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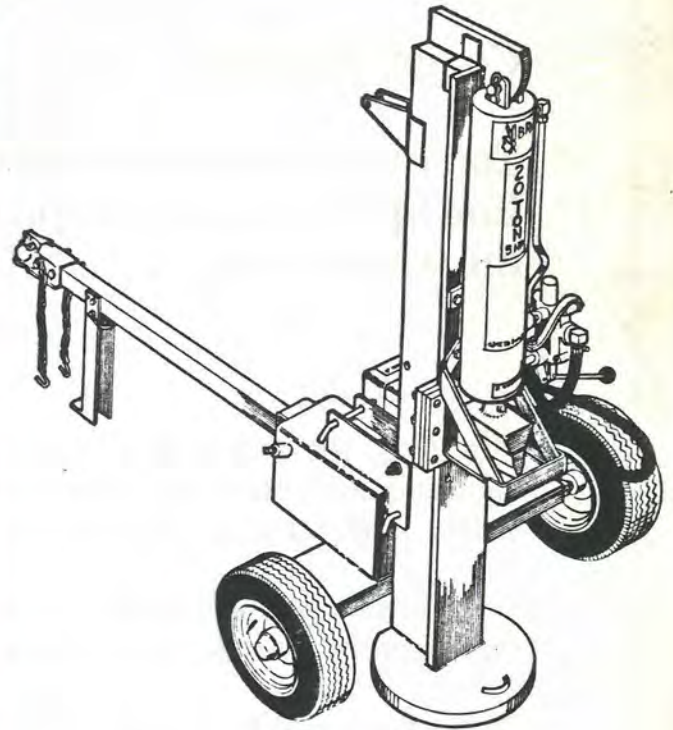
# OWNERS MANUAL

**MODEL NO.**

**VH-9020  
VH-9024  
BHVH-2090  
BHVH-2490**

**CAUTION:**

**READ RULES FOR  
SAFE OPERATION  
AND INSTRUCTIONS  
CAREFULLY**



**VERTICAL / HORIZONTAL**

**20 AND 24 TON  
LOG SPLITTER**

**ASSEMBLY**

**OPERATION**

**MAINTENANCE**



**WARNING: USE CARE AND CAUTION  
AT ALL TIMES WHEN OPERATING THIS  
EQUIPMENT!**

**CAUTION: The operating and safety instructions contained in this manual have been written for your use. Failure to read and follow these instructions could result in serious injury.**

## **Congratulations:**

**You have just purchased one of the finest Log Splitters manufactured anywhere in the world today.**



Thank you for putting your trust in our product. Brave Industries manufactures the highest quality products, featuring the latest technology, to insure complete customer satisfaction and years of trouble-free service from your Brave product.

Your owners manual contains very important information and safety instructions regarding the safe operation of your new Brave Log Splitter.

Please be sure to thoroughly read and understand the safety and operations instructions before you use your log splitter. Never allow anyone who hasn't read these instructions to operate your log splitter.

Should you have questions regarding the safe operation of your log splitter, the repair or maintenance of your log splitter, or any other questions please call us:

**BRAVE CUSTOMER SERVICE HOTLINE: 1-800-637-1280**

Brave Industries also manufactures Shredders, Chippers, Mulchers, Compost Bins, Splitting Mauls, Striking Tools, and Wood Cutting Accessories. Should you have a need for these products we hope you will look to Brave Industries, Inc.

Thank You,

Brave Industries

**REMEMBER:** Power equipment products like the Brave Log Splitter are dangerous. If you do not understand and regard the safe operating instructions serious injury or death may result.

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## WARNING:

Before assembling and operating your Brave Log splitter, you must read and understand completely the safe operation instructions in this book. Do not allow any person to use or operate your Brave Log splitter who has not read the safe operations instructions.

Call 1-800-637-1280 for assistance.

The operating and safety instructions contained in this manual have been written for your use in operating your Brave Log splitter. Failure to read and understand this manual or failure to follow the operating and safety instructions could result in serious injury or loss of life to the operator or bystanders.



# OPERATING INSTRUCTIONS

## INTENDED USE

Your Brave Log Splitter is designed for the specific task of splitting wood. NEVER use your log splitter for any other purpose. Using your log splitter for an unintended purpose could cause injury.

## **OPERATORS RESPONSIBILITY:**

### **THE OPERATOR OF THE LOG SPLITTER MUST:**

Never allow more than one person to operate the log splitter at any one time.

Most accidents occur when more than one person is operating the log splitter. If a helper is loading logs never actuate the controls until the area is clear.

Never allow children to operate the log splitter. Never allow anyone lacking proper instruction to operate your log splitter.

Only the operator of the log splitter should be near the equipment while in use. Keep all others, including pets, at least 25 feet away at all times.

Never operate your log splitter while under the influence of alcohol, drugs, or any medication, or under any condition in which you are not fully alert. You will need 100% of your concentration on the log splitter.

## **SAFETY WEAR / CLOTHING**

### **WHEN USING YOUR LOG SPLITTER:**

- Never wear loose clothing or jewelry that can get caught or become entangled in the moving parts of the machine.
- Always wear protective head gear and keep hair away from moving parts.
- Always wear safety glasses or goggles.
- Always wear steel toed shoes or boots.
- Always wear gloves which do not have loose fitting cuffs or draw strings.
- Always wear a protective hearing device.



## **PREPARING THE WORK SITE**

- Never operate your log splitter on slippery, wet, muddy, or icy surfaces. The location you choose should be flat, dry, and free from any tall grass, brush, or other interferences.
- Always operate your log splitter on dry, solid, level ground.
- Never attempt to move your log splitter over hilly or uneven terrain without a tow vehicle.
- Always block wheels to prevent movement of machine while in operation.
- Never use your log splitter at night, only under well lighted conditions.
- Never operate engine in an enclosed area. Exhaust fumes contain carbon monoxide which can be deadly when inhaled.

## **PREPARING THE LOG**

- Always make sure that both ends of the log you are splitting are cut as square as possible. This will prevent the log from sliding out of position while under pressure.
- Never attempt to split any log that is not cut square.

## **INSPECTING THE LOG SPLITTER**

- Always inspect your log splitter before each use. Always check that all nuts, bolts, and screws are securely tightened. Always check to see that the hydraulic oil tank and engine reservoir are full.
- Never operate your log splitter when it is need of repair or under poor mechanical condition.
- Always disconnect spark plug lead when unit is not in operation.
- Never tamper with the engine to run it at excessive speeds. The maximum engine speed is preset by the manufacturer and is within safety limits.
- Never make alterations to your log splitter in any manner. Such alterations may cause log splitter to become unsafe.
- Never attach a rope or extension to the control lever or add width or height to the splitting wedge. Such alterations may cause the log splitter to become unsafe.
- Always clean unit after each use. If possible, store unit inside or cover completely if stored outside.

## **INSPECT THE HYDRAULIC SYSTEM**

Extremely high fluid pressures are developed in hydraulic log splitters. Pressurized hydraulic fluid escaping through a pin hole can penetrate the skin or cause blood poisoning.

The following instructions should be followed at all times.

- (1) Do not operate the unit with frayed, kinked, cracked, or damaged hoses, fittings, or tubing.
- (2) Stop the engine and relieve hydraulic pressure before changing or adjusting fittings, hoses, tubing, or any other hydraulic system component.
- (3) Do not adjust the pressure setting of the pump or valve. They are preset by the manufacturer.
- (4) Do not check for leaks with your hand. Leaks can be located by passing cardboard or wood over the area. If injured by escaping fluid, see a doctor immediately. Serious infection or reaction can develop if proper medical treatment is not administered at once.
- (5) Never operate your log splitter if the hydraulic system is low or if the log splitter is out of hydraulic fluid.

## **TOWING**

Always check before towing to be certain your log splitter is correctly and securely attached to the towing vehicle. Be sure that the ball hitch you are using is the proper size for the hitch on the log splitter. Be sure the safety chains are properly hooked to the vehicle leaving slack enough for turning.

Never exceed 35 MPH when towing your log splitter. Obey all state and local regulations when towing on state and local roads and highways. Adjust your speed for terrain and conditions as needed. Be extra cautious when towing over rough terrain, especially over railroad crossings.

Never tow your log splitter when there is fuel in the gas tank. Be sure the tank is drained before moving the log splitter.

Never allow anyone to sit or ride on your log splitter.

Never carry any cargo or wood on your log splitter.

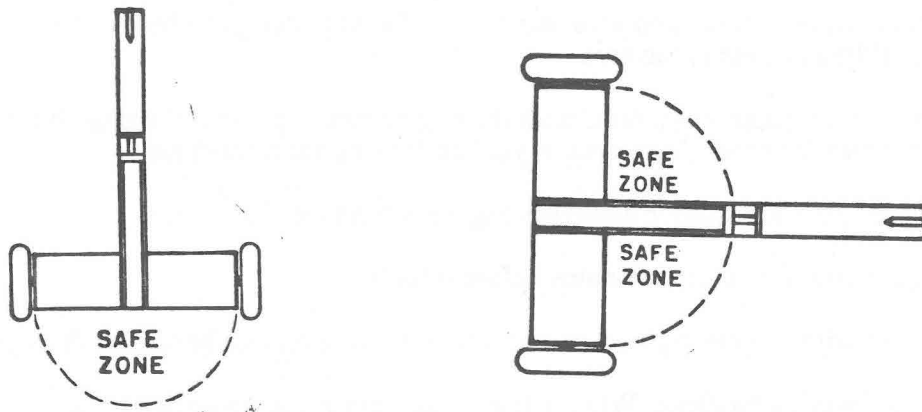
Always allow for added length of the log splitter when turning, parking, crossing intersections, and in all driving situations.

Always be careful when backing up: You can easily jack-knife your log splitter.

Always disconnect your log splitter from your towing vehicle before attempting to use it.

## SAFE OPERATING PROCEDURE

Always operate your log splitter from the safe operators zone (shown below).



Always keep hands, feet, or any part of your body clear of moving parts. Never place hands, feet, or any part of your body between the log and splitting wedge, or between log and ram during forward or reverse stroke.

Never straddle your log splitter when using it. A slip in any position could cause injury.

Never try to split two logs at any time. Do not position one log on top of another or two logs in succession to split them.

Always keep clothing, hair, hands, feet, or any part of your body clear of moving parts.

Never step or try to jump over your log splitter.

Never attempt to load your log splitter while ram is in motion.

Always use your hand to operate the control lever and ram. Never use your foot, a rope, or any extension device, or anything else.

Always keep fingers away from any cracks that occur in the log. If the crack closes you could pinch or amputate your finger or hand.

When loading a log on your splitter, place your hands on the side of the log. Never place your hands on the end of the log where they could come into contact with the splitting wedge, ram, or base plate.

Never move your log splitter while engine is running. Let engine cool before moving the log splitter.

## **SAFE OPERATING PROCEDURE**

Never allow children or pets around your work area. Do not attempt to begin work if there are unsupervised children or pets in the area.

Never leave your log splitter unattended with the engine running. Shut the engine off and remove the spark plug wire from the spark plug, even if you are leaving for a short time.

Never try to refuel your log splitter while the engine is running.

Always let engine cool for several minutes before refueling.

Never try to make adjustments, tighten screws, check fluid levels, or hoses, while engine is running.

Always keep your work area clear. When a log is split remove it immediately and place it on your pile.

Use a system. Place split logs 15 feet to one side of your log splitter, place logs to be split 15 feet to the other side of your log splitter.

Always be sure the log to be split is positioned securely on the log splitter and does not need to be supported while you actuate the controls.

