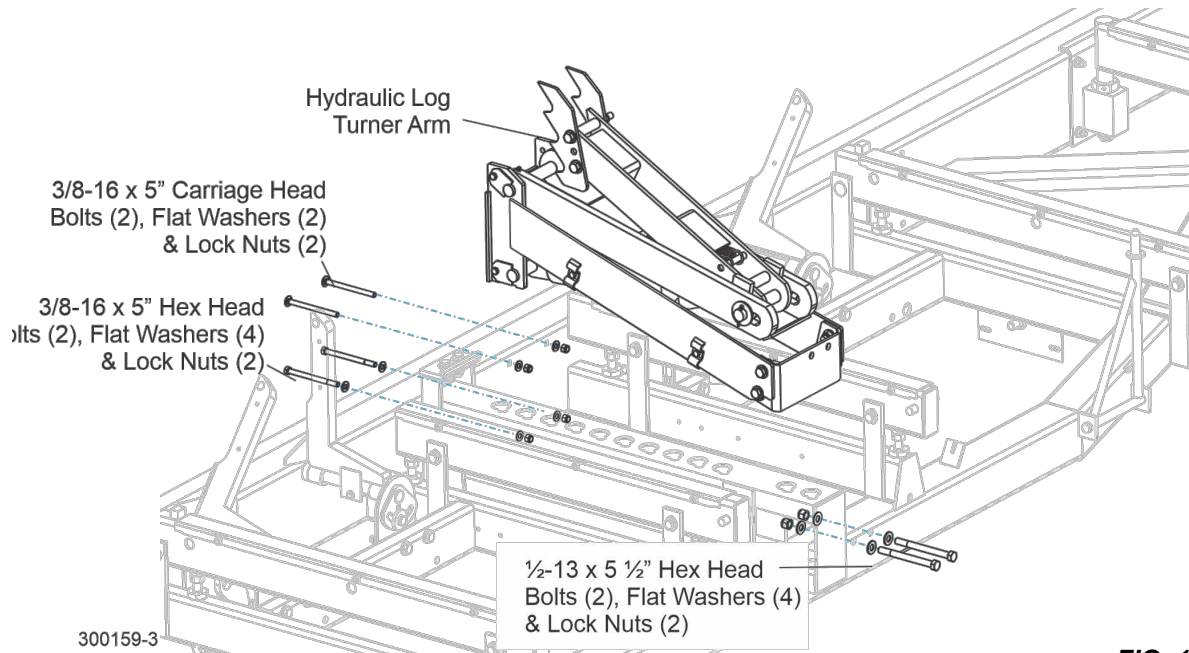
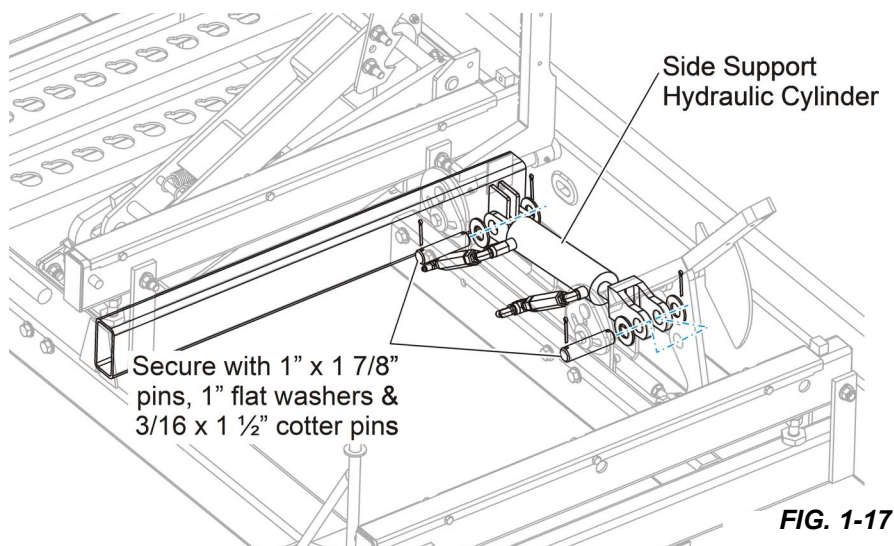


FIG. 1-16

7. Install the provided 2" x 6" hydraulic cylinder assembly to the bracket located on the back side of the bed rail to the right of the turner arm.
8. Secure with a 1" x 3 7/8" pin, two 1" flat washers, and two 3/16" x 1 1/2" cotter pins.
9. Move the rear hydraulic side support until the mounting hole aligns with the cylinder mount holes and secure with 1" x 3 7/8" pin, two 1" flat washers, and two 3/16" x 1 1/2" cotter pins.

**FIG. 1-17**

There are four hydraulic hoses included in the log turner kit.

**FIG. 1-18**

COLOR	ID	LENGTH "A"	DESCRIPTION	PART #	QTY.
Plain	H5	27"	LOG TURNER BASE	P12535	1
Orange	H6	18"	LOG TURNER TOP	015704	1
Plain	H7	220"	SIDE SUPPORT TOP		1
Pink	H8	226"	SIDE SUPPORT BASE		1

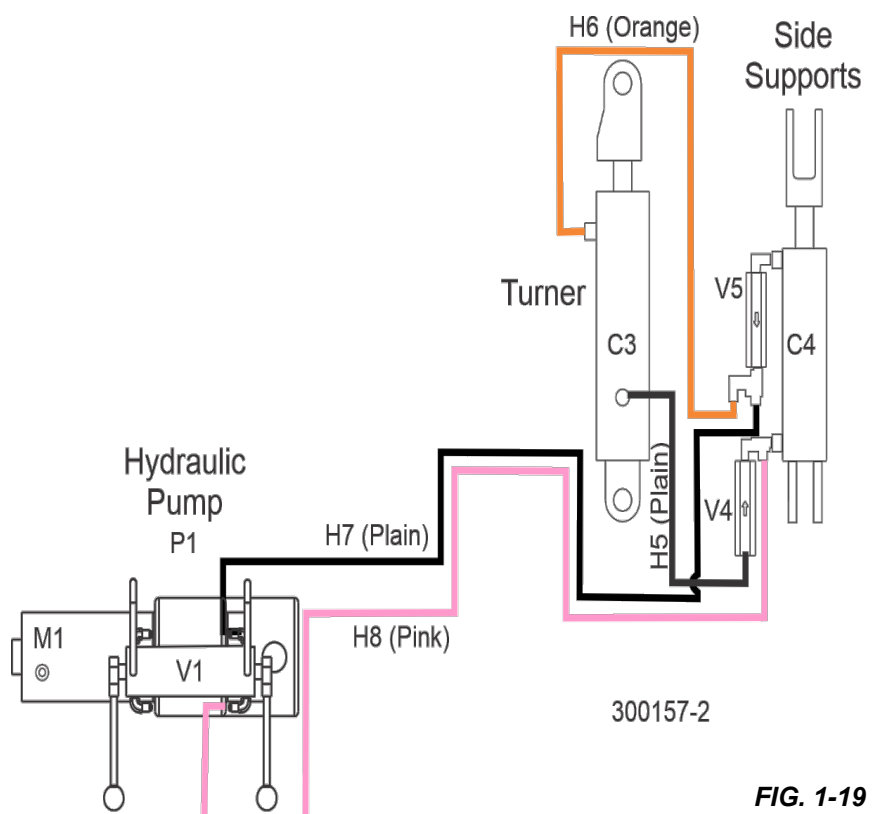
10. Install the 27" hose (H5) between the bottom side support sequence valve and the fitting at the bottom log turner cylinder.

The hydraulic layout diagram is shown in FIG. 1-19.

11. Install the 18" hose (H6) between the top side support sequence valve and the fitting at the top of the log turner cylinder.
12. Connect the two provided long hoses (H7 and H8) to each of the remaining side support sequence valve fittings.
13. Route the two long hoses to the side of the hydraulic box through the four hydraulic hose retaining plates located along the turner arm.
14. Route the hose in the hydraulic box underneath the pump and connect to the hydraulic pump fittings on the top of the pump (remove fitting caps if supplied).
15. Be sure that as the hoses vibrate during use, there is no chance of them coming in contact with the pump motor power terminal.



DANGER! Failure to route the hydraulic hoses as described could lead to hose wear exposing the steel

**FIG. 1-19**

braids. If the exposed braids contact the pump motor power terminal post, sparks may cause a fire or cause an electrical short.

- 16.** Secure the long hydraulic hoses to the sawmill bed frame with the 6" tie wraps provided.
- 17.** Move the hydraulic control lever up and down to eliminate air in the hoses.
- 18.** Check the reservoir fluid level again and refill to 3/4" from the top, if necessary. Install the hydraulic box cover and secure with the provided bolts and washers.
- 19.** Place the provided caution decal (P11809) to the trailer hitch tube.

SECTION 2 OPERATION

2.1 Hydraulic Log Loader/Turner

The hydraulic control lever(s) become operational when the contacts at the bottom of the carriage touch the power strip on the frame tube. The hydraulic control lever will only work when the cutting head is close enough to the front end of the mill to touch the power strip.

NOTE: For Mills built prior to 02/2005: Before moving the saw carriage, the hydraulic log loader must first be lowered to the ground to avoid conflict with the saw head. The saw head rest pin was relocated on sawmills after these revisions to allow the saw head to clear the hydraulic loader in the travel position.

HLA prior to 07/2010: The hydraulic loader allows the operator to load logs onto the sawmill by operating a control lever..

HLA - 07/2010 and later with dual-function hydraulic control: The dual-function hydraulic control allows the operator to load and turn logs on the sawmill by operating the control levers

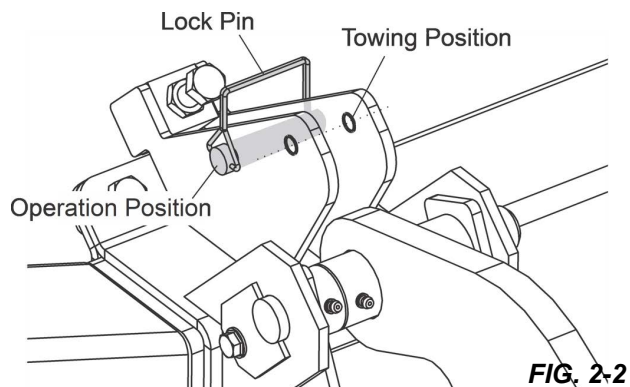
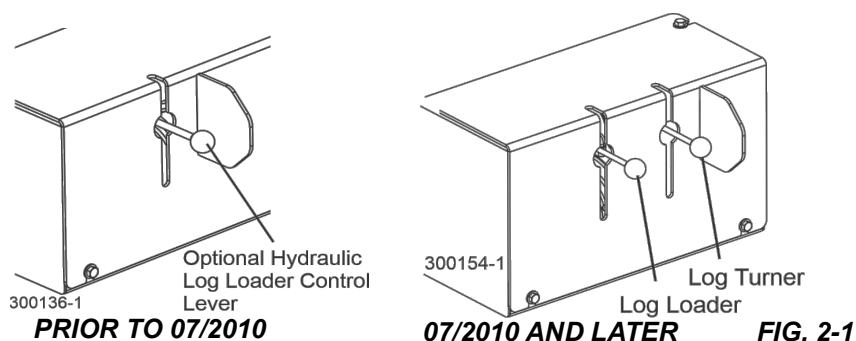


DANGER! Keep all persons out of the path of moving equipment and logs when operating sawmill or loading and turning logs. Failure to do so will result in serious injury.