Use a saw to cut the log to be split, so that it will sit securely on the log splitter without having to be supported in any way.

Always be sure to split your wood with the grain of the wood down, or the length of the log from one cut end to the other. Never try to split across the grain.

**REMEMBER: THE LOG SPLITTER IS A DANGEROUS PIECE OF MACHINERY. DO NOT OPERATE IT WITHOUT READING AND UNDERSTANDING THIS OPERATIONS MANUAL.**

**BRAVE SERVICE HOTLINE NUMBER: 1-800-637-1280**





## **PREVENT FIRE**

Always take a class "B" fire extinguisher with you when operating your log splitter in dry areas as a precautionary measure against possible fire caused by flying sparks.

Never operate your log splitter near an open flame or spark. The fuel and hydraulic fluid oil are flammable and could explode.

Never try to fill the fuel tank while the engine is running or if the engine is hot. Let it cool for several minutes.

Never smoke while operating or refueling your log splitter. Gas fumes can easily explode.

Always refuel your log splitter in an open area void of gas fumes or spilled gas. Always use an approved fuel container. Always replace the fuel cap tightly.

**If you spill gasoline while filling the tank, do not start up the log splitter until the spilled gasoline has evaporated.**

Never tow or transport your log splitter when there is fuel in the tank. Drain the fuel tank before moving it.

Always drain the fuel tank prior to storage. This guards against the accumulation of fuel fumes which could result in a fire hazard.

Always store gasoline in an approved fuel container, in a cool, dry place. Do not store in the house or near heating appliances.

## **STORAGE**

Always be sure engine is turned off and spark plug wire is disconnected before you begin to clean your log splitter.

Clean debris and chaff from your log splitter using a broom. Take special care to remove all debris from engine and moving parts.

Always check the physical condition of your log splitter. Check bolts, nuts, etc. to be sure they are tightened securely. Check for physical damage that should be repaired before using again.

Never store your log splitter with fuel in the tank. Drain all fuel prior to storing the unit.

Check your engine owners manual for the proper procedure for storage of the engine.

## ASSEMBLY INSTRUCTIONS VH-9020 , BHVH-2090

### TOOLS REQUIRED

10" crescent wrench, flat head screw driver, open end wrenches, two 9/16" wrenches, two 3/4" wrenches and a pipe wrench, funnel, engine oil, lead free gasoline, hydraulic fluid.

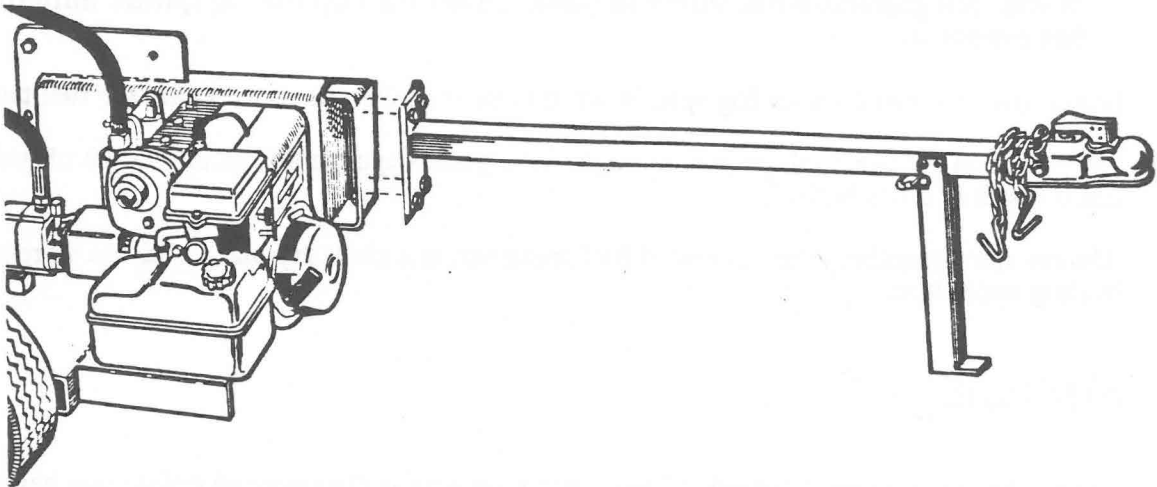
### Step 1

Remove all components from crate and check for shipping damage. **Note:** All needed hardware is packed in a cardboard box.

### Step 2

Assemble hitch coupler to tongue by placing one 3/8" x 3" hex head bolt - GR 5, through the side of the hitch coupler. Continue through the tongue. Secure with a 3/8" flat washer and a 3/8" lock nut. (See also figure 3).

VH-9020 , BHVH-2090



### Step 3

Next place one 3/8" x 3-1/2" hex head bolt with 3/8" flat washer through top point of safety chain, then through the hitch coupler and tongue, then through the top point of the other safety chain. Secure with 3/8" flat washer and 3/8" lock nut.

### Step 4

Position stabilizer leg perpendicular to the tongue as shown above and secure.

### Step 5

Place base channel with engine assembly on blocks to prevent tilting. (See figure 1).

### Step 6

Attach tongue assembly as shown above to base assembly by using 4-1/2"-13 x 1-1/2" hex head bolt GR 5 along with nuts and lock washers.

### Step 7

Assemble base and tongue assembly to rail assembly.

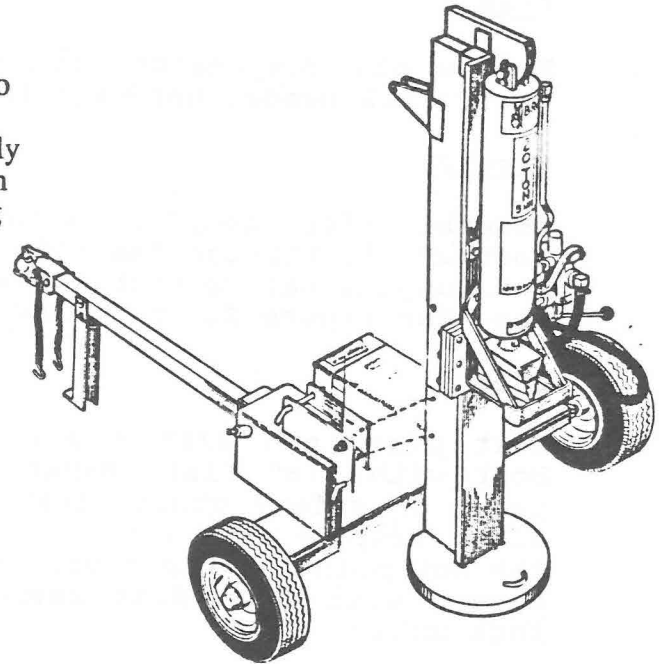
VH-9020 , BHVH-2090

Stand the rail assembly upright and align the bracket that is welded to the hydraulic tank to the holes on the rail assembly.

Insert one 1/2" x 4-1/2" fine threaded hex head bolt into hole and secure with a 1/2" flat washer and a 1/2" fine threaded lock nut. Make sure nuts and bolts are securely tightened, but do not over tighten. Insert the 1/2" pin in the bottom hole and secure, to prevent rail from tipping over.

### Step 8

Attach the high pressure hose (fig. 1, ref. 2) that is attached to the pump and connect it to the 90 degree elbow fitting (fig. 2, ref. 29) located on the 'in' port of the control valve.



### Step 9

Use your 10" crescent wrench to tighten the hydraulic hose. No pipe thread compound is necessary. Route the low pressure return hose from the outside of the valve and connect it to the elbow on the filter head. Using a regular screw driver, tighten the hose clamp. (See fig. 1, hose ref. 3, clamp ref. 2).

### Step 10

Refer to valve standard features to show how valve handle attaches to valve.

**Caution:** Always be sure to re-insert the latch rod locking pin (See fig. 1, ref. 7) when lowering the rail in the tongue assembly for horizontal usage or for towing.

### Step 11

Lower the rail assembly by removing the 1/2" pin into the horizontal position and using the 1/2" pin (previously used in securing the rail in the upright position), then secure the rail to the rail support leg.

# Assembly Instructions for VH-9024

## TOOLS REQUIRED

10" Crescent Wrench, Flat Head Screw Driver, Open End Wrenches-two 9/16" Wrenches, Two 3/4" Wrenches and a Pipe Wrench, Funnel, Engine Oil (See engine manual), Lead Free Gasoline, Hydraulic Fluid.

### Step 1

Remove all components from crate and check for shipping damage.  
NOTE: All needed hardware is packaged in a small cardboard box.

### Step 2

Assemble hitch coupler to tongue by placing one 3/8" X 3" hex head bolt-GR. 5, through the side of the hitch coupler. Continue through the tongue. Secure with one 3/8" flat washer and one 3/8" lock nut. See also figure #3 on following pages.

### Step 3

Next place one 3/8" X 3-1/2" hex head bolt with 3/8" flat washer through top point of safety chain, then through the hitch coupler and tongue, then through the top point of the other safety chain. Secure with 3/8" flat washer and 3/8" lock nut.

### Step 4

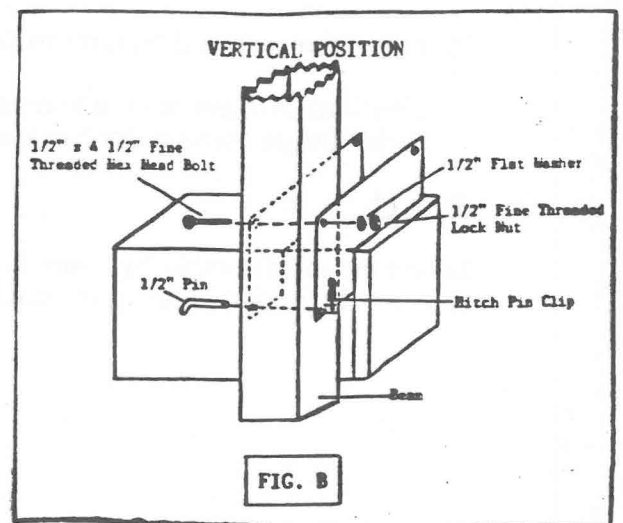
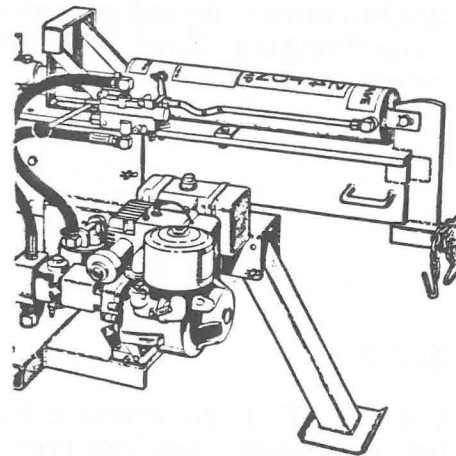
Position Stabilizer Leg at a 45 degree angle to the rail assembly, assemble as shown and secure with pins.

### Step 5

Place base channel with engine assembly on blocks to prevent tilting. Also see figure 1 on following pages.

### Step 6

Stand the rail assembly upright and align the bracket that is welded to the hydraulic tank to the holes on the rail assembly. Insert one 1/2" x 4-1/2" fine threaded hex head bolt into hole and secure with a 1/2" flat washer and a 1/2" fine threaded lock nut. Make sure nuts and bolts are securely tightened, but do not over tighten. Insert the 1/2" pin in the bottom hole and secure, to prevent rail from tipping over.



### Step 7

Attach the high pressure hose (figure 1, reference 2) that is attached to the pump and connect it to the 90 degree elbow fitting (figure 2, reference 29) located on the 'in' port of the control valve.