CAUTION! Always make sure the engine is running before operating the hydraulic controls to avoid draining the battery. Holding the hydraulic switches halfway up or down also will cause excessive battery usage.

1. Remove the clamp from the sawmill bed so it will not get in the way of logs being loaded onto the bed.
2. Remove the two retaining pins holding the log loader in the towing position. **See Fig. 2-2.**
3. If the sawmill is equipped with the hydraulic log turner, remove the travel plate. **See Fig. 2-3.**
4. Lift the turner arm and pull the plate from underneath the turner arm elbow.



5. Lower the turner lever to completely lower the turner arm.

Notice that after the turner arm is all the way down, the side support braces will begin to lower.

6. Release the turner lever after the turner arm is lowered, but before the side supports begin to lower.

This stops the log being loaded from damaging the turner and/or falling off the side of the sawmill.

When raising the turner lever, the side supports rise first. **After reaching a fully vertical position**, the turner arm will engage and start to rise.

7. Manually lower the log loader so it rests on the ground.



CAUTION! Do not drop the loader onto the ground or perform any action which might break the valves on the loader cylinders.

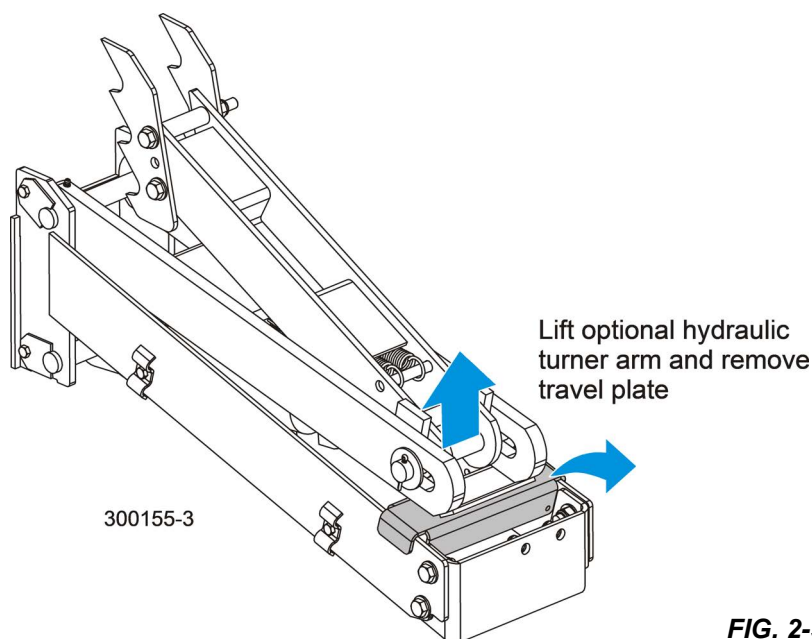


FIG. 2-3

8. Place the retaining pins in the operation position holes. **See Fig. 2-2.**
9. The front and rear toe boards should be below bed level.
10. Lift front or rear end of the log with the toe boards to situate the center of the log to the path of the blade.

TO LOAD LOGS

1. Move the saw carriage to the front end of the frame.



CAUTION! Before loading a log, be sure the cutting head is moved far enough forward so the log does not hit it.

CAUTION! Be sure the log clamp, pivot rails, turning arm and toe boards are adjusted out of the path of the log before loading a log onto the bed.

NOTE: The log turner will operate much easier if the log is centered on the sawmill bed.

2. Raise the side supports on the sawmill bed to prevent the log from falling off the side of the bed.
3. Roll the log onto the loader so that it is approximately centered with the sawmill bed.



DANGER! Keep all persons out of the path of moving equipment and logs when operating sawmill or loading and turning logs. Failure to do so will result in serious injury.

4. Raise the loader lever to raise the log onto the sawmill bed until the log rolls onto the mill bed.
5. Lower the loading arm about halfway while squaring the log to prevent the log from rolling off the side of the mill.



WARNING! Always leave loading arm halfway up while log is on sawmill bed. Failure to do so may result in serious injury or death.

WARNING! The hydraulic log loader is operational whenever the saw carriage and contact strip are engaged, even with the key switch off. To avoid unintentional use of the loader, do not leave the sawmill unattended with the hydraulic power contacts engaged. Doing so may result in serious injury or death.

NOTE: Logs also may be loaded onto the mill with a tractor or other equipment specifically designed for that purpose.



WARNING! PRIOR TO 07/2010 ONLY: The hydraulic log loader is operational whenever the saw carriage and contact strip are engaged, even with the keyswitch off. To avoid unintentional use of the loader, do not leave the sawmill unattended with the hydraulic power contacts engaged. Doing so may result in serious injury or death.

TO TURN LOGS

1. Raise the turner lever to engage the log turner arm.
2. Let the arm rise until it touches the log and starts to turn it.
3. Spin the log against the side supports until it is turned the way you want it for the first cut.
4. To turn the log more, clamp the log against the side supports and lower the turner arm below the log.
5. Raise the turner arm to get a new bite on the log.
6. Disengage the clamp and continue turning the log.
7. Repeat steps 4 through 6 until the log is turned as desired.

2.2 Preparing the Sawmill for Towing

To get your sawmill ready for towing after the log loading arm kit is installed, refer to *Preparing the Sawmill for Towing Section* in Owner's Manual.

1. Move the saw carriage to the front end of the sawmill to make sure that the positive contact assembly contacts the contact power strip to make the hydraulic system operational.
2. Use the hydraulic control to raise the turner arm (if equipped) as high as it will go.
3. Lift the turner arm up and place the travel plate under the turner to secure the arm above the sawmill bed.
See Fig. 2-3.



CAUTION! Move the hydraulic turner up to provide maximum ground clearance before towing. Failure to do so may result in damage to the sawmill.

4. Remove the loading arm lock pins from the operation position holes.
5. Use the hydraulic control to raise the log loading arm as high as it will go.



CAUTION! Make sure there is enough slack in the hydraulic hoses attached to the loading arm cylinders. Failure to do may result in damage to the hoses and hydraulic cylinder fittings after raising the loading arm all the way up.

6. Manually lift the loading arm to its towing position.
7. Place the lock pin in the towing position holes to secure the loading arm during transportation.
8. Push the loader lever down to bring the loading arm channels up to the loader.

See Owner's Manual to complete the towing preparation procedure.

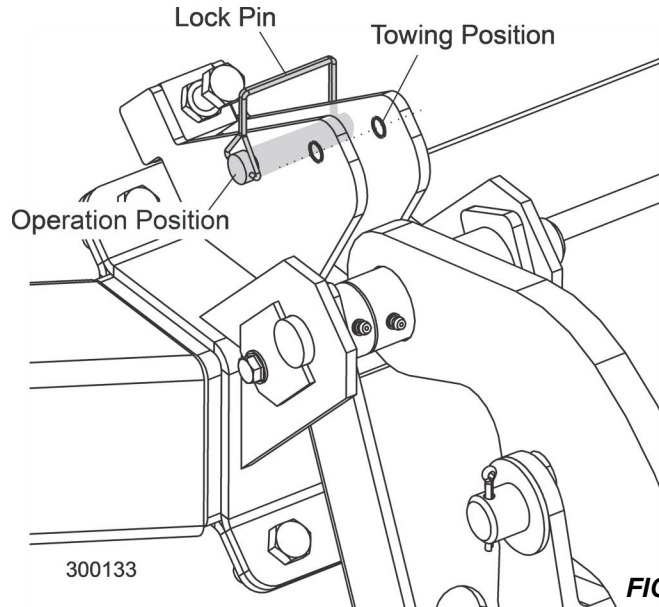


FIG. 2-4

SECTION 2 MAINTENANCE

9. Hydraulic System



WARNING! Disconnect and lockout power before performing any service to the electrical system. For battery-powered equipment, disconnect the negative battery terminal cable. Failure to do so may result in injury and/or electrical system damage.

1. Check the hydraulic fluid level **every fifty hours** of operation.

NOTE: The level in the hydraulic pump should be 3/4" (19mm) from the top with **all cylinders collapsed**.

2. Add fluid as necessary.

If humidity is a problem or the mill is used outside in humid weather, drain and replace two quarts (.95 liters) of fluid **every six months**. This will drain any accumulated water and help prevent pump failure due to water ingestion. It also will prevent excessive fluid wear and allow the fluid to maintain its hot end performance. If humidity is not a problem, drain and replace one gallon (3.8 liters) of fluid **every year** to prevent fluid wear.

If you are operating in temperatures -20° to 100° F (-29° to 38° C), use an all-weather hydraulic fluid such as Exxon Univis HVI 26. **For alternate fluids and/or other temperature ranges, refer to the chart below.** Operating above the recommended temperature range of a fluid could result in excessive pump wear. Operating below the recommended temperature range could result in reduced hydraulic cylinder speed. To change fluid types, replace one gallon of the current fluid with one gallon of the alternate fluid.

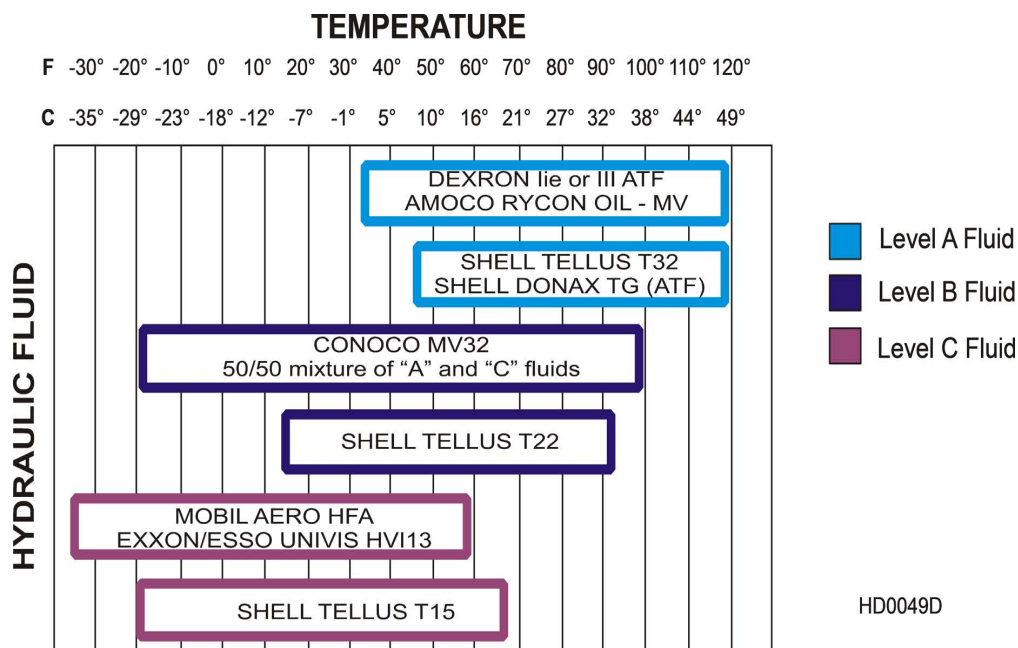


FIG. 2-1

3. Inspect the hydraulic pump motor brushes **every 750 hours** of operation; remove brush dust and replace the brushes if they worn to a length of 1/4" or shorter.