### Step 8

Use your 10" crescent wrench to tighten the hydraulic hose. No pipe thread compound is necessary. Route the low pressure return hose from the outside of the valve and connect it to the elbow on the filter head. Using a regular screw driver, tighten the hose clamp (see figure 1, hose reference #3, clamp reference #2).

### Step 9

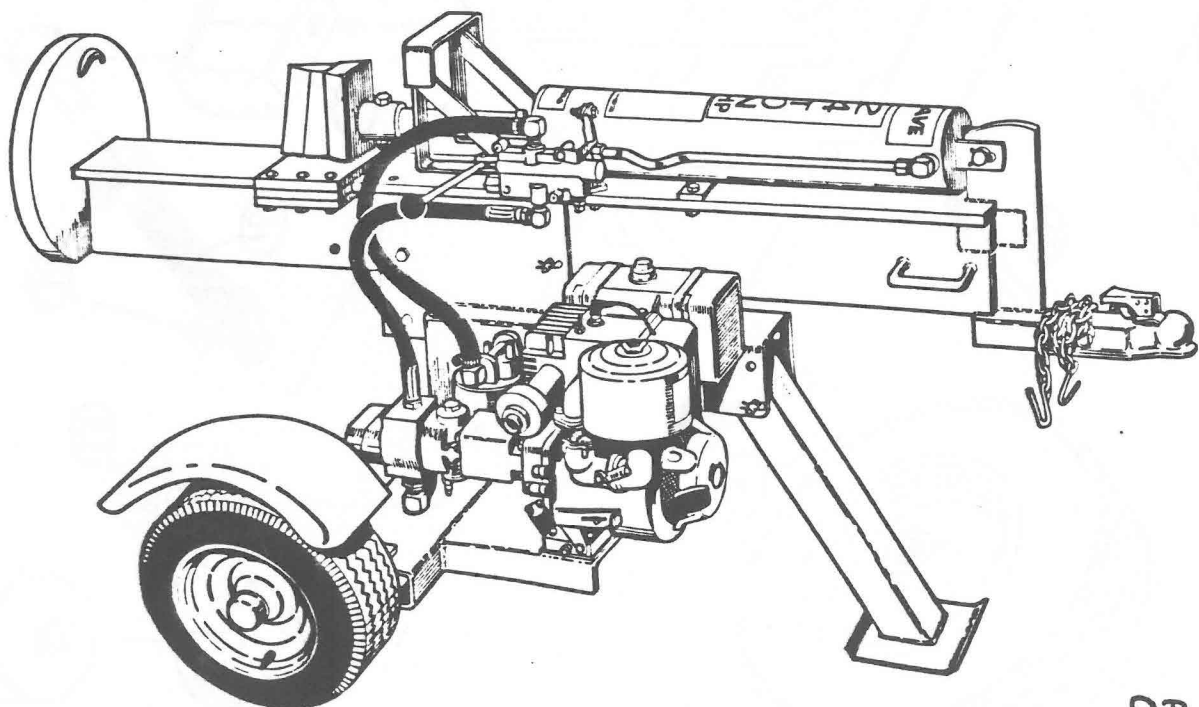
Refer to valve standard features to show how valve handle attaches to valve.

CAUTION: ALWAYS be sure to re-inset the latch rod locking pin (see figure 1, reference #7) when lowering the rail in the tongue assembly for horizontal usage or for towing.

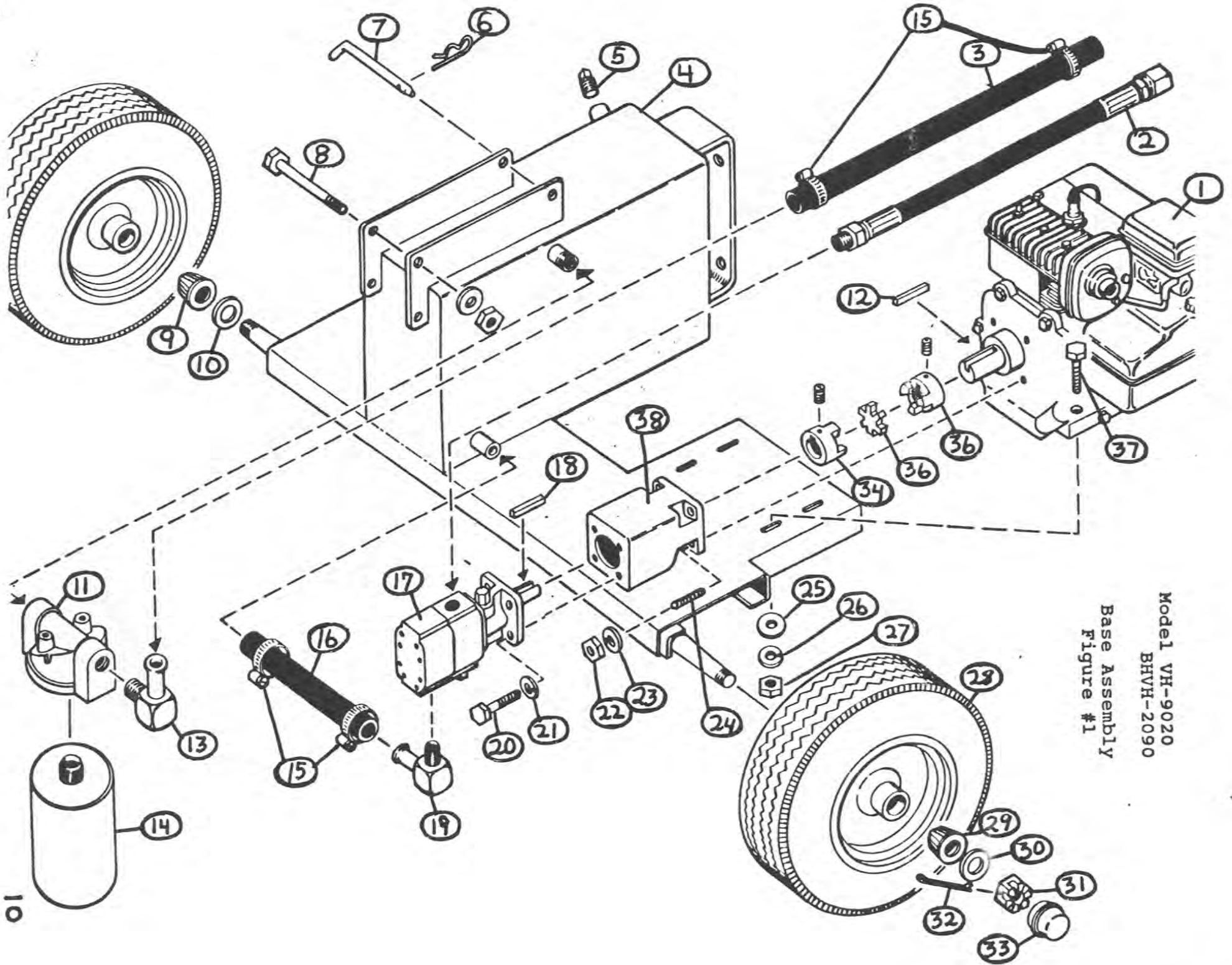
### Step 10

Lower the rail assemble by removing the 1/2" pin into the horizontal position and using the 1/2" pin (previously used in securing the rail in the upright position), then secure the rail to the rail support leg.

Assemble the fenders and oil filter assembly to the rail assembly.







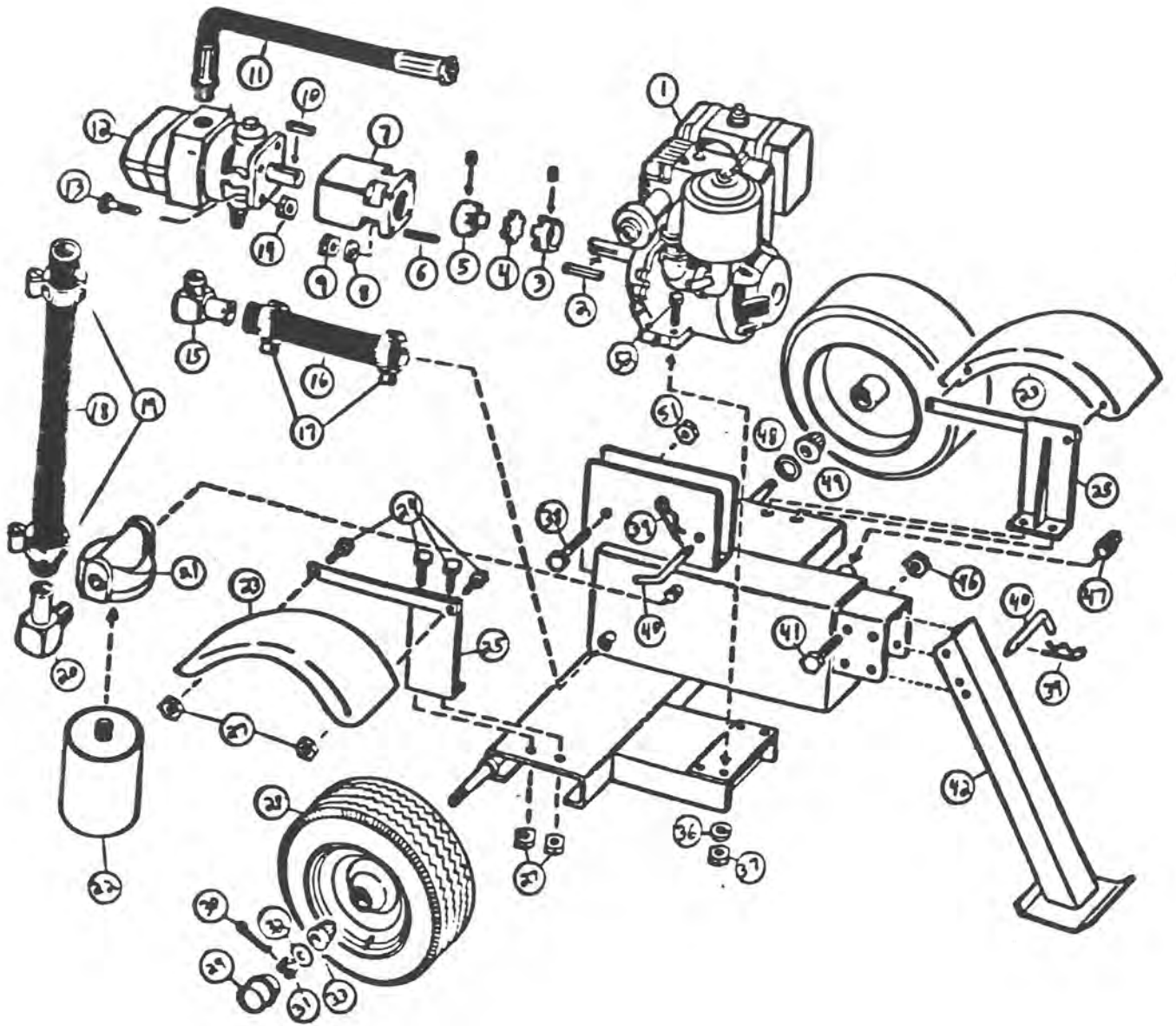
Model VH-9020  
 BHVH-2090  
 Base Assembly  
 Figure #1

MODEL VH9020

BASE ASSEMBLY  
(Figure #1)

Parts List

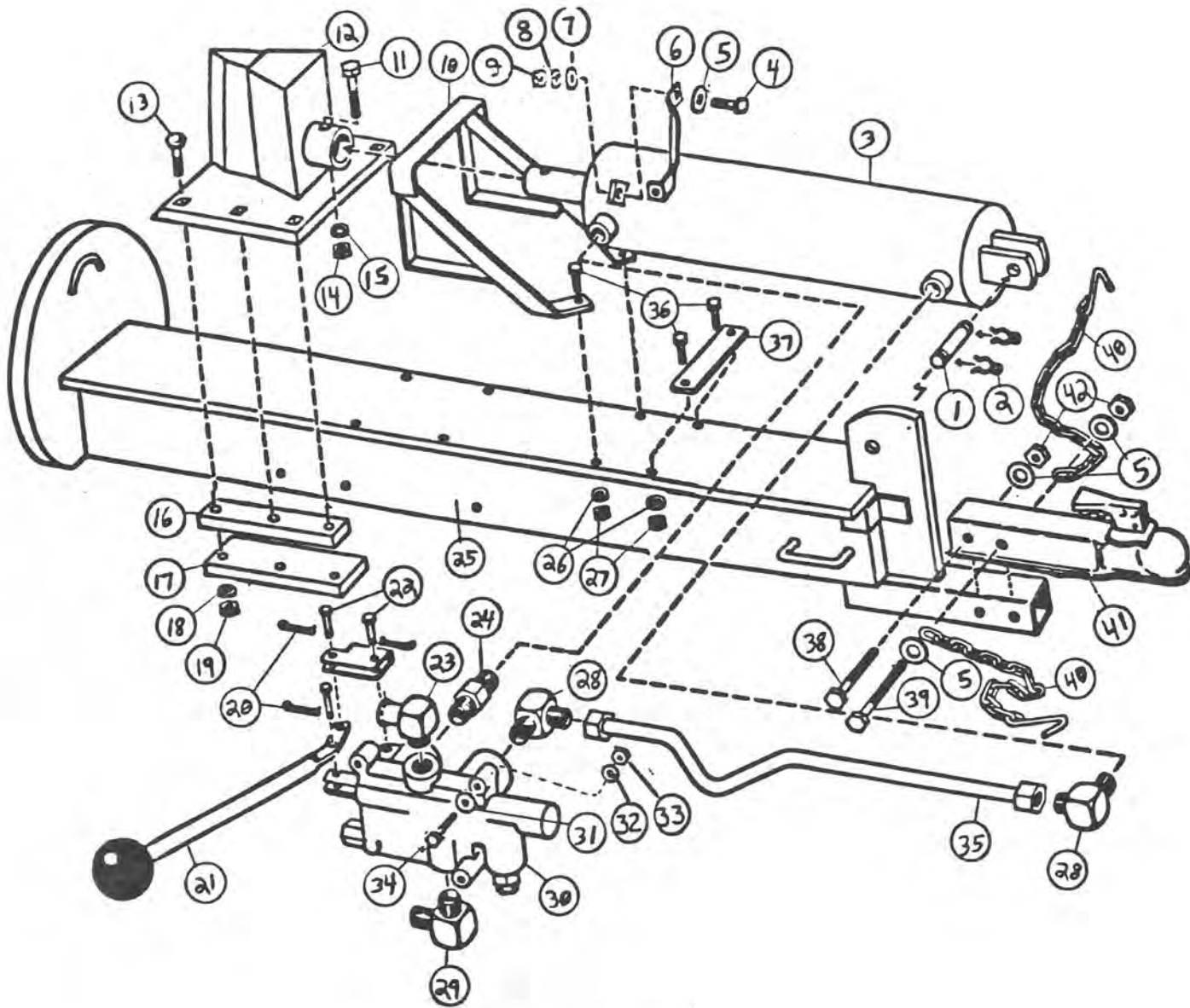
<u>Ref. #</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
1	003005	5 H.P. Engine	1
2	005046	High Pressure Hose 27"L	1
3	005044	Return Hose 3/4" x 33"	1
4	021203	Base - Tank Weldment	1
5	001019	Pipe Plug	1
6	001761	Hair Pin Clip	1
7	001800	1/2" x 4-1/2" Bent Pin	1
8	001247	1/2"-20NF x 4-1/2" Hex Head Bolt GR5	1
9	008301B	Inside Seal	2
10	008301A	Inside Bearing	2
11	001112	Oil Filter Housing	1
12	010104	Engine Key 3/16" x 1"	1
13	001011	Elbow Fitting 90 Degree (12 x 12)	1
14	001111	Oil Filter	1
15	005001	Hose Clamp 3/4" (#12)	4
16	005015	Inlet Hose 3/4" x 6"	1
17	002001M	Pump	1
18	002003	Woodruff Key	1
19	001011	Elbow Fitting 90 Degree (12 x 12)	1
20	001223	5/16"-18NC x 5-1/2" Hex Head Bolt GR2	1
21	001402	5/16" Lock Washer	2
22	001215	5/16"-24NF Hex Nut	4
23	001402	5/16" Lock Washer	4
24	001214	5/16"-24NF x 1-1/2" Threaded Stud	4
25	001401	5/16" Flat Washer	4
26	001402	5/16" Lock Washer	4
27	001303	5/16"-18NC Hex Nut	4
28	008301	Tire & Hub	2
29	008301C	Outside Bearing	2
30	008301D	Thrust Washer	2
31	008301E	Spindle Nut	2
32	008301F	Cotter Pin	2
33	008301G	Dust Cap	2
34	006002A	Coupling 7/16" (Pump End)	1
35	006002B	Urethane Spider	1
36	006002C	Coupling 3/4" (Engine End)	1
37	001212	5/16"-18NC x 1-3/4" Hex Head Bolt GR2	4
38	020010	Engine Flange	1



MODEL VH-9024

BASE ASSEMBLY

FIGURE 01



MODEL VH-9024  
 RAIL ASSEMBLY  
 FIGURE #2

## MODEL VH9020

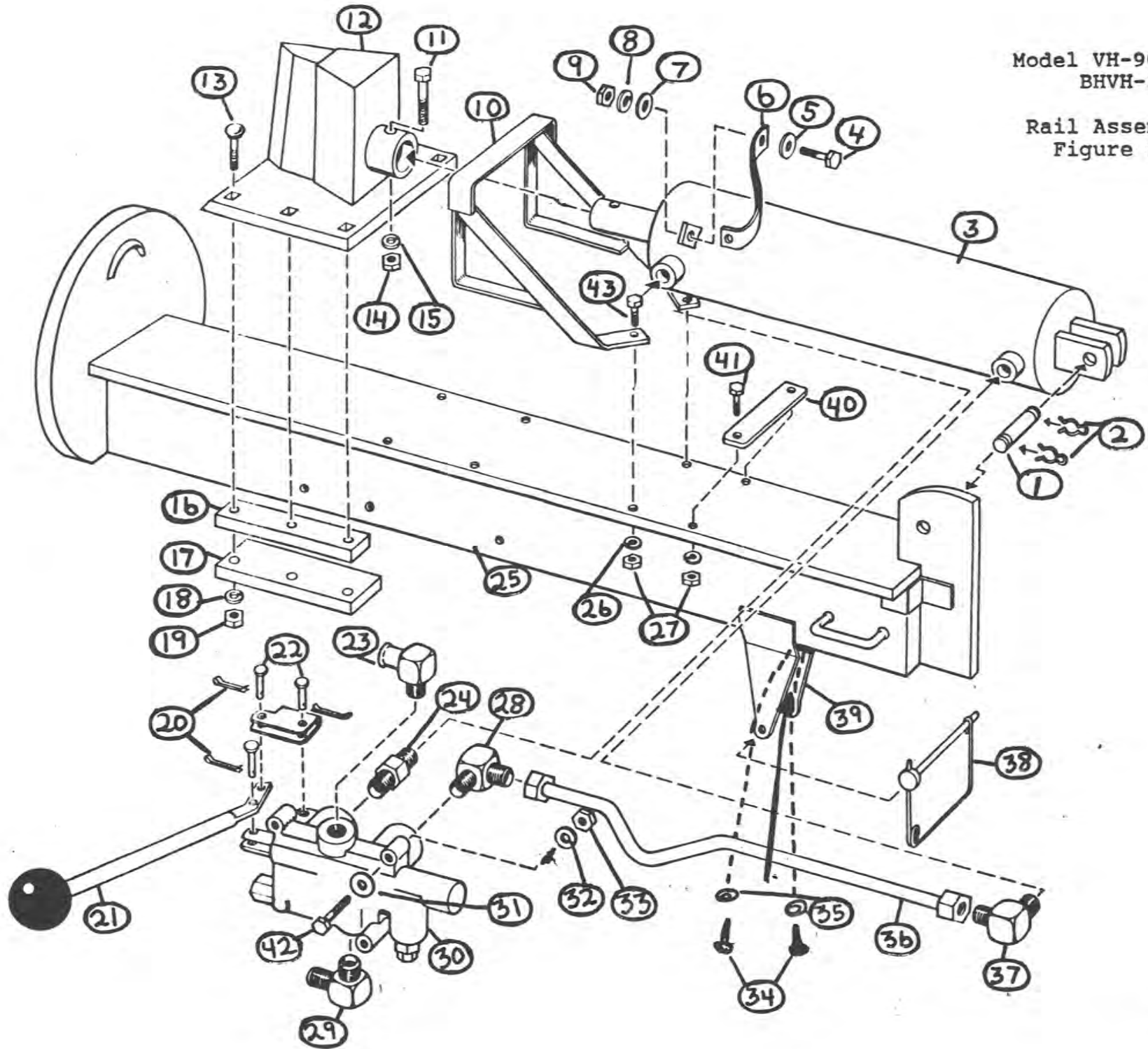
RAIL ASSEMBLY  
(Figure #2)Parts List

<u>Ref. #</u>	<u>Part #</u>	<u>Description</u>	<u>Qty.</u>
1	008513A	Clevis Pin	1
2	001705	Hair Pin Clip	2
3	004057	4" Cylinder	1
4	001206	3/8"-16NC x 1-1/4" Hex Head Bolt GR5	1
5	001400	3/8" Flat Washer	1
6	014085	Valve Strap	1
7	001400	3/8" Flat Washer	1
8	001403	3/8" Lock Washer	1
9	001302	3/8"-16NC Hex Nut	1
10	021168	Stripper	1
11	001244	1/2"-13NC x 4" Hex Head Bolt GR5	1
12	021163	Slide Weldment	1
13	001275	1/2"-13NC x 2-1/4" Carriage Bolt GR5	6
14	001304	1/2"-13NC Hex Nut	1
15	001404	1/2" Lock Washer	1
16	014068	Slide Guide	1
17	014101	Slide Retainer	1
18	001404	1/2" Lock Washer	6
19	001304	1/2"-13NC Hex Nut	6
20	004102H	Cotter Pin	2
21	004102B	Valve Handle	1
22	004102G	Shoulder Pin	3
23	001011	90 Deg. Valve Outlet Fitting (12 x 12)	1
24	001052	1/2" x 2-1/2" Str. Male Connector	1
25	021200	Rail Weldment	1
26	001404	1/2" Lock Washer	4
27	001304	1/2"-13NC Hex Nut	4
28	004002K	90 Degree Elbow Fitting (8 x 8)	1
29	001017	High Pressure Fitting 90 Deg. (10 x 12)	1
30	004102	Valve	1
31	001401	5/16" Flat Washer	1
32	001402	5/16" Lock Washer	1
33	001302	5/16"-18NC Hex Nut	1
34	001246	3/8"-16NC x 3/4" Hex Head Bolt	2
35	001403	3/8" Lock Washer	2
36	004103	Hydraulic Tubing	1
37	004002K	90 Degree Elbow Fitting (8 x 8)	1
38	001491	5/16" x 3-1/2" Snap Lock Pin	1
39	011201	Rail Lock	2
40	011202	Stroke Stop Bar	1
41	001208	1/2"-13NC x 1-1/2" Hex Head Bolt GR5	2
42	001207	5/16"-18NC x 2" Hex Head Bolt GR2	1
43	001208	1/2"-13NC x 1-1/2" Hex Head Bolt GR5	2