CAUTION! Do not operate the hydraulic system if the pump motor brushes are worn shorter than 1/4". Damage to the pump motor may result.

4. Periodically check all hydraulic lines and fitting as needed; replace as necessary.
5. Lubricate the log turner (if equipped) with a NLGI No. 2 grade lithium grease **every fifty hours** of operation.
6. Lubricate the turner pivot pins with WD-40 or a dry lube **every fifty hours** of operation.
7. Grease the loading arm with a NLGI No. 2 grade lithium grease **every fifty hours** of operation.

2.1 Troubleshooting



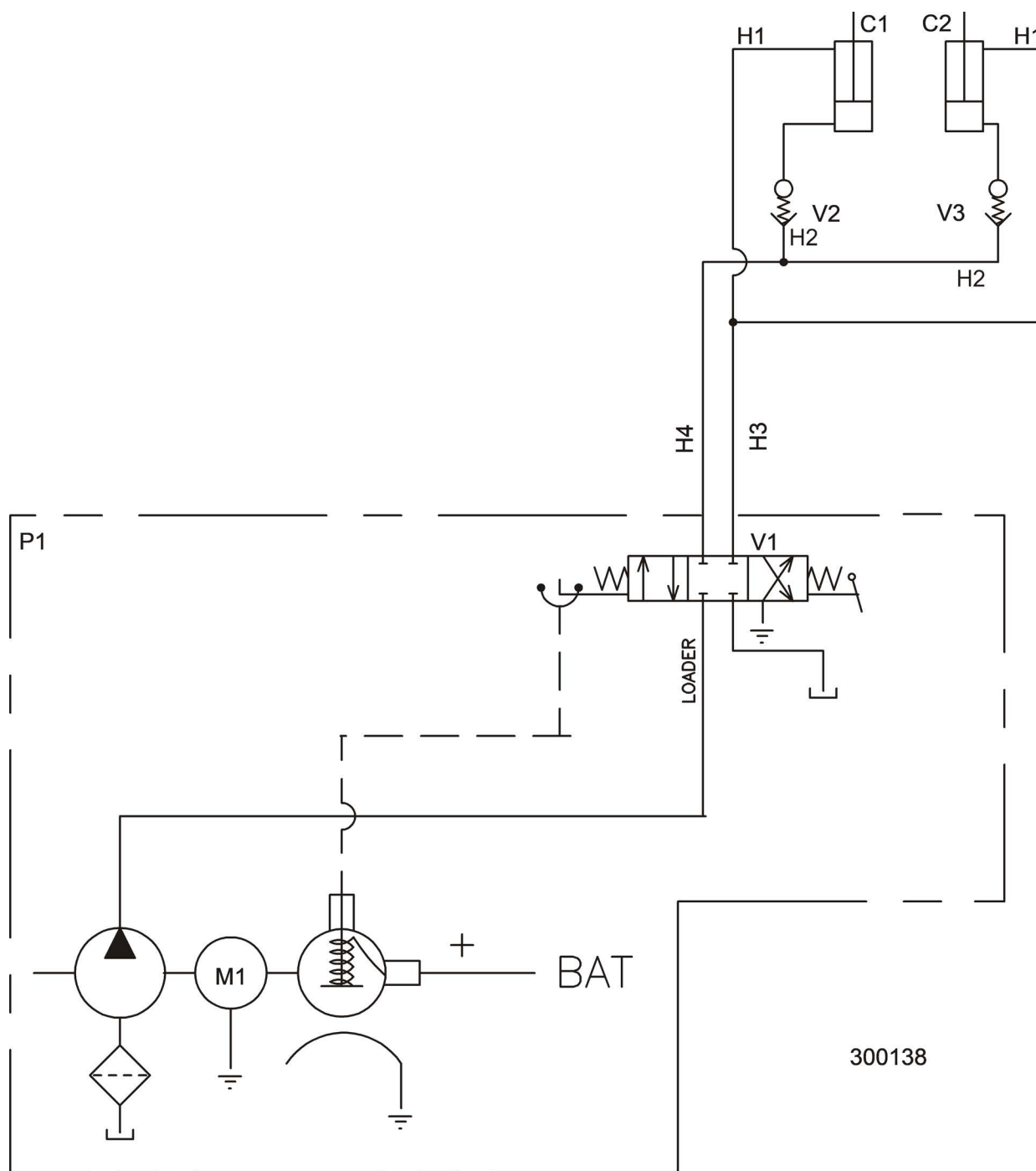
WARNING! Disconnect and lockout power before performing any service to the electrical system. For battery-powered equipment, disconnect the negative battery terminal cable. Failure to do so may result in injury and/or electrical system damage.



WARNING! Before performing service near moving parts such as blades, pulleys, motors, belts and chains, first turn the key switch to the OFF (#0) position and remove the key. If the key is turned on and moving parts activated, serious injury may result.

PROBLEM	CAUSE	SOLUTION
You Can Actuate Any Hydraulic Handle, But Get No Response From The Pump.	Carriage not positioned properly to provide power to the pump	Make sure carriage contact bracket is adjusted far enough forward for battery positive contact to touch 6ft. strip on main tube. Check contact and strip for tarnish or loose wires. Clean as necessary
	Poor ground connection	Check ground connection between pump and saw frame and between battery negative contact and lower rail. Check contact and rail for tarnish or loose wires. Clean as necessary
	Blown fuse	Replace
	Low or dead battery	Test battery amperage capability (such as low battery charge, low alternator output, defective voltage regulator, bad battery cell, battery age deterioration, etc.). Replace or recharge as necessary
	Poor cable connection	Check cable connection and make sure that battery terminals are in good condition (not corroded)
	Defective solenoid (may be indicated by solenoid clicking) See Monarch manual for troubleshooting solenoid	After checking all other possibilities for low voltage to solenoid, check solenoid. Tapping on solenoid may fix temporarily. Replace solenoid if necessary. NOTE: The solenoid is not a standard automotive type. Order from Wood-Mizer only
	Defective pump motor	Remove motor from pump and inspect. Repair or replace as necessary
No Response From The Pump By Actuating Handle	Electric contact spring inside of non-working valve corroded, broken, or dislocated	Check contact spring. Relocate or replace as necessary
	Set screw holding handle to valve shaft is loose	Tighten set screw so that valve shaft turns when handle is actuated
Pump Motor Runs With Little Or No Response From The Cylinders	Low battery	Test battery. Recharge or replace as necessary
	Low fluid level	Check fluid level. Add an all-season hydraulic fluid such as Amoco Rycon Oil MV or Mobil Multipurpose ATF (automatic transmission fluid) until level is 4 - 4 1/2" from bottom of reservoir with all cylinders retracted

PROBLEM	CAUSE	SOLUTION
	Pressure relief valve moved from proper setting	Adjust pressure relief valve.
	Low air temperature causing fluid to thicken	Allow fluid to warm up. Synthetic fluids are available that allow for hydraulic operation in cold weather conditions (Univis HVI 13)
Pump Motor Runs Continuously When Power Contact Is Made	Solenoid is stuck closed	Tapping the solenoid may solve this problem temporarily. Replace solenoid
	Valve handle spring is deformed or broken, causing the handle to not return to the neutral position	Replace handle spring
	Contact spring is dislocated and lying across contacts	Replace contact spring
Fluid Leaks From Around Cylinder Piston Ram	Worn seals	Replace seals in cylinder. Check piston ram for abrasive weld that may be causing premature seal failure
Fluid Leak Around Pump Box	Loose seal or fitting	Wipe pump off completely to locate cause of leak. You may have to unbolt the pump to wipe behind it. NOTE: Movement of the sawmill can cause fluid to slosh up into the foam filter in the reservoir cap, and subsequently spray out, giving the appearance that fluid is leaking from the pump
Pump runs but makes “growling” sound and hydraulic functions are slow, jerky or don’t work at all.	Low fluid level	Check fluid level and add fluid as necessary. Check for leaks in the system at the control box fittings, hoses and cylinders
One of the log loader cylinders does not move when lowering the loader causing the foot of other to raise completely before loader will start down.	Damaged cylinder shaft	Replace the cylinder that is not moving



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FIG. 3-2 HYDRAULIC LOG LOADER (HLA REV. A1.00 - A2.03)