Model VH-9020  
BHVH-2090

Rail Assembly  
Figure #2



## MODEL VH-9024

## BASE ASSEMBLY

(Figure #1)

PARTS LIST

<u>REF #</u>	<u>PART #</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	003008	8 H.P. Engine	1
2	010105	Engine Key	1
3	006001C	Coupling 1" (Engine Side)	1
4	006001B	Urethane Spider	1
5	006001F	Coupling 5/8" (Pump Side)	1
6	001214	5/16"-24NF x 1-1/2" Threaded Stud	4
7	020110	Engine Flange	1
8	001402	5/16" Lock Washer	4
9	001215	5/16"-24NF Hex Nut	4
10	002003	Woodruff Key	1
11	005047	High Pressure Hose 28"L	1
12	002002M	16 Gallon Pump	1
13	001206	3/8"-16NC x 1-1/4" Hex Head Bolt GR5	4
14	001301	3/8"-16NC Lock Nut	4
15	001008	Elbow Fitting 90 Degree 16-16	1
16	005015	Inlet Hose 1" ID x 6"L	1
17	004999	Hose Clamp 13/16" - 1-1/2" (#16)	2
18	005014	Return Hose 3/4" ID x 29"	1
19	005001	Hose Clamp 11/16" - 1-1/4" (#12)	2
20	001011	Elbow Fitting 90 Degree 12-12	1
21	001112	Oil Filter Housing	1
22	001111	Oil Filter	1
23	007000	Fender	2
24	001209	5/16"-18NC x 3/4"	8
25	021224	Fender Bracket Weldment	2
27	001325	5/16"-18NC Lock Nut	8
28	008301	Tire & Hub	2
29	008301G	Dust Cap	2
30	008301F	Cotter Key	2
31	008301E	Spindle Nut	2
32	008301D	Thrust Washer	2
33	008301C	Outside Bearing	2
36	001402	5/16" Lock Washer	4
37	001303	5/16"-18NC Hex Nut	4
38	001247	1/2"-20NF x 4-1/2" Hex Head Bolt GR5	1
39	001761	Hair Pin Clip	2
40	001800	1/2" x 4-1/2" Bent Pin	2
41	001244	1/2"-13NC x 4" Hex Head Bolt GR2	1
42	021225	Front Leg Weldment	1
46	001304	1/2"-13NC Lock Nut	1
47	001019	Pipe Plug	1
48	008301A	Inside Bearing	2
49	008301B	Inside Seal	2
51	001320	1/2"-20NF Lock Nut	1
52	001212	5/16"-18NC x 1-3/4" Hex Head Bolt GR2	4



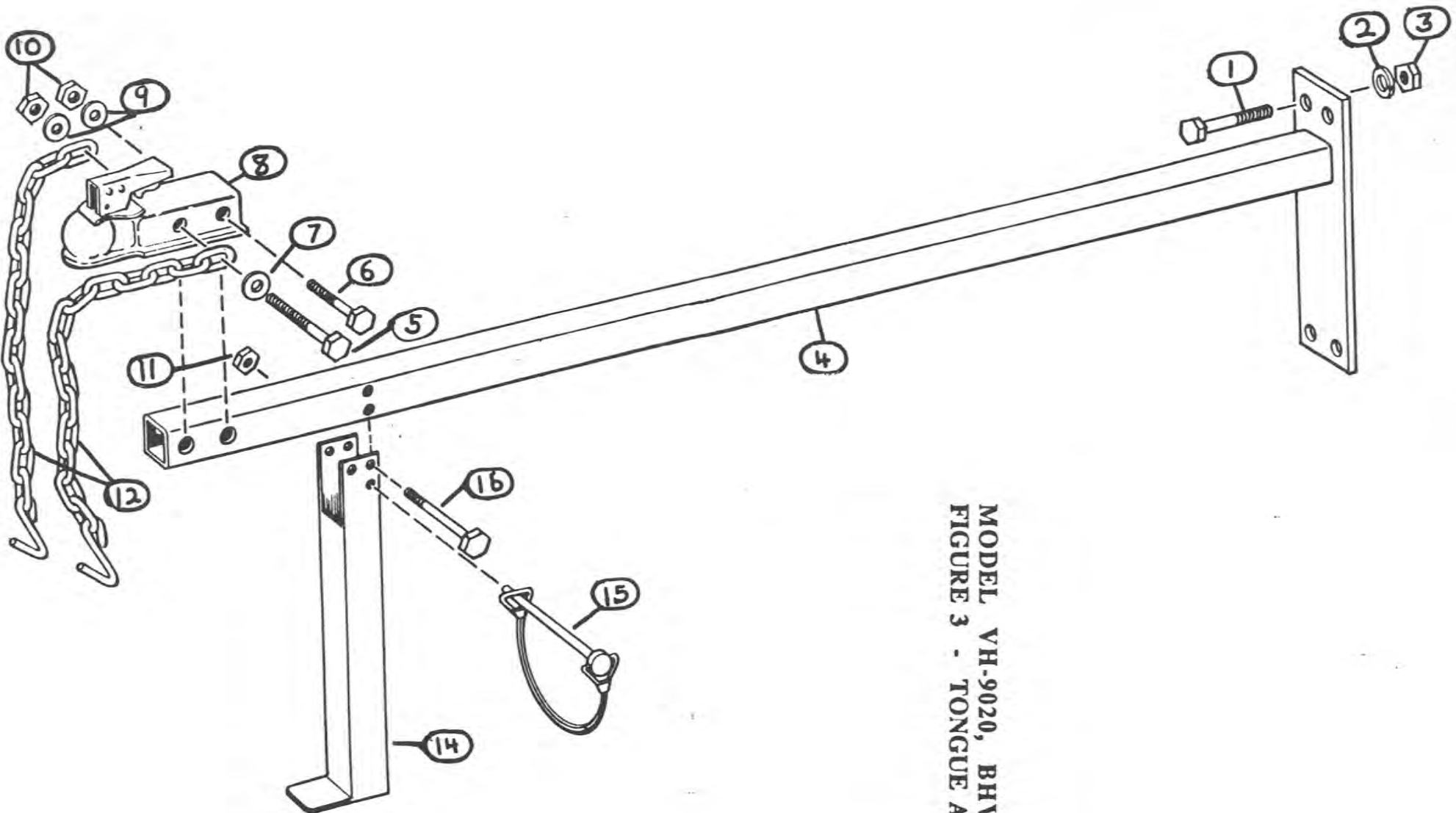
MODEL VH-9024

RAIL ASSEMBLY

(Figure #2)

PARTS LIST

<u>REF #</u>	<u>PART #</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	008513A	Clevis Pin	1
2	001705	Hair Pin Clip	2
3	004056	4-1/2" Cylinder	1
4	001206	3/8"-16NC x 1-1/4" Hex Head Bolt GR5	1
5	001400	3/8" Flat Washer	4
6	014085	Valve Strap	1
7	001400	3/8" Flat Washer	1
8	001403	3/8" Lock Washer	1
9	001302	3/8"-16NC Hex Nut	1
10	021168	Stripper Weldment	1
11	001197	1/2"-13NC x 3" Hex Head Bolt GR5	1
12	021163	Slide Weldment	1
13	001275	1/2"-13NC x 2-1/4" Carriage Bolt GR5	6
14	001304	1/2"-13NC Hex Nut	1
15	001404	1/2" Lock Washer	1
16	014068	Slide Guide	2
17	014101	Slide Retainer	2
18	001404	1/2" Lock Washer	6
19	001304	1/2"-13NC Hex Nut	6
20	004102H	Cotter Pin	2
21	004102B	Valve Handle	1
22	004106	Shoulder Pin	3
23	001011	90 Degree Valve Outlet Fitting 12-12	1
24	001052	1/2" x 2-1/2" STR Male Connector	1
25	021220	Rail Weldment	1
26	001404	1/2" Lock Washer	4
27	001304	1/2"-13NC Hex Nut	4
28	004002K	90 Degree Elbow Fitting 8-8	1
29	001017	High Pressure Fitting 90 Degree 10-12	1
30	004102	Valve	1
31	001401	5/16" Flat Washer	1
32	001402	5/16" Lock Washer	1
33	001302	5/16"-18NC Hex Nut	1
34	001207	5/16"-18NC x 2" Hex Head Bolt GR2	1
35	001403	Hydraulic Tubing	1
36	001208	1/2"-13NC x 1-1/2" Hex Head Bolt GR5	4
37	011202	Stroke Stop Bar	1
38	001218	3/8"-16NC x 3" Hex Head Bolt GR5	1
39	001260	3/8"-16NC x 3-1/2" Hex Head Bolt GR5	1
40	008508	Safety Chain w/S Hook	2
41	008501	Hitch Coupler w/1-7/8" Ball	1
42	001301	3/8"-16NC Lock Nut	2



MODEL VH-9020, BHVH-2090,  
FIGURE 3 - TONGUE ASSEMBLY



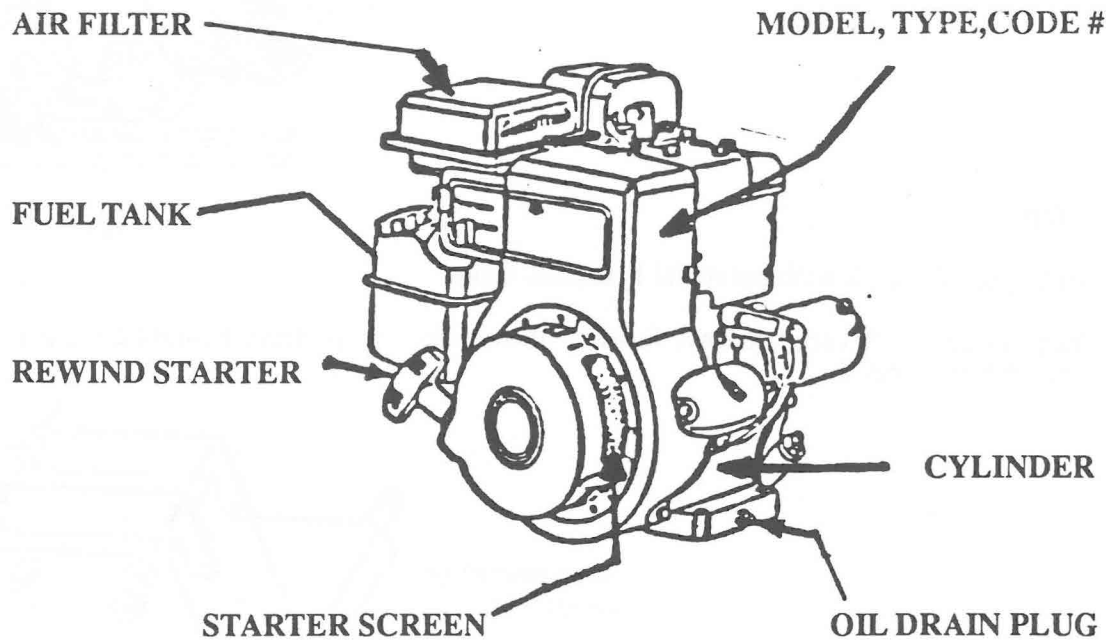
**MODEL VH-9020, BHVH-2090,  
FIGURE 3 - TONGUE ASSEMBLY**

**(PARTS LIST):**

<b>REF. NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>	<b>QTY</b>
1	001208	1/2"-13 X 1-1/2" NC hex head bolt gr 5	4
2	001404	1/2" lock washer	4
3	001304	1/2" -13 NC hex nut	4
4	021204	tongue	1
5	001260	3/8"-16 NC x 3-1/2" hex head bolt gr5	1
6	001218	3/8"-16 NC x 3" hex head bolt gr5	1
7	001400	3/8" flat washer	1
8	008501	hitch coupler w/ 1-7/8" ball	1
9	001400	3/8" flat washer	2
10	001301	3/8" -16 NC lock nut	2
11	001325	5/16" -18 self locking nut	1
12	008508	safety chain with s hooks	2
13	011209	jack leg	1
14	0017804	snap pin 5/16" x 2"	1
15	001270	5/16"-18 NC x 3" hex head bolt gr2	1

## IMPORTANT:

**BEFORE STARTING:** Read your engine manufacturers operating and maintenance instructions. Briggs and Stratton engine shown



## NOTE:

This unit is equipped with an internal combustion engine and should not be used on or near any unimproved forest-covered, brush-covered, or grass-covered land unless the engine's exhaust system is equipped with a spark arresting screen, meeting applicable local, state, and federal laws.

In many states (such as California) the above spark arresting screen is required by law (section 4442 of the California Public Resources Code). Federal laws may apply on federal lands.

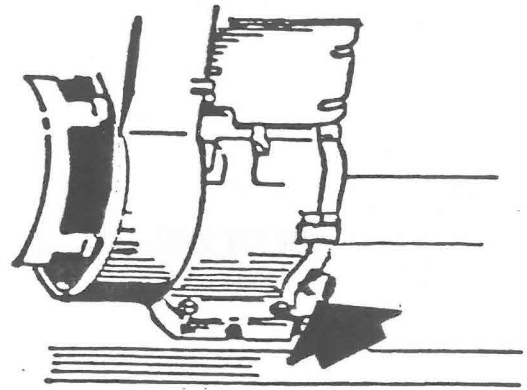
The log splitter you have purchased does have a spark arresting muffler system. Please review the engine owners manual for the proper maintenance of your engine.

## START UP

### Step 1

Fill engine crankcase with oil to the point of overflowing. (See figure 1).

Refer to engine manufacturers owners manual.

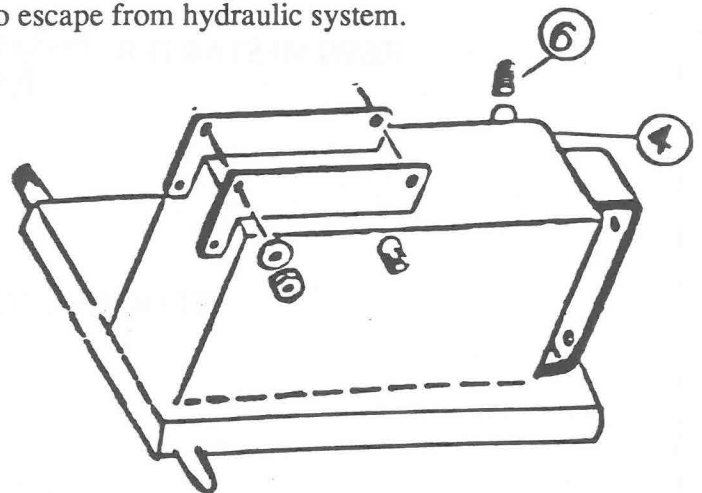


. figure 1

### Step 2

Fill hydraulic tank with universal hydraulic fluid.

Replace reservoir cap, but leave loose to allow air to escape from hydraulic system. (See figure 1, ref. 5).



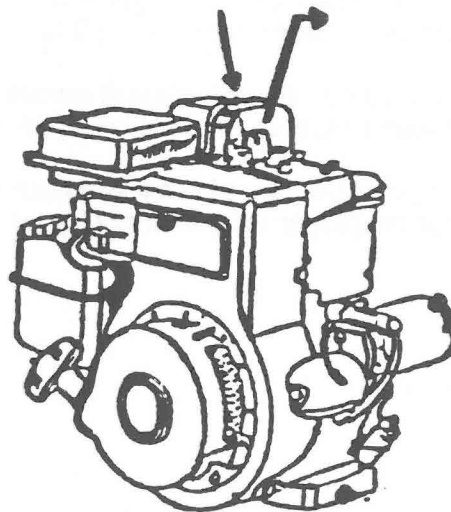
base assembly  
(figure 1)

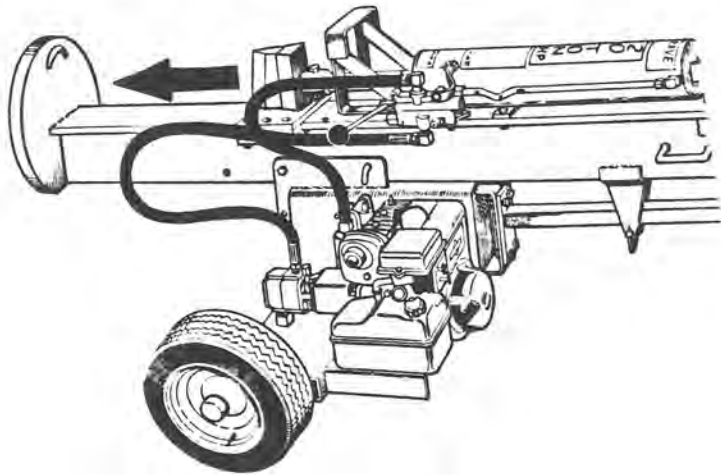
### Step 3

Disconnect spark plug wire from the spark plug,

kill tab  
(figure 4)

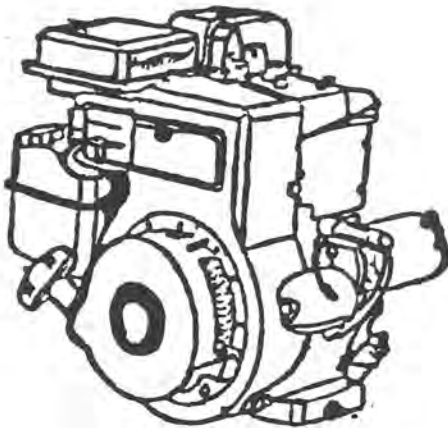
spark plug wire





**VERY IMPORTANT-** While holding control handle, pull engine starting rope several times (15-25) until you see the slide of the beam starting to move forward. This will assure the hydraulic fluid has reached the pump. (See figure 5).

Attach spark plug wire to spark plug.  
Your Log Splitter is now ready to start.



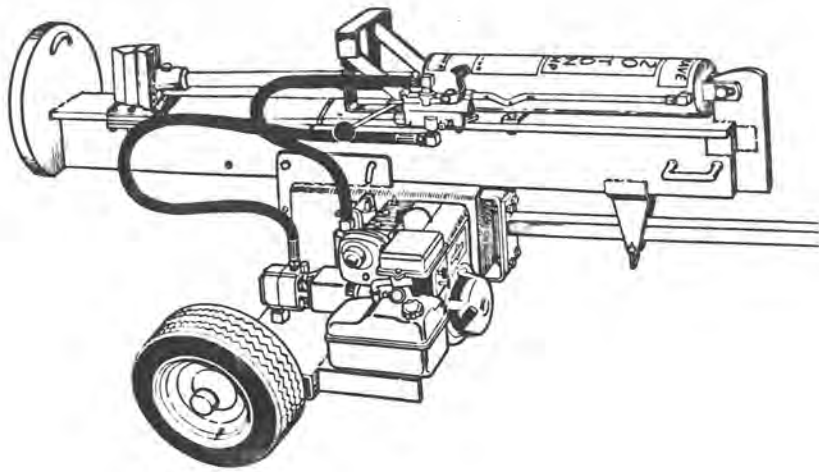
#### Step 5

Fill engine fuel tank with fresh, clean lead free or leaded automotive gasoline. Do not overfill. Should you spill gasoline, allow it to evaporate before continuing.

**IMPORTANT- DO NOT MIX OIL WITH GASOLINE.**

#### Step 6

To start engine, pull choke out. Grasp starter handle and pull rapidly. Repeat if necessary. When engine starts and begins to warm up slowly push choke back in. Once engine is warmed up it may not be necessary to use the choke to restart. To stop engine, flip kill tab against spark plug. (See figure 6).



### Step 7

With engine operating and warmed up, push control level forward in a slow pulsating manner. This should be done until the cylinder rod is approximately two-thirds extended. (See figure 7).

### Step 8

Shut engine off.

### Step 9

Add oil to reservoir tank to within 1" of the top. Replace reservoir cap securely. (See figure 1, reference #5).

### Step 10

RESTART ENGINE.

### Step 11

Push control lever forward until the rod is completely extended. Now pull back on the control lever in the same manner. This will cause the cylinder rod to retract. Repeat this cycle at least four times to make sure all the air is forced out of the system. Stop the rod about 50% extended.

### Step 12

Shut engine off.

### Step 13

Recheck the oil in the reservoir tank. Oil should be approximately 1" from top. If required, add additional oil. Replace oil reservoir cap securely.



**Start up (cont'd)**

**Step 14**

START engine and fully extend ram. Hold control lever fully forward and with a piece of cardboard, check for leaks. Tighten fittings if required.

**Step 15**

Lubricate lower surface of main beam with grease to prevent wear between slide plate and beam.