3.2 Hydraulic Layout Diagram

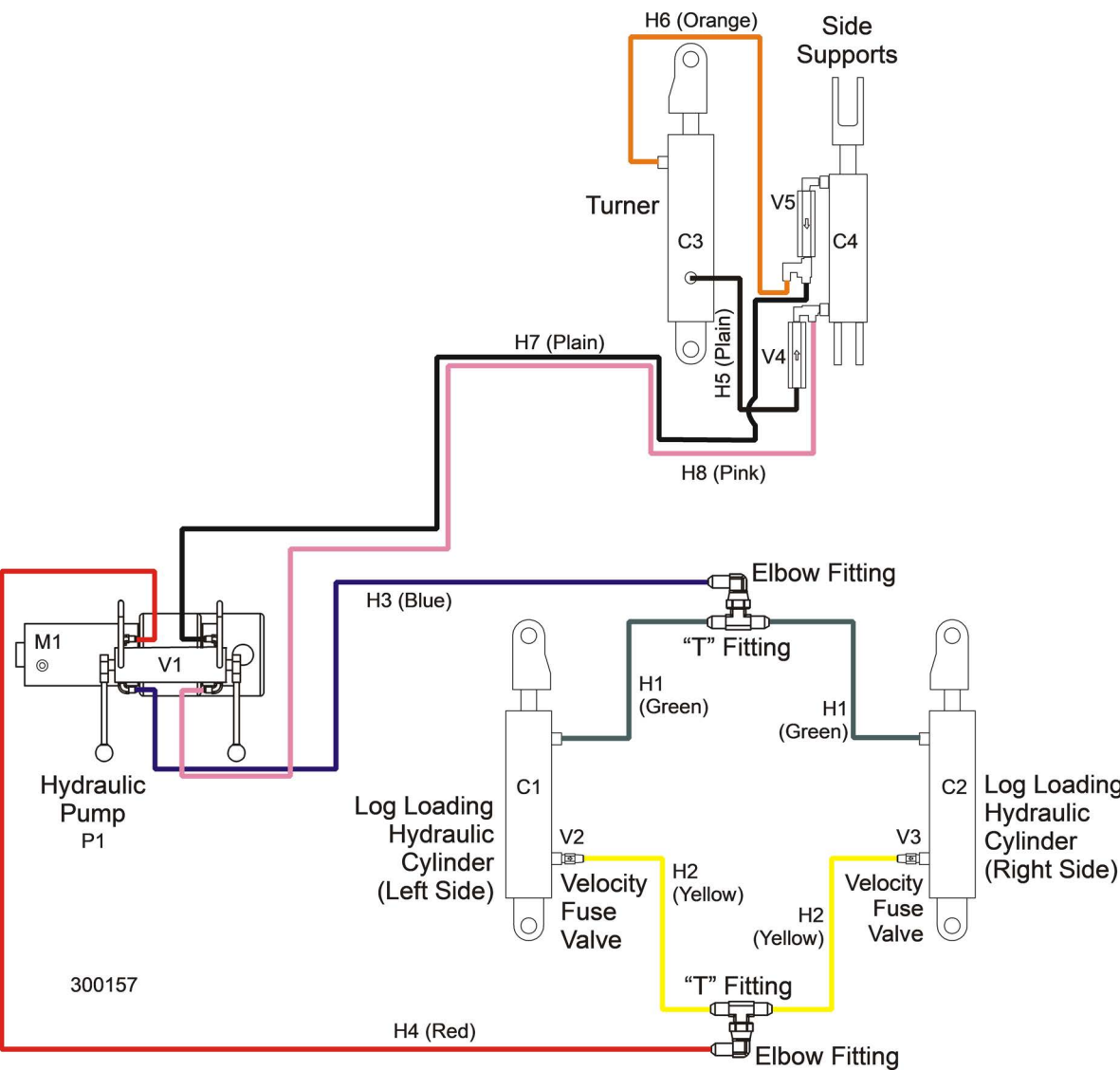


FIG. 3-3 HYDRAULIC LOADER/TURNER LAYOUT DIAGRAM

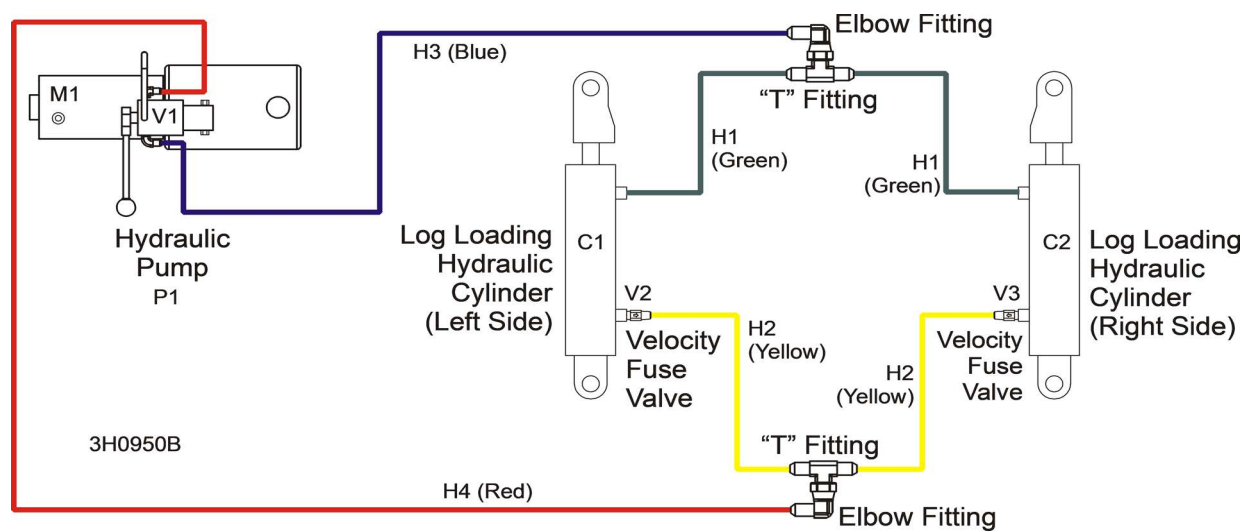


FIG. 3-4 HYDRAULIC LOADER LAYOUT DIAGRAM (HLA REV. A1.00 - A2.03)

3.3 Hydraulic Components

ID	Mfg. Part No.	Manufacturer	Wood-Mizer Part.#	Description
C1, C2	P12847	J-D Hydraulic	P12847	Hyd. Cylinder, 3" Bore X 8" Stroke
C3	P12846	J-D Hydraulic	P12846	Hyd. Cylinder, 2 1/2" Bore X 8" Stroke
C4	P12845	J-D Hydraulic	P12845	Hyd. Cylinder, 2" Bore X 6" Stroke
M1	08058-I	Monarch Hyd.	052807	Motor, Iksra Hydraulic Pump
P1	M-500 4W/4W	Monarch Hyd.	025713	Hydraulic Pump, With Motor (HCA)
	M-310	Monarch Hyd.	048386	Hydraulic Pump, With Motor (HLA Rev. A1.00 - A2.03)
V1	19760	Monarch Hyd.		Valve, 4-Way Hydraulic (HCA)
	00524	Monarch Hyd.	P10143	Valve, 4-Way Hydraulic (HLA Rev. A1.00 - A2.03)
V2, V3	28000-502-5	Vonberg	015750	Valve, Hydraulic 5GPM Velocity Fuse

TABLE 3-1

3.4 Hydraulic Hoses

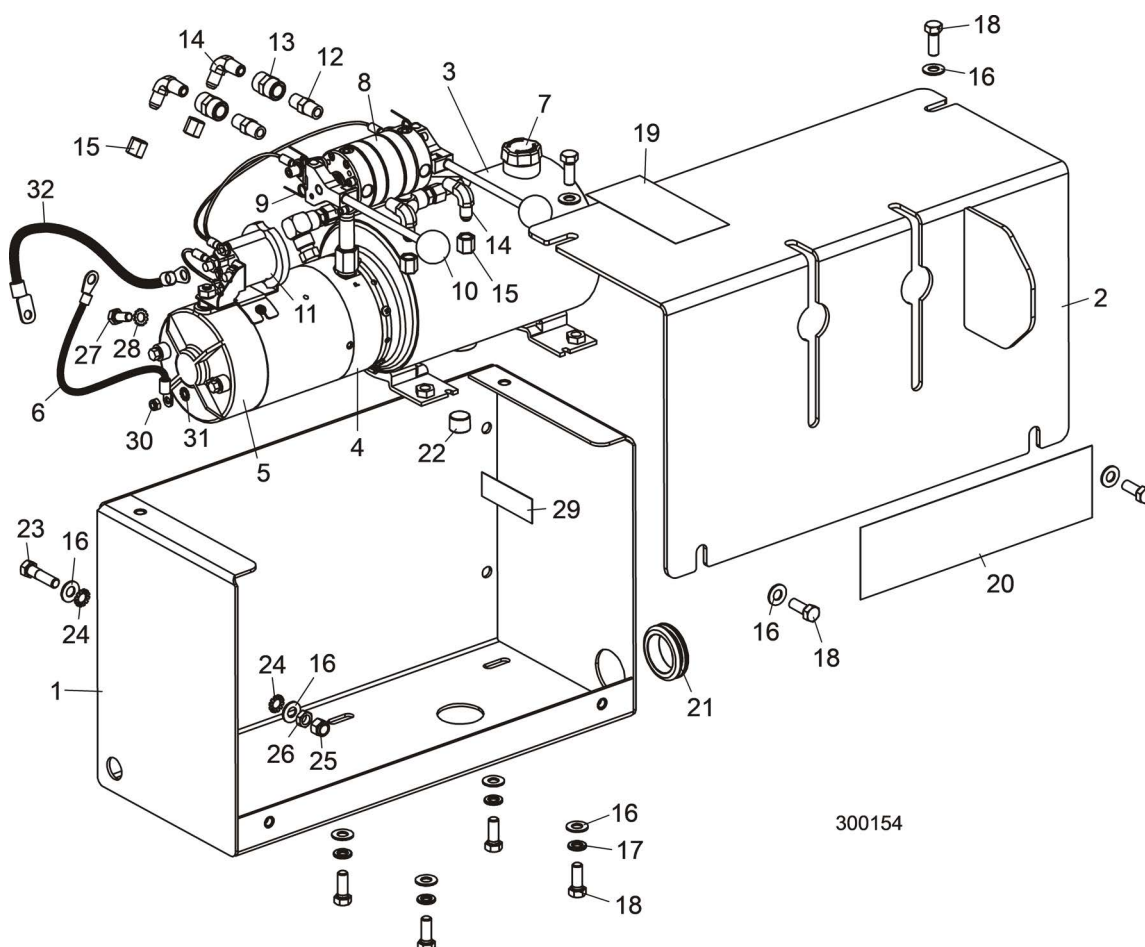
ID	Color Code	LENGTH "A"	Application	Wood-Mizer Part No.
H1	Green	62"	1/4" Loading Arm Branch Top	079000-62
H2	Yellow	64"	1/4" Loading Arm Branch Base	079000-64
H3	Blue	148" ¹	1/4" Loading Arm Top	079000-148
H4	Red	158" ¹	1/4" Loading Arm Bottom	079000-158
H5	Plain	27"	1/4" Log Turner Base	079000-27
H6	Orange	18"	1/4" Log Turner Top	079000-18
H7	Plain	220"	1/4" Side Support Top	079000-220
H8	Pink	206"	1/4" Side Support Base	079000-206