**YOUR BRAVE LOG SPLITTER IS NOW READY FOR OPERATION !**

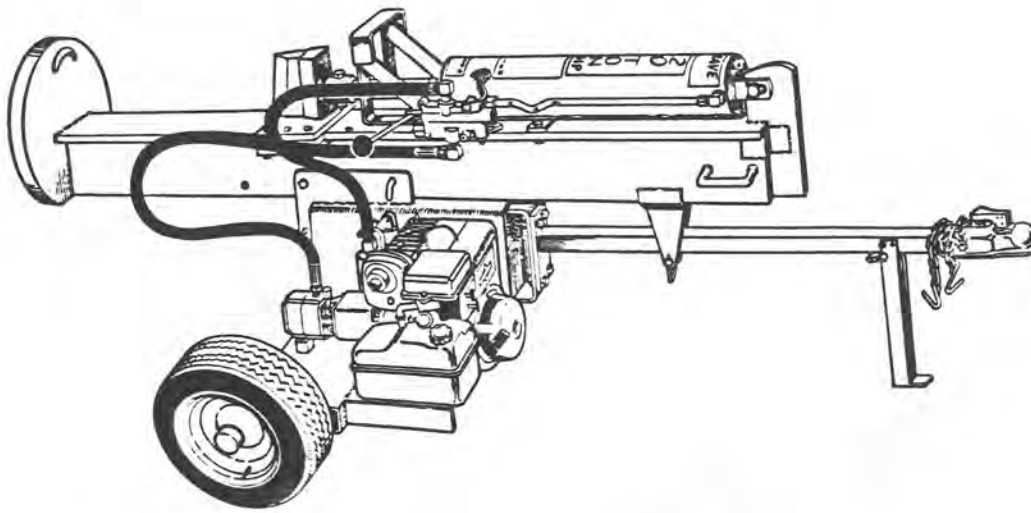


## TRAILER TYPE

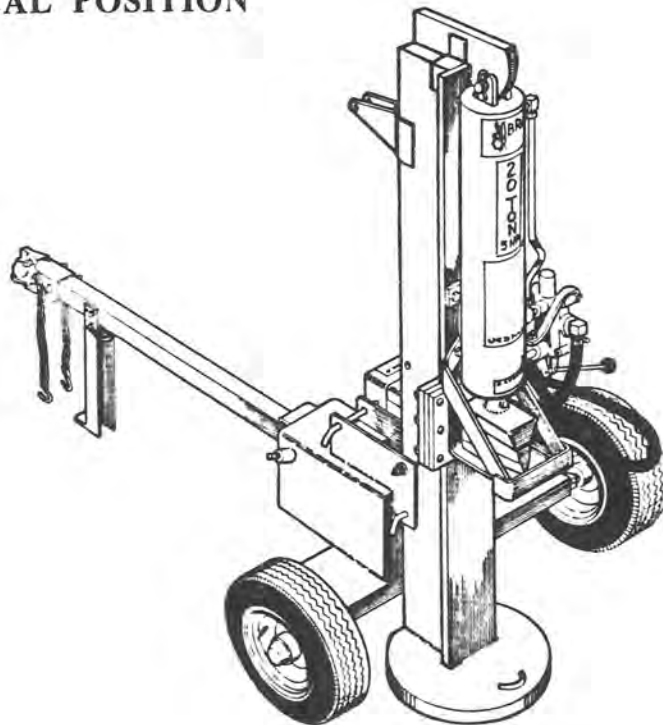
### VERTICAL / HORIZONTAL LOG SPLITTER

MODELS VH-9020 , BHVH-2090

#### HORIZONTAL POSITION



#### VERTICAL POSITION

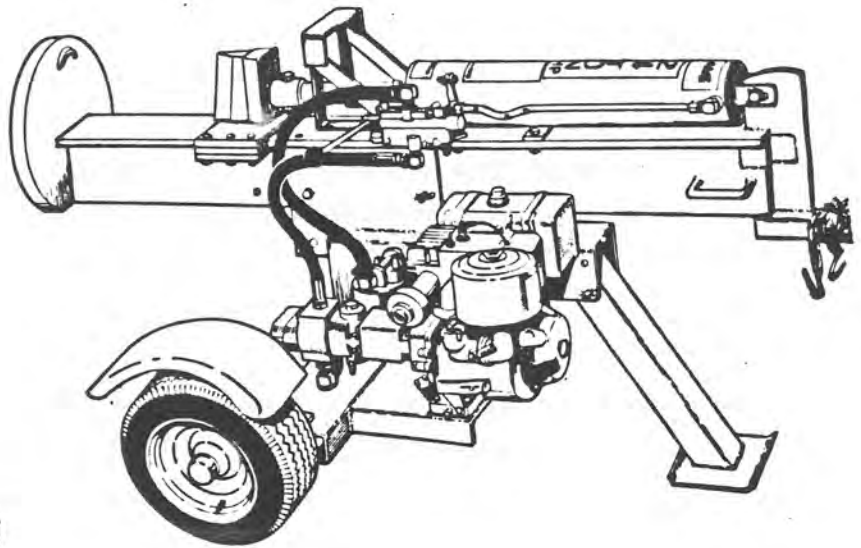


## TRAILER TYPE

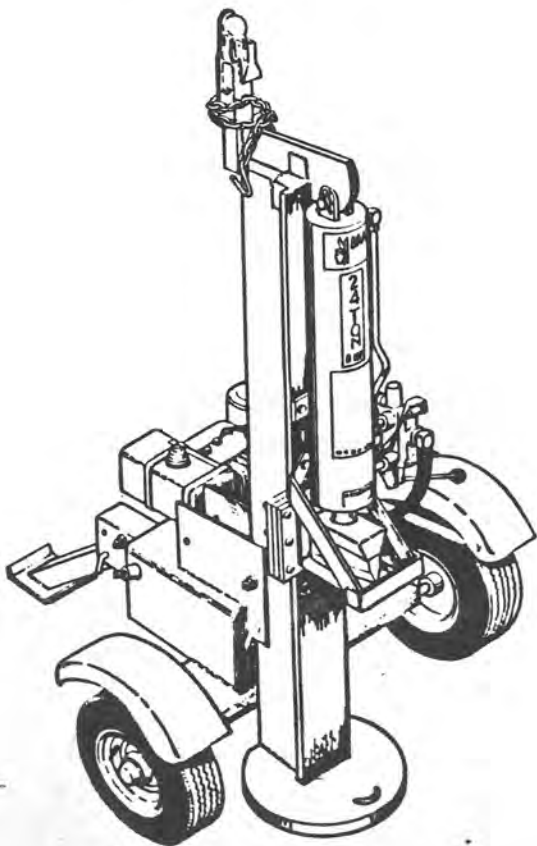
### VERTICAL / HORIZONTAL LOG SPLITTER

MODELS VH-9024 , BHVH-2490

#### HORIZONTAL POSITION



#### VERTICAL POSITION



21 B

## OPERATING INSTRUCTIONS - VERTICAL

### Step 1

Find a level area. Your log splitter should not be operated vertically, or horizontally in a tilted position. Release the beam by pulling the quick release pin. (See figure 2, Reference # 38).

### Step 2

Release the rail by pulling the bent pin (Fig. 1, ref. # 7). The rail can now be lifted into vertical position. Grasp the handle and lift upwards. Put one foot on the tongue to avoid the possibility of it coming up with the rail. (See figure 3).

### Step 3

With the rail in vertical position, step to the front and position bent pin (Item #7) into position. It is located just below the hinge pin. (Figure #1).

### Step 4

Start the engine. Let the engine warm up for a minute or more.

### Step 5

Place the log against the beam between the wedge and the base plate. Center one end of the log with the wedge and the other end with the base plate.

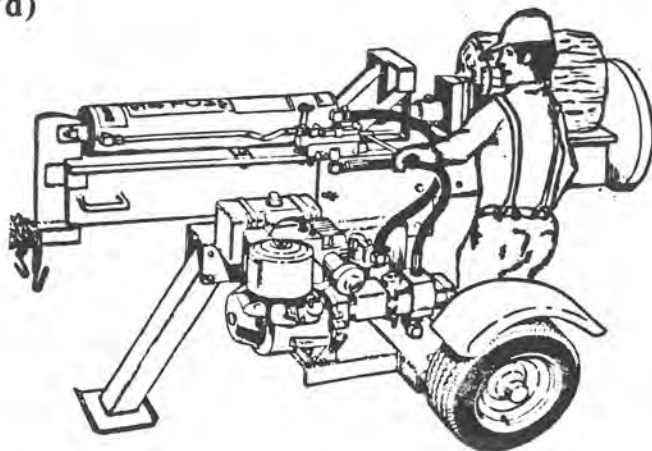
### Step 6

Push down toward the log on the control valve lever. Hold the lever in this position until the log is split or the cylinder rod stops at it's maximum travel point.

## OPERATING INSTRUCTIONS (Cont'd)

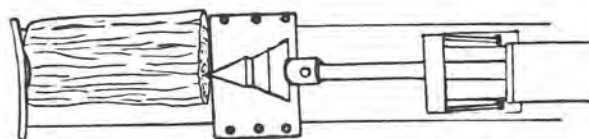
### Step 7

Push forward (toward the log) on the control valve lever. Hold the lever in this position until the log is split or the cylinder rod stops at it's maximum travel point. (See figure 2)



### Step 8

If the cylinder rod is fully extended and log is not completely split, retract cylinder rod by pulling back on the control valve lever. The log will hit the stripper plates and dislodge. Caution: Stand back and to the side in the event the log would fall.



For logs larger than 16 inches in diameter, split approximately one-third or less of the cross section at a time. (See figure 3).



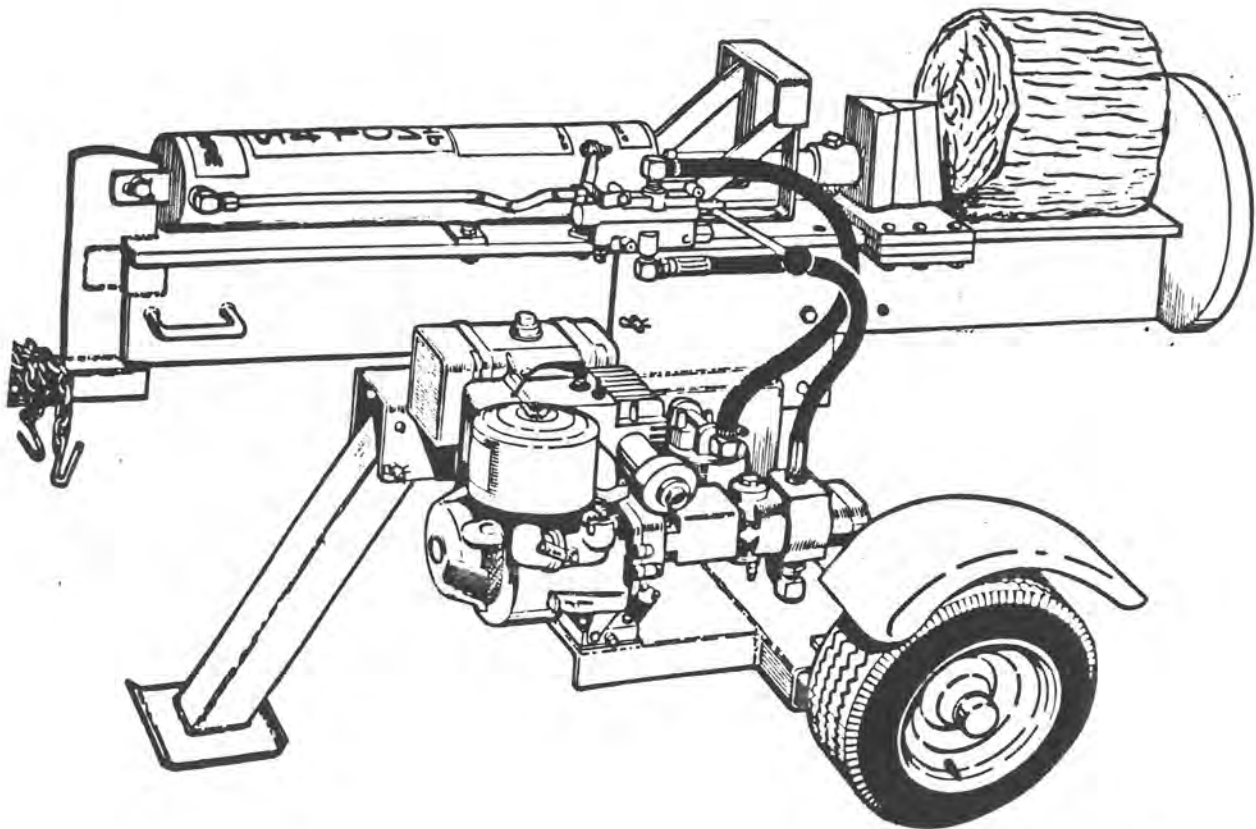
- **Note:** For your safety, when the lever is released it will automatically return to the center or "hold" position and the cylinder rod travel automatically stops.