TABLE 3-2

¹ Length changed from 164" HLA Rev. A3.00

SECTION 4 REPLACEMENT PARTS

4.1 Control Box



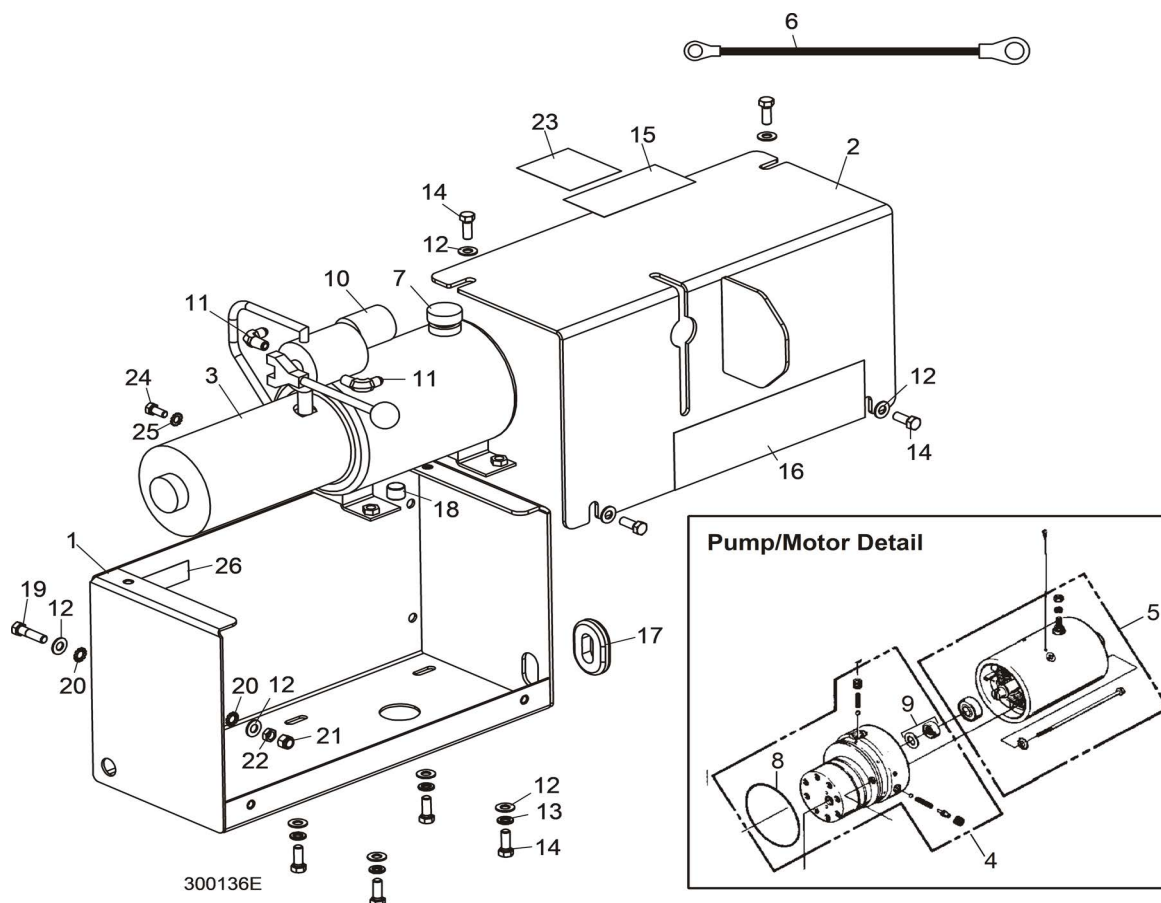
REF	PART #	DESCRIPTION	COMMENTS	QTY.
	025717	BOX ASSEMBLY, HYDRAULIC DUAL FUNCTION CONTROL		1
1	025716	Box Weldment, Hydraulic Dual Function Control		1
2	025714	Cover Weldment, Hydraulic Dual Function Control		1
3	025713	Pump/Valve Assembly, Hydraulic Dual Function #M-500 4W/4W		1
4	061110	Pump, Hydraulic Replacement Monarch Model #12171-250		1
	052807	Motor Kit, Hydraulic Replacement		1
5	038683	Motor, 12 VDC Hydraulic Pump #08714 (Iskra)	Available in assemblies only.	1
	038682	Brush Kit, 4-Valve Hydraulic Pump Motor #08658-I (Iskra)		1
	P12513	Bearing, Base Motor #02318		1
6	052806	Wire Assembly, Motor Brush Ground		1
7	P09596	Cap, Hydraulic Pump Vented Fill #01143		1
8	061111	Valve Assembly, 4-Way Monarch #19760		2
9	025818	Spring, Hydraulic Pump Valve Contact #00015		4

REF	PART #	DESCRIPTION	COMMENTS	QTY.
10	P09594	Handle Assembly, Hydraulic Pump Valve #00172		2
	P09753	Spring, Hydraulic Pump Valve Handle #00018		2
11	061112	Solenoid, 12 VDC Motor Starter #17744		1
12	P05389	Fitting, 1/4" NPT Hex Nipple		2
13	P03420	Fitting, 1/4" NPT Coupling		2
14	P09142	Fitting, 1/4" NPT x 1/4" JIC Male Elbow		4
15	016815	Fitting, 1/4" JIC Cap		4
16	F05011-3	Washer, 3/8" SAE Flat		10
17	F05011-4	Washer, 3/8" Split Lock		4
18	F05007-87	Bolt, 3/8-16 X 1" Hex Head Grade 5		8
19	P12961	Decal, Keep Away Hydraulic Warning		1
20	036720	Decal, Hydraulic Logo		1
21	043405	Grommet, 1 1/2" x 3/16"		1
22	P26258	Fitting, 1/2" NPT Plug		1
23	F05007-78	Bolt, 3/8-16 x 1 1/2" Hex Head Grade 5		1
24	F05011-36	Washer, 3/8" External Star Lock		2
25	F05010-10	Nut, 3/8-16 Hex Nylon Lock		1
26	F05010-29	Nut, 3/8-16 Hex Jam		1
27	F05006-5	Bolt, 5/16-18 x 3/4" Hex Head		1
28	F05011-33	Washer, 5/16" External Star Lock		1
29	S12825	Decal, Hydraulic Fluid		1
30	F05010-200	Nut, M6-1.0 Hex Nylon Lock		1
31	F05011-37	Washer, 1/4" Exterior Star Lock		1
32		Cable Assembly, 10" Pump To Solenoid		1
	P12742	FLUID, 1-QUART DEXRON III HYDRAULIC		4
	006397	FLUID, 1-GALLON CONOCO MV32		1
	P12822	FLUID, 1-GALLON EXXON UNIVIS HVI 13 HYDRAULIC		1

4.2 Control Box

HLA/HLA-A

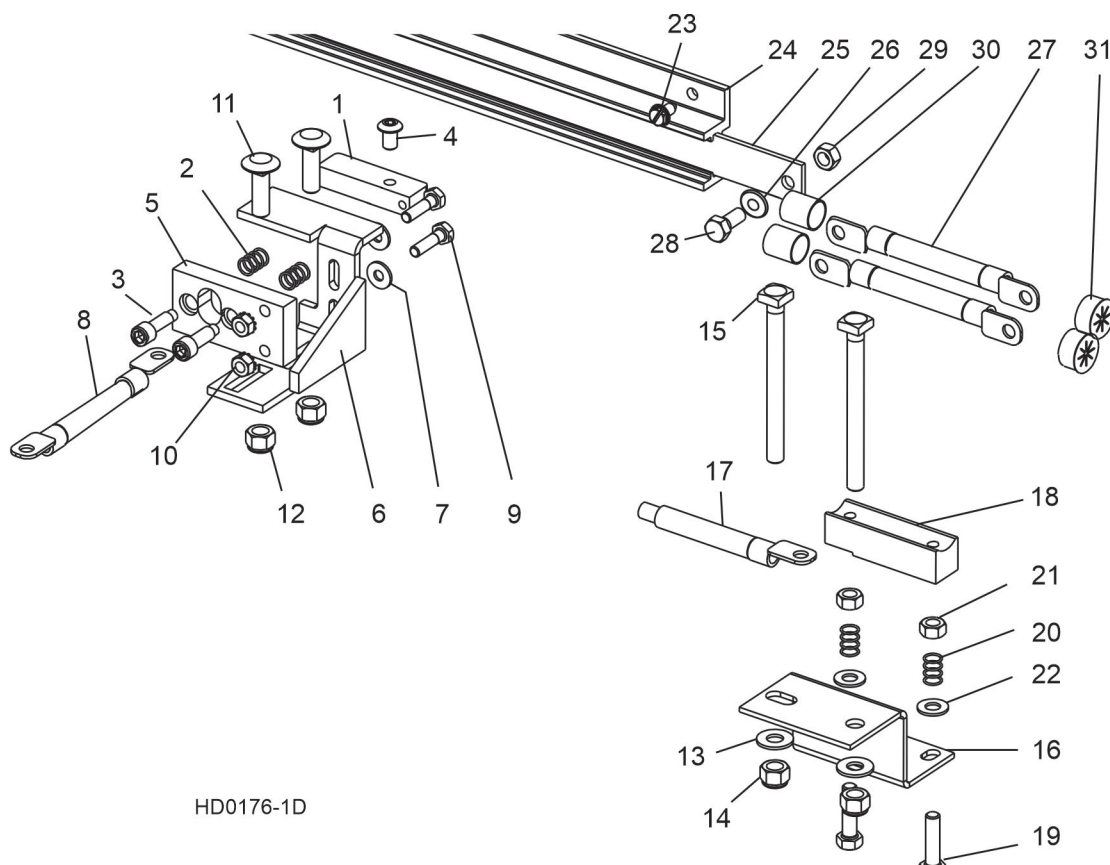
Rev. A1.00 - A2.03



REF	PART #	DESCRIPTION	COMMENTS	QTY.
	048380	BOX ASSEMBLY, HYDRAULIC LOG LOADER CONTROL	Prior to 2010, the control box was part of HLA Kits	1
1	048381	Box Weldment, Hydraulic Loader Control		1
2	048387	Cover Weldment, Hydraulic Loader Control		1
3	048386	Pump Assembly, Hydraulic Loader w/Motor #M-310		1
4	016199	Pump, Hydraulic Replacement Monarch Model #12070		1
	052807	Motor Kit, Hydraulic Replacement		1
5	038683	Motor, 12 VDC Hydraulic Pump #08714 (Iskra)	Available in assemblies only.	1
	038682	Brush Kit, 4-Valve Hydraulic Pump Motor #08658-I (Iskra)		1
	P12513	Bearing, Base Motor #02318		1
6	052806	Wire Assembly, Motor Brush Ground		1
7	P12817	Cap, Hydraulic Pump Vented Fill #03171		1
8	P10198	O-Ring, Hydraulic Pump/Reservoir #02352		1
9	P10315	Seal, Hydraulic Pump/Motor #02330		1
10	074054	Switch, Single Valve Hydraulic Unit Start		1
	P09594	Handle Assembly, Hydraulic Pump Valve #00172		1

REF	PART #	DESCRIPTION	COMMENTS	QTY.
	P09753	Spring, Hydraulic Pump Valve Handle #00018		1
11	P09142	Fitting, 1/4" NPT x 1/4" JIC Male Elbow		2
12	F05011-3	Washer, 3/8" SAE Flat		10
13	F05011-4	Washer, 3/8" Split Lock		4
14	F05007-87	Bolt, 3/8-16 X 1" Hex Head Grade 5		8
15	P12961	Decal, Keep Away Hydraulic Warning		1
16	036720	Decal, Hydraulic Logo		1
17	085613	Grommet, 1" x 1 3/4" Oval Rubber		1
18	P26258	Fitting, 1/2" NPT Plug		1
19	F05007-78	Bolt, 3/8-16 x 1 1/2" Hex Head Grade 5		1
20	F05011-36	Washer, 3/8" External Star Lock		2
21	F05010-10	Nut, 3/8-16 Hex Nylon Lock		1
22	F05010-29	Nut, 3/8-16 Hex Jam		1
23	052213	Decal, Hydraulic Loader Warning		1
24	F05006-5	Bolt, 5/16-18 x 3/4" Hex Head		1
25	F05011-33	Washer, 5/16" External Star Lock		1
26	S12825	Decal, Hydraulic Fluid		1
	P12742	FLUID, 1-QUART DEXRON III HYDRAULIC		2 1/4 gal.
	006397	FLUID, 1-GALLON CONOCO MV32		2 1/4 gal.
	P12822	FLUID, 1-GALLON EXXON UNIVIS HVI 13 HYDRAULIC		2 1/4 gal.