## OPERATING INSTRUCTIONS - VERTICAL (CONT'D)

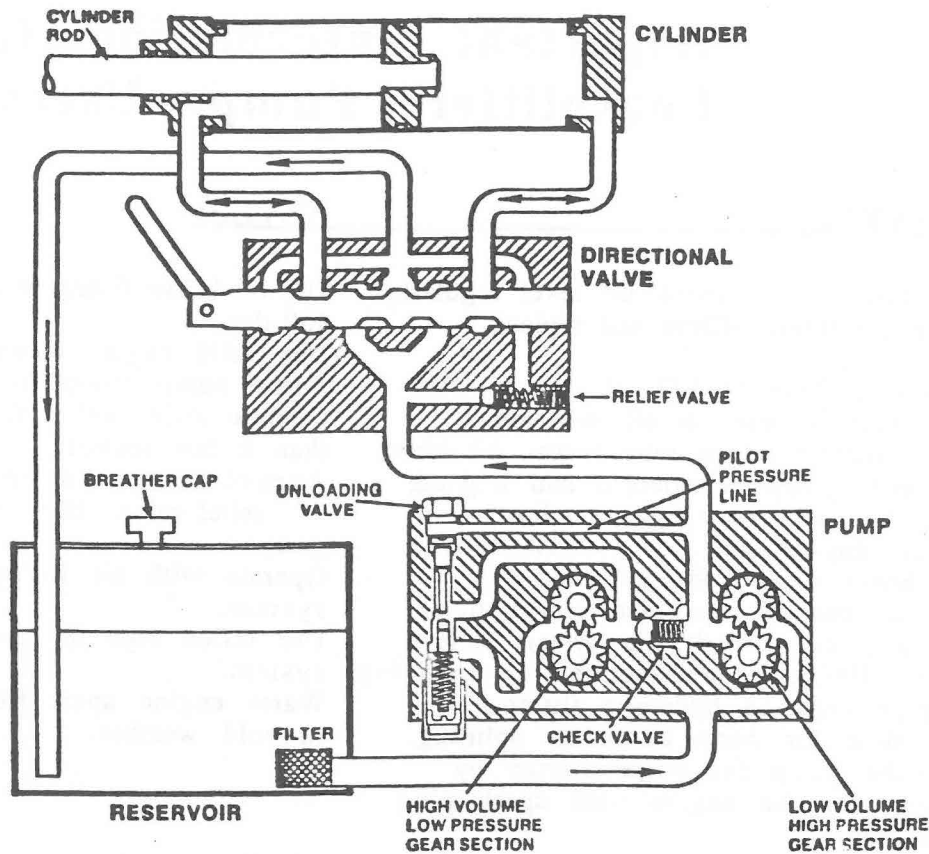
### Step 9

If the cylinder rod is fully extended and the log is not completely split and is lodged on the wedge, it can be removed by simply pulling back on the handle and retracting the rod into the cylinder. This will bring the log against the splitter plates which will push the log off the wedge.

**Caution:** Stand back and to one side to avoid injury when the log drops.







## The Pump

A two-stage logsplitter pump has one large and one small gear section, using common inlet and outlet ports. Below a preset pressure (called unloading pressure) a check valve between the two gear sections allows both flows to combine. Together, the two gear sections create a large volume flow which produces rapid cylinder movement under low load conditions.

Above unloading pressure, a pilot pressure line (which simulates actual pressure at the cylinder) activates the unloading valve, which causes the flow to bypass the large gear section and return to the pump inlet area. The small gear section is now operating alone, and will generate the higher pressure necessary for the actual logsplitting operation.

The original factory setting for the unloading valve is designed to provide maximum flow while remaining below engine stalling load. **Please note: Splitting capability is not affected by the setting of the unloading valve. Do not attempt to adjust or reset it without a pressure gauge.**

## The Directional Valve and Cylinder

From the pump, oil flows to a four way, three position directional valve. At the neutral position this valve directs the flow back to the oil reservoir, bypassing the cylinder. When the directional valve is directing the flow to the back of the cylinder, the cylinder rod extends quickly until it meets significant resistance. Upon reaching unloading

pressure, movement of the shaft will slow but will continue forward. If the pressure reaches a preset maximum (called relief valve pressure) the relief valve, located within the directional valve, will allow the flow to bypass the cylinder and return to the reservoir. This can happen when the cylinder rod meets excessive resistance, or when it reaches the end of its stroke and can move no farther. **Please note: Never operate at relief valve pressure for more than a few seconds.**

When the directional valve is directing the flow to the front of the cylinder, the rod will retract quickly since it is encountering no resistance. The relief valve will momentarily bypass the flow at the end of the return stroke but the directional valve should then automatically return to the neutral position, directing the flow directly into the reservoir. This serves to protect the pump from possible damage due to prolonged operation at relief valve pressure.

Because of the potential for system damage, the relief valve is carefully and precisely preset by the manufacturer. **Please note: The user should not attempt to adjust or change the setting of the relief valve without a pressure gauge.**

## Operational Problems

If you have trouble with your logsplitter, please refer to the Troubleshooting Guide on this sheet. If you have any doubt about the cause of a malfunction, return the suspected component to your dealer or distributor. **Please note: Readjustment of valves or disassembly of pump voids all pump warranties.**

# Important Information for Logsplitter Pump Users!

## ALWAYS:

Use clean oil and check oil level regularly.  
Use an oil filter. Clean and replace.

Use Dextron Type 11 ATF oil  
Use a breather cap on oil reservoir.  
Keep reservoir return tube below oil level.  
Make sure pump is mounted and aligned.  
Use a flexible spider type coupling between engine and pump driveshafts.  
Keep hoses clear and unblocked.  
Bleed air out of hoses before operating.  
Flush and clean hydraulic system before startup after any malfunctions or servicing.  
Use pipe caps on hydraulic fittings.  
Allow time for warm up before splitting.  
Prime the pump for initial startup by turning over the engine with spark plug disconnected.

## NEVER:

Use oil below 0 deg. F or above 150 deg. F.  
Use solid engine pump coupling  
Force pump when mounting  
Operate relief valve for more than a few seconds.  
Attempt to reset unloading or relief valve without pressure guages.  
Operate with air in hydraulic system.  
Use teflon tape on hydraulic system.  
Warm engine apart from pump in cold weather.

## LOG SPLITTER TROUBLE SHOOTING GUIDE

### PROBLEM

Cylinder rod will not move.  
See A,C,E,O,Q,R,U,V

Slow cylinder shaft speed while extending and retracting.  
See E,J,L,O,R,S,T,X,

Engine runs but wood will not split or wood splits too slowly.  
See D,H,J,M,R,S,T,W,X

Engine stalls while splitting  
See K,N,P,W

Leaking pump shaft seal  
See A,B,E,G,I,

Engine will not turn or stalls under low load conditions.  
See B,F,K,Q,V.

### PROBABLE CAUSE / ACTION

- A. Broken drive shaft / return pump for authorized repair.
- B. Engine pump misalignment/ correct alignment as necessary.
- C. Loose shaft coupling/ correct engine pump alignment.
- D. Small gear section damaged/ return pump for authorized repair
- E. Gear sections damaged/ return pump for authorized repair.
- F. Frozen or seized pump/ return pump for authorized repair.
- G. Poorly positioned shaft seal/ return pump for authorized repair
- H. Pump check valve leaking/ return pump for authorized repair
- I. Plugged oil breather/ make sure reservoir is properly vented.

- J. Excessive pump inlet vacuum/ make sure pump inlet hoses are clear and unblocked; use short wide diameter inlet hoses.
- K. Low horsepower/ weak engine-/ Return engine for authorized repair.
- L. Slow engine speed/ Return engine for authorized repair.
- M. Low relief valve setting / only adjust valve while using pressure gauge.
- N. High relief valve setting / only adjust valve while using pressure gauge.
- O. Damaged relief valve / return directional valve for authorized repair.
- P. High unloading valve setting/ Only adjust valve while using pressure gauge.
- Q. Hydraulic lines blocked/ flush and clean hydraulic system.
- R. Too little oil to pump/ add oil to reservoir.
- S. Air in oil/ Add oil, clean reservoir, make sure oil return tube is below oil level.
- T. Directional valve leaking internally/ return directional valve for authorized repair.
- U. Damaged directional valve/ return directional valve for authorized repair.
- V. Blocked directional valve/ flush and clean hydraulic system, return directional valve for authorized repair.
- W. Overloaded cylinder/ do not attempt to split wood against the grain.
- X. Internally damaged cylinder/ return cylinder for authorized repair.



## VALVE STANDARD FEATURES DESCRIPTIONS

### PRESSURE RELEASE DETENT, SPRING CENTER TO NEUTRAL

This feature provides a pressure release detent for the spool 'out' (handle in) position. When the spool is manually placed in the detent position oil is directed to the 'B' work port ( the port away from the handle) When the pressure in the 'B' port reaches a preset level the detent will release and the spool will center. The detent release pressure is adjustable by removing the acorn nut and jam nut, items 16 and 17, and turning the adjusting screw, item 13. Turning the adjusting screw clockwise will increase the detent release pressure and counterclockwise will decrease the pressure. **Note: If the detent release pressure is adjusted too high the spool will not center, if the pressure is too low the detent will not hold.**

### RELIEF VALVE

An adjustable ball spring relief valve is standard on all LS-3000 valves. The standard factory setting is 2250 psi @ 3 gpm and 120 deg. F. Other settings can be specified.

The relief pressure is adjusted by removing the acorn nut, item 22, and turning the adjusting screw, item 20. Turning the adjusting screw clockwise will increase the pressure and counterclockwise will decrease the pressure ( a pressure gauge must be installed in the inlet line when ever the relief pressure is adjusted).

## SYSTEM OIL CHANGE

**NOTE: NEVER RUN DRY PUMP!!**

1. Run ram completely forward.
  - A. Disconnect rear pressure hose from control.
  - B. Position hose over empty container.
  - C. Return ram completely to rear position. (This will drain rear of cylinder).
  - D. Reconnect rear pressure hose to control.
2. Disconnect pump inlet hose and drain into container.
3. Disconnect front cylinder pressure hose.
  - A. Position empty container under fitting.
  - B. Fill reservoir with new oil (Use hydraulic fluid 10W anti-foam)
  - C. Run ram forward 1/2 way.
  - D. Refill reservoir tank.
  - E. Complete forward ram movement. (This will drain front of cylinder completely.)
  - D. Replace reservoir's cap completely (Tighten, back off 2 turns).
4. Return ram to back of stroke.
5. Fill reservoir to within 1-1/2" from top of cap. Replace cap loosely.
6. Cycle unit several times to remove air from system.
7. Recheck reservoir to make sure oil is filled to within 1-1/2" from top of cap.
8. Retighten reservoir cap. Unit is now ready for use.

## STORAGE INSTRUCTIONS

Engines to be stored over 30 days should be completely drained of fuel to prevent gum deposits forming on essential carburetor parts, fuel filter, fuel lines and tank.

- A. All fuel should be removed from fuel tank. Run the engine until it stops from lack of fuel. The small amount of remaining fuel should be absorbed with a clean dry cloth.





# **BRAVE INDUSTRIES, INC.**

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Phone (309) 935-6131  
FAX (309) 935-6522

## **WARRANTY**

**BRAVE INDUSTRIES, INC.** warrants your Brave Log Splitter to be free from defects in material and workmanship during normal homeowner use for a period of one year from date of purchase. For commercial use the warranty period is for 30 days from date of purchase. Any parts found to be defective within the warranty period will be repaired or replaced at no charge except for any transportation charges which are the obligation of the purchaser.

This warranty shall not cover any parts which are found to be defective because of negligence, accident, alteration, abuse, misuse, misapplication or improper maintenance. This warranty does not cover normal wear and tear items, which through normal usage, may wear or may have to be replaced during normal usage. The engine manufacturer warrants the engine as outlined in the enclosed engine manual. Read the engine manual completely prior to servicing and/or operating your machine.