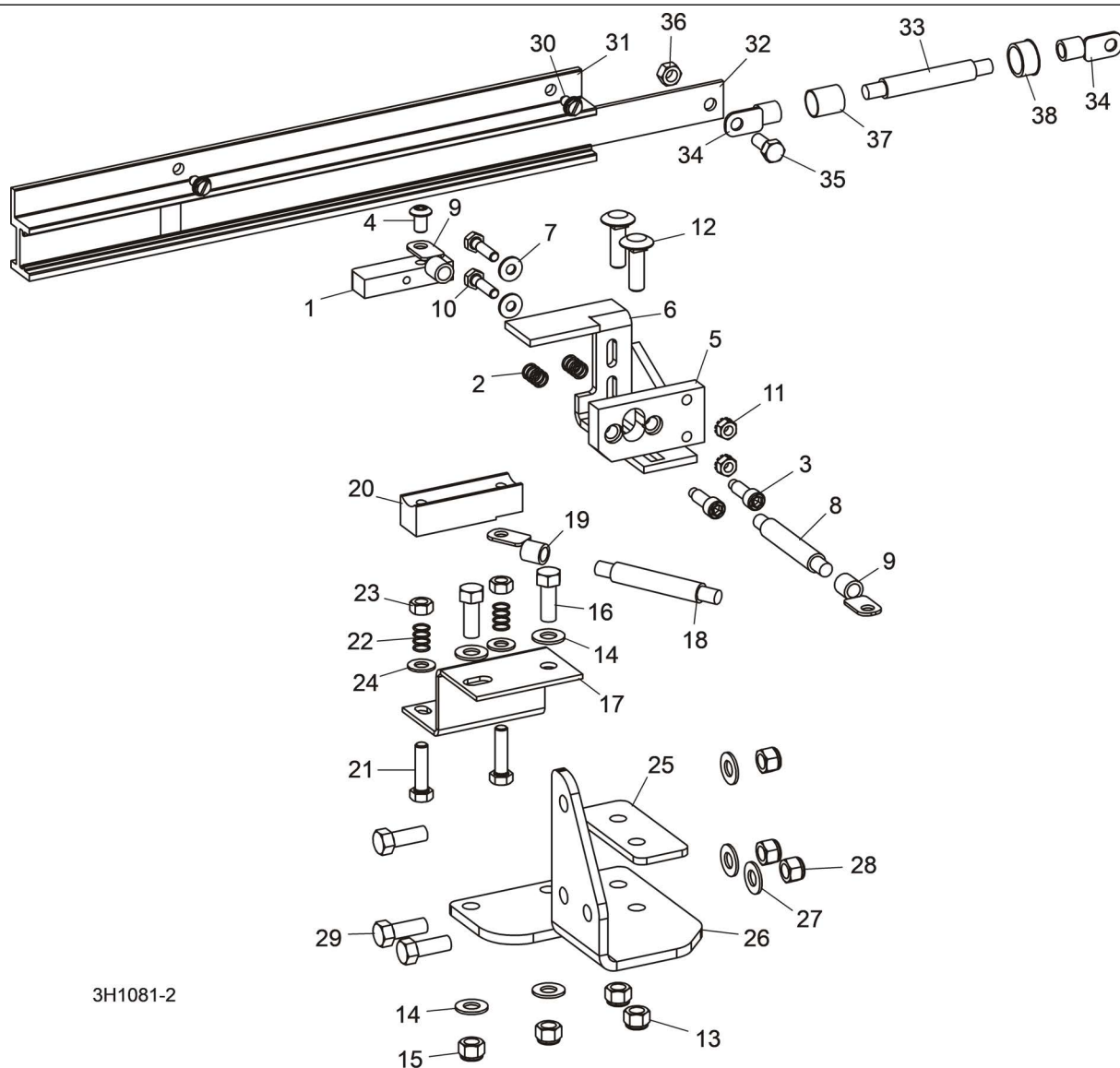
4.3 Hydraulic Power Supply Strip



REF	PART #	DESCRIPTION	COMMENTS	QTY.
	036721	CONTACT ASSEMBLY, HYDRAULIC POWER SUPPLY (POSITIVE) (HLA-A PRIOR TO REV. A3.00)		1
	010103	CONTACT ASSEMBLY, HYDRAULIC POWER SUPPLY (POSITIVE) (HLA-A REV. A3.00 AND LATER)		1
	007716	Contact Kit, 97+ Hydraulic Power Supply Positive		1
1	015253	Contact, Hydraulic Power Supply (Positive)		1
2	P10077	Spring, Positive Contact		2
3	F05006-143	Bolt, 5/16" X 3/4" Shoulder (1/4-20 Thread) Stainless		2
4	F05006-20	Bolt, 5/16-18 x 1/2" Socket Button Head		1
5	S10072	Insulator, Positive Contact		1
6	015324	Bracket, Positive Contact Mounting		1
7	F05011-11	Washer, 1/4" SAE Flat		2
	074120	Cable Assembly, Hydraulic Positive Contact (HLA-A Prior to Rev. A3.00)		1
	N/A	Cable Assembly, Hydraulic Positive Contact (HLA-A Rev. A3.00 and later)		1
8				

REF	PART #	DESCRIPTION	COMMENTS	QTY.
	R01971	Cable, #1 Weld (HLA-A Prior to Rev. A3.00)	Available in assemblies only.	1.71 Ft
	R01971-1	Cable, #1 Weld (HLA-A Rev. A3.00 and later)	Available in assemblies only.	1.17 Ft
	F05092-16	Terminal, 5/16" Ring #2 Gauge		2
9	F05005-38	Bolt, 1/4-20 X 1" Hex Head Grade 2		2
10	F05010-9	Nut, 1/4-20 Hex Self-Locking		2
11	F05007-11	Bolt, 3/8-16 X 1 1/4" Carriage Head		2
12	F05010-10	Nut, 3/8-16 Hex Nylon Lock		2
	010104	CONTACT KIT, HYDRAULIC POWER SUPPLY (GROUND)		1
13	F05011-3	Washer, 3/8" SAE Flat		2
14	F05010-10	Nut, 3/8-16 Hex Nylon Lock		2
15	F05007-175	Bolt, 3/8-16 X 4" Square Head		2
16	016792	Bracket, Ground Contact Mounting		1
17	036306	Cable Assy, Hydraulic Negative Contact (Ground) #1 Weld		1
	R01971	Cable, #1 Weld	Available in assemblies only.	2.2 Ft
18	F05092-16	Terminal, 5/16" Ring #2 Gauge		2
	007717	Contact Kit, Hydraulic Power Supply Ground		1
	015264	Contact, Hydraulic Power Supply (Ground)		1
19	F05006-93	Bolt, 5/16-18 X 1 1/4" Hex Head Full Thread Grade 5		2
20	P10077	Spring, Ground Contact		2
21	F05010-17	Nut, 5/16-18 Hex		2
22	F05011-17	Washer, 5/16" SAE Flat		2
	143116	ASSY, 4 FT CONTACT STRIP	Replaced A11977 after 8/14/2025 per ECN 39819.	1
23	F05015-1	BOLT, 1/4-20 X 1/2" SELF TAP HH		5
24	143015	HOUSING, CONTACT STRIP 48"		1
25	143016	CONTACT STRIP, 1/8X1X48 COPPER		1
26	F05011-11	WASHER, 5/16 SAE FLAT		2
27	052161	CABLE ASSY, 1AWG BLACK X 36		1
28	F05006-45	BOLT, 5/16-18X3/4 HH PLASTIC BLK		1
29	F05010-88	NUT, 5/16-18 PLASTIC HEX		1
30	R01950-8	TUBING, 5/8" HEAT SHRINK W. ADHESIVE ID		1
31	P04137	GROMMET, 5/8 WIRE		1
	A12043-406	INSTRUCTION SHEET, STRIP REPLACEMENT		1
	A11977	STRIP ASSEMBLY, 6' HYDRAULIC POWER SUPPLY W/3 FT. CABLE	Replaced by 143116 after 8/14/2025 per ECN 39819.	1
32	F05015-1	Screw, 1/4-20 X 1/2" Slotted Hex Head		8
33	P11976	Housing, 6' Contact Strip		1
	A12043-N	Strip, 6' Contact With Cable		1
34	S10075	Strip, 6' Contact	Available in assemblies only.	1
35	052161	Cable Assembly, Hydraulic Contact Strip		1
	R01971	Cable, #1 Weld	Available in assemblies only.	3 Ft
36	F05092-16	Terminal, 5/16" Ring #2 Gauge		2
37	F05006-45	Bolt, 5/16-18 X 3/4" Hex Head Black Nylon		1

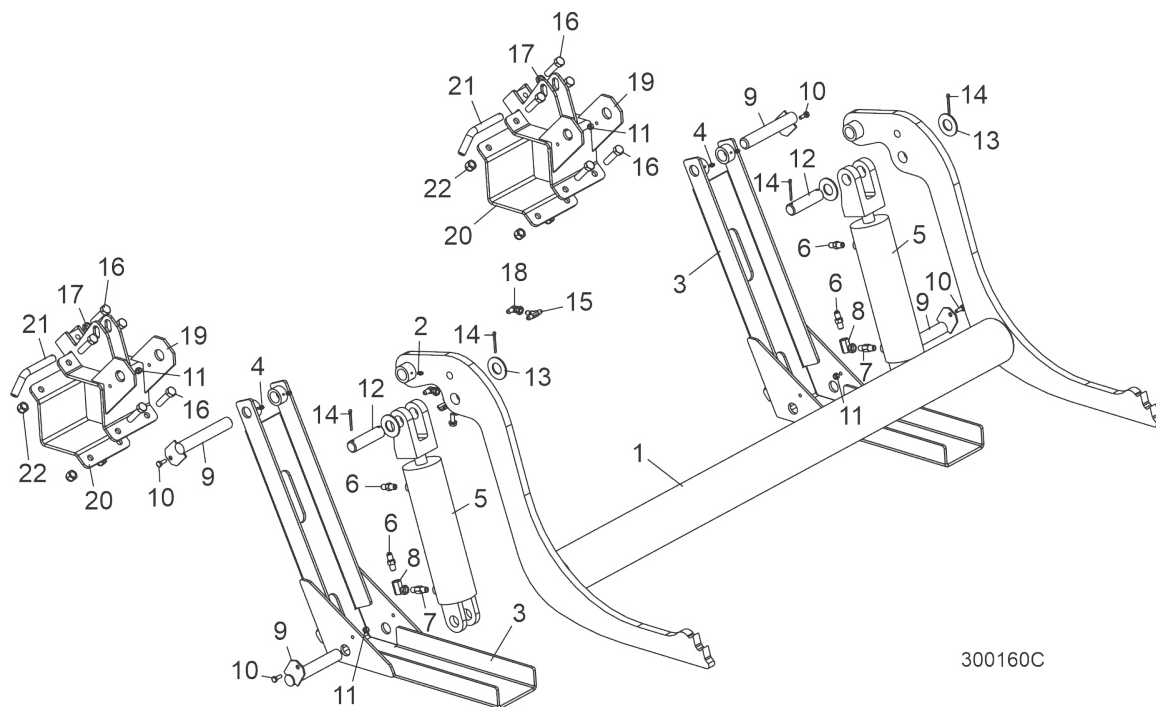
REF	PART #	DESCRIPTION	COMMENTS	QTY.
38	F05010-86	Nut, 5/16-18 Hex Black Nylon		1
39	R01950-5	Tube, 5/8" Heat Shrink	Available in assemblies only.	1.04 Ft
40	P04137	Grommet, 5/8" Wire		1



REF	PART #	DESCRIPTION	COMMENTS	QTY.
	010103	CONTACT ASSEMBLY, LT35 HYDRAULIC POWER SUPPLY (POSITIVE)		1
	007716	Contact Kit, 97+ Hydraulic Power Supply Positive		1
1	015253	Contact, Hydraulic Power Supply (Positive)	Available in assemblies only.	1
2	P10077	Spring, Positive Contact		2
3	F05006-143	Bolt, 5/16" x 3/4" Shoulder (1/4-20 Thread) Stainless		2
4	F05006-20	Bolt, 5/16-18 x 1/2" Socket Button Head		1
5	S10072	Insulator, Positive Contact		1
6	015324	Bracket, Positive Contact Mounting		1

REF	PART #	DESCRIPTION	COMMENTS	QTY.
7	F05011-11	Washer, 1/4" SAE Flat		2
8	R01971	Cable, #1 Weld	Available in assemblies only.	1 Ft
9	F05092-16	Terminal, 5/16" Ring #2 Gauge		2
10	F05005-38	Bolt, 1/4-20 x 1" Hex Head Grade 2		2
11	F05010-9	Nut, 1/4-20 Hex Self-Locking		2
12	F05007-11	Bolt, 3/8-16 x 1 1/4" Carriage Head		2
13	F05010-10	Nut, 3/8-16 Hex Nylon Lock		2
	065081	CONTACT ASSEMBLY, LT35 HYDRAULIC POWER SUPPLY (GROUND)		1
14	F05011-3	Washer, 3/8" SAE Flat		4
15	F05010-10	Nut, 3/8-16 Hex Nylon Lock		2
16	F05007-7	Bolt, 3/8-16 x 4" Square Head		2
17	016792	Bracket, Ground Contact Mounting		1
18	R01971	Cable, #1 Weld	Available in assemblies only.	1 Ft
19	F05092-16	Terminal, 5/16" Ring #2 Gauge		1
	007717	Contact Kit, Hydraulic Ground 1997+		1
20	015264	Contact, Hydraulic Power Supply (Ground)	Available in assemblies only.	1
21	F05006-93	Bolt, 5/16-18 x 1 1/4" Hex Head Full Thread Grade 5		2
22	P10077	Spring, Ground Contact		2
23	F05010-17	Nut, 5/16-18 Hex		2
24	F05011-17	Washer, 5/16" SAE Flat		2
25	025964	PLATE, LT35 POSITIVE CONTACT SPACER		1
26	059636	PLATE, LT35 CONTACT MOUNT		1
27	F05011-3	WASHER, 3/8" SAE FLAT		3
28	F05010-10	NUT, 3/8-16 HEX NYLON LOCK		3
29	F05007-7	BOLT, 3/8-16 X 4" SQUARE HEAD		3
	065046	STRIP ASSEMBLY, LT35 CONTACT		1
30	F05015-1	Bolt, 1/4-20 x 1/2" Self Tap HH		2
31	065044	Housing, LT35 Contact Strip		1
32	065045	Strip, 1/8" x 1" x 15-13/16" Contact		1
33	R01971	Cable, 1AWG SO Welding		1
34	F05092-16	Terminal, 5/16" 1-2Ga Ring NI Loose		2
35	F05006-45	Screw, 5/16-18 x 3/4" Black Nylon HHC		1
36	F05010-86	Nut, 5/16-18 Black Nylon Hex		1
37	R01950-5	Tubing, 5/8" Heat Shrink		1
38	P04137	Grommet, 5/8" Wire		1

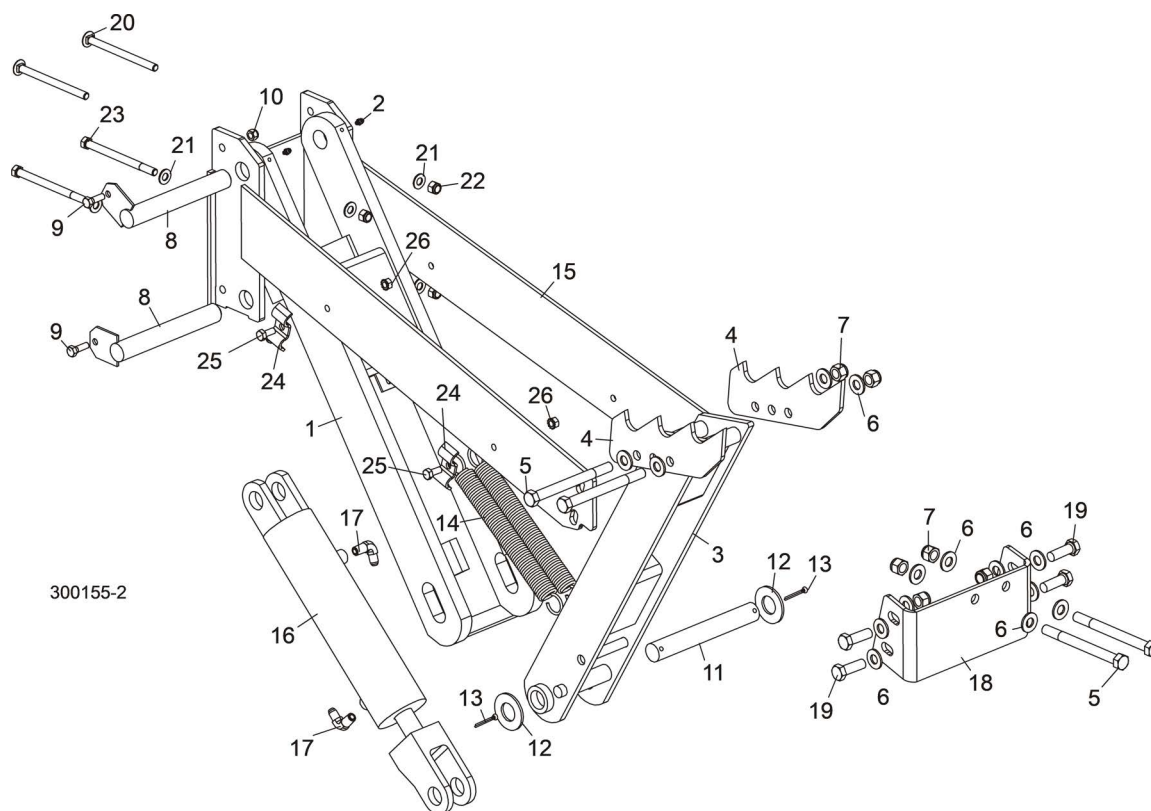
4.4 Hydraulic Log Loader



REF	PART #	DESCRIPTION	COMMENTS	QTY.
1	110372	ARM, HYDRAULIC LOG LOADING	Replaced 036722 per ECN 37838	1
2	P04107	FITTING, 3/16" GREASE		2
3	W09444	CHANNEL, HYDRAULIC LOG LOADING FOOT		2
4	P04107	FITTING, 3/16" GREASE		4
	A09284	CYLINDER ASSEMBLY, HYDRAULIC LOG LOADING ARM	Available in assemblies only.	2
5	P12847	Cylinder, 8" X 3" Hydraulic		1
	P12956	Seal Kit, 8" x 3" Hydraulic Cylinder		1
6	P09143	Fitting, C5205x4x4 Male Connector		2
7	P12199	Fitting, 0455x4x4 90° Swivel Elbow		1
	015832	Fitting Kit, 1/4NPT 5.0GPM Velocity Fuse		1
8	015750	Fitting, 1/4NPT 5.0GPM Velocity Fuse	Available in assemblies only.	2
	015832-255	Instruction Sheet, Velocity Fuse Replacement		1
9	W09446	PIN, LOADING ARM MOUNT		4
10	F05005-1	BOLT, 1/4-20 X 3/4" HEX HEAD FULL THREAD		4
11	F05010-69	NUT, 1/4-20 HEX LOCK		4
12	S09251	PIN, LOADING ARM CYLINDER MOUNT		2
13	F05011-28	WASHER, 1" SAE FLAT		4
14	F05012-23	PIN, 3/16" X 1 1/2" COTTER		4
15	P09145	FITTING, C5705X5X4 UNION 'T'		2
16	F05008-116	BOLT, 1/2-13 X 2" HEX HEAD FULL THREAD GRADE 5		10
17	F05010-31	NUT, 1/2-13 JAM		2
18	036715	FITTING, 1/4" JIC X 1/4" JIC ELBOW		2
19	048270	MOUNT WELDMENT, LOADER ARM		2

REF	PART #	DESCRIPTION	COMMENTS	QTY.
20	036737	PLATE WELDMENT, LOADER ARM MOUNT		2
21	X200-987	PIN, BENT PULL, 5/8X3 W/HAIRPIN	Replaced 038472 per ECN 21063 (Rev. A3.01).	2
22	F05010-8	NUT, 1/2-13 HEX NYLON LOCK		8
	F05012-62	PIN, #210 HITCH	Deleted after 1/2/2024 per ECN 39259	2

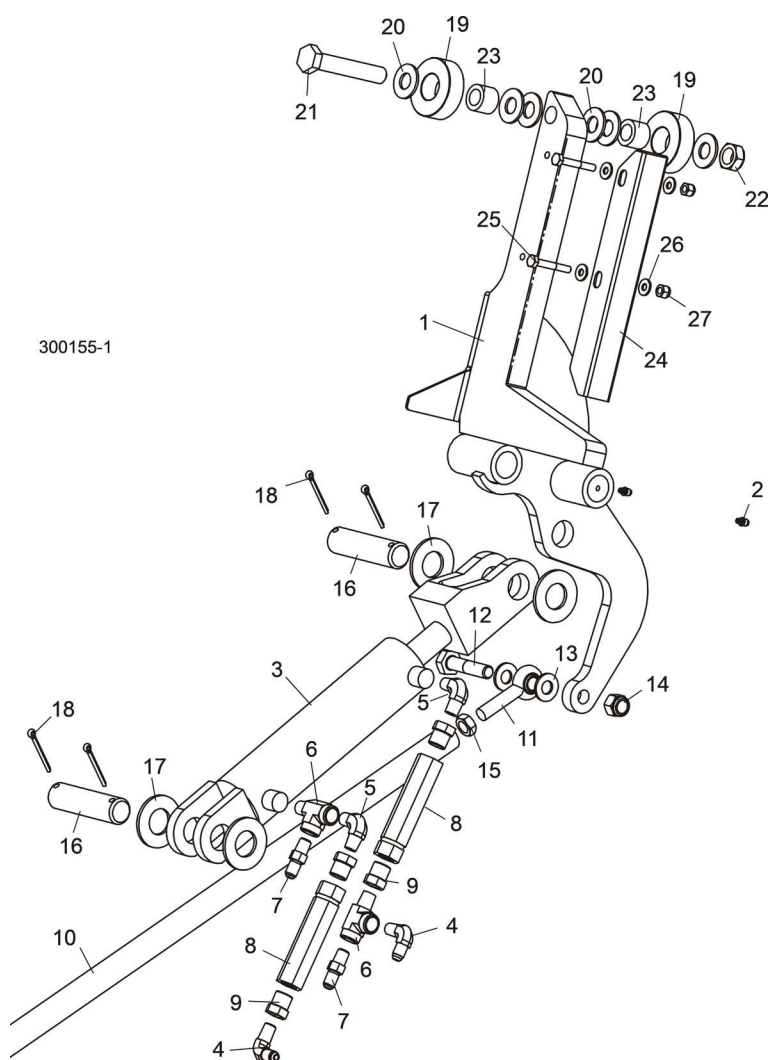
4.5 Hydraulic Log Turner



REF	PART #	DESCRIPTION	COMMENTS	QTY.
	007069	ARM ASSEMBLY, MANUAL MILL HYDRAULIC TURNER	Available in assemblies only.	1
1	015231	Arm, Hydraulic Log Turner Link		1
2	P04107	Fitting, 3/16" Grease		2
3	015233	Arm, Hydraulic Log Turner Painted		1
4	014675	Claw, Hydraulic Log Turner		2
5	F05008-28	Bolt, 1/2-13 X 5 1/2" Hex Head Grade 5		4
6	F05011-2	Washer, 1/2" SAE Flat		16
7	F05010-8	Nut, 1/2-13 Hex Nylon Lock		8
8	015085	Pin, Log Turner Mount		2
9	F05006-27	Bolt, 5/16-18x1 Gr5 HH	Replaced F05006-1 after 9/22/2025 per ECN 39888.	2
	F05006-1	Bolt, 5/16-18 X 1" Hex Head Grade 2	Replaced by F05006-27 after 9/22/2025 per ECN 39888.	2
10	F05010-58	Nut, 5/16-18 Hex Nylon Lock		2
11	S09246	Pin, Log Turner Pivot		1
12	F05011-28	Washer, 1" SAE Flat		2
13	F05012-23	Pin, 3/16" X 1 1/2" Cotter		2
14	015718	Spring, Hydraulic Log Turner		2
15	006999	Mount Weldment, Manual Mill Hydraulic Log Turner		1
	A09286	Cylinder Assembly, Hydraulic Log Turner		1
16	P12846	Cylinder, 8" X 2 1/2" Hydraulic	Available in assemblies only.	1
	P12955	Seal Kit, 8" x 2 1/2" Hydraulic Cylinder		1

REF	PART #	DESCRIPTION	COMMENTS	QTY.
17	P09142	Fitting, 1/4" NPT x 1/4" JIC 90° Male Elbow		2
18	007048	Plate, Manual Mill Hydraulic Log Turner Mount		1
19	F05008-33	Bolt, 1/2-13 x 1 1/2" Hex Head Grade 5		4
20	F05007-113	Bolt, 3/8-16 x 5" Carriage Head		2
21	F05011-3	Washer, 3/8" SAE Flat		6
22	F05010-10	Nut, 3/8-16 Hex Nylon Lock		4
23	F05007-5	Bolt, 3/8-16 x 5" Hex Head		2
24	S09245	Plate, 1/4" Hose Clamp		2
25	F05006-102	Bolt, 5/16-18 x 3/4" Hex Head Grade 5		2
26	F05010-20	Nut, 5/16-18 Hex Self-Locking		2

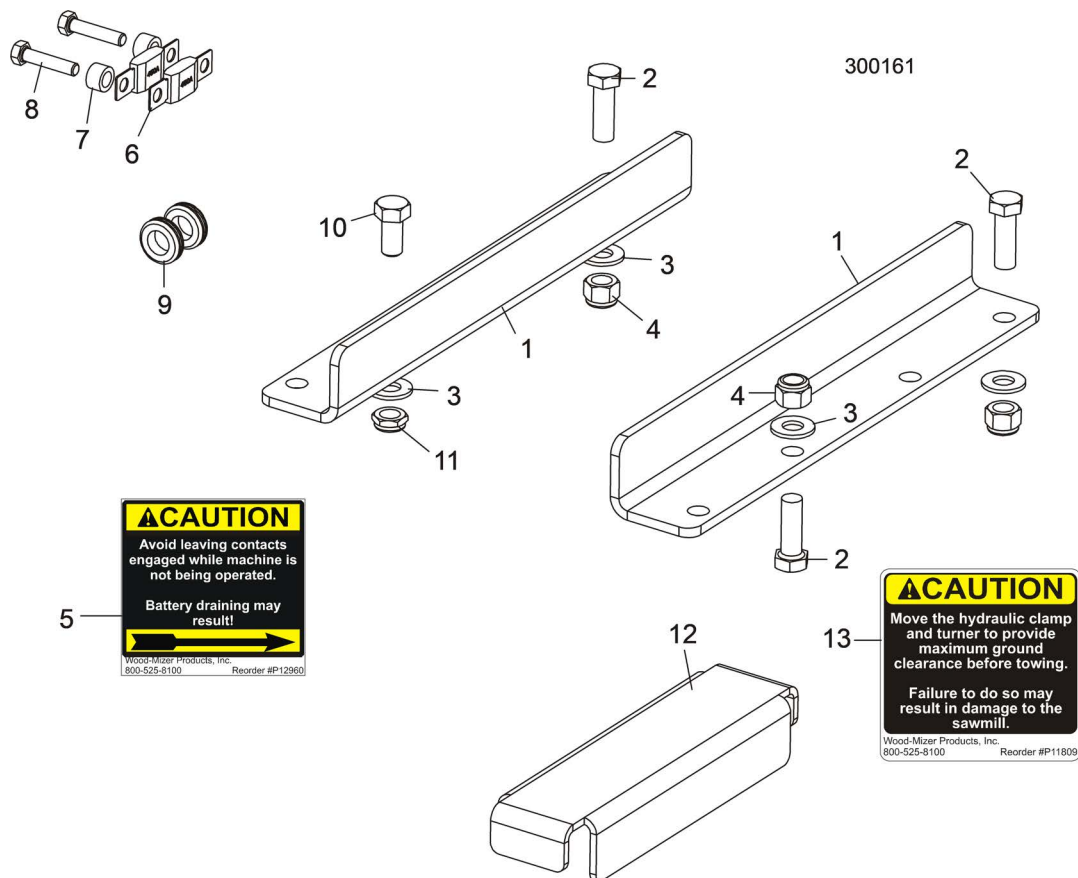
4.6 Hydraulic Side Supports



REF	PART #	DESCRIPTION	COMMENTS	QTY.
1	W12339	SUPPORT, HYDRAULIC LOG SIDE		2
2	P04107	Fitting, 3/16" Straight Grease		2
	A09283	CYLINDER ASSEMBLY, HYDRAULIC LOG SIDE SUPPORT		1
3	P12845	Cylinder, 6" X 2" Hydraulic		1
	P12954	Seal Kit, 6" x 2" Hydraulic Cylinder		1
4	P09142	Fitting, 1/4" NPT x 1/4" JIC 90° Male Elbow		2
5	P09140	Fitting, 1/4" NPT 90° Male Elbow		2
6	P09141	Fitting, 1/4" NPT x 1/4" JIC Male Run 'T'		2
7	P09143	Fitting, 1/4" NPT x 1/4" JIC Male Connector		2
8	015484	Valve, Hydraulic Sequence		2
9	015490	Fitting, 3/8" NPT - 1/4" NPT Reducer		4
10	015026	ROD, HYDRAULIC SIDE SUPPORT LINK		1
11	P09137	END, 1/2" ROD		2
12	F05008-10	BOLT, 1/2-13 X 2 1/4" HEX HEAD GRADE 5		2
13	F05011-2	WASHER, 1/2" SAE FLAT		4
14	F05010-8	NUT, 1/2-13 HEX NYLON LOCK		2
15	F05010-16	NUT, 1/2-20 HEX JAM		1

REF	PART #	DESCRIPTION	COMMENTS	QTY.
16	S09251	PIN, CYLINDER MOUNT		2
17	F05011-28	WASHER, 1" SAE FLAT		4
18	F05012-23	PIN, 3/16" X 1 1/2" COTTER		4
	016562	ROLLER KIT, SIDE SUPPORT (OPTIONAL)		2
19	016561	Roller, Side Support		2
20	F05011-5	Washer, 5/8" SAE Flat	Additional 5/8" SAE Flat Washer F05011-5 may be required on each side of side support to provide clearance for optional stainless steel side support guards.	6
21	F05009-118	Bolt, 5/8-11 x 3 3/4" Hex Head Grade 5		1
22	F05010-96	Nut, 5/8-11 Hex Nylon Lock Jam		1
23	016560	Bushing, Bronze 5/8" x 1" x 3/4"		2
	F05008-94	Bolt, 1/2-13 x 3 1/2" Carriage Head		1
	016562-526	Instruction Sheet, Side Support Roller		1
	016798	GUARD KIT, STAINLESS STEEL SIDE SUPPORT (OPTIONAL)		1
24	016722	Guard, Stainless Steel Side Support		4
25	F05005-4	Bolt, 1/4-20 x 1 3/4" Hex Head		8
26	F05011-11	Washer, 1/4" SAE Flat		16
	F05011-5	Washer, 5/8" SAE Flat	Additional 5/8" SAE Flat Washer F05011-5 may be required on each side of side support to provide clearance for optional stainless steel side support guards.	4
27	F05010-69	Nut, 1/4-20 Hex Nylon Lock		8
	016798-1005	Instruction Sheet, Stainless Steel Side Support Guard Retro		1

4.7 Miscellaneous



REF	PART #	DESCRIPTION	COMMENTS	QTY.
1	048269	PLATE, AXLE MOUNT		2
2	F05008-33	BOLT, 1/2-13 X 1 1/2" HEX HEAD GRADE 5		3
3	F05011-2	WASHER, 1/2" SAE FLAT		4
4	F05010-8	NUT, 1/2" HEX NYLON LOCK		3
5	P12960	DECAL, HYDRAULIC CONTACT CAUTION		1
6	053339	FUSE, 225A 32V MEGA		2
7	055323	SPACER, .39" X .625" X .39"		2
8	F05006-2	BOLT, 5/16-18 X 1 1/2" HEX HEAD FULL THREAD		2
9	P11764	GROMMET, 5/8" ID RUBBER		2
10	F05008-128	BOLT, 1/2-13 X 1" HEX HEAD GRADE 8		1
11	F05010-127	NUT, 1/2-13 HEX NYLON HALF NUT		1
12	025745	PLATE, HLT TRAVEL		1
13	P11809	DECAL, BEFORE TOWING CAUTION		1