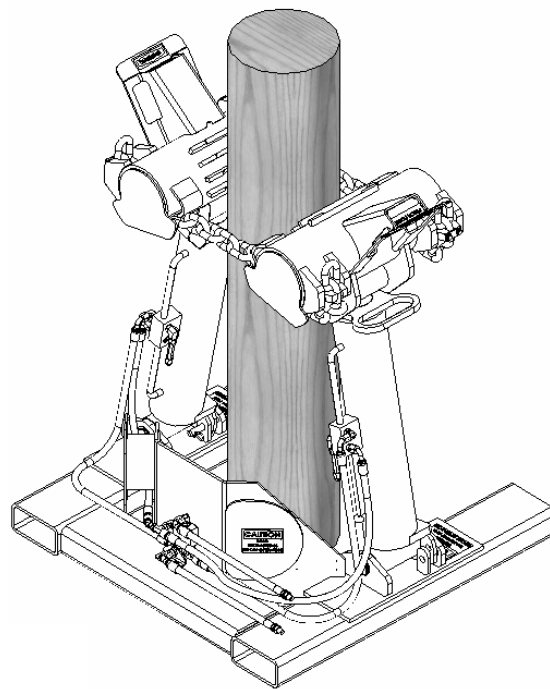


INSTRUCTION MANUAL

DIVERSIFIED

• P R O D U C T •

DEVELOPMENT



XHD-60

Dual Cylinder

Pole Puller



Read and understand all of the instructions and safety information in this manual before operating or servicing this piece of equipment.

Introduction

This manual has been compiled to assist you in properly operating and maintaining your Diversified Pole Puller.

Before placing the pole puller in service, all operators and persons working around the equipment must thoroughly read and understand the contents of the manual pertaining to **Safety, Operation and Maintenance**. Before moving the pole puller, information relating to transporting the pole puller must be read and observed.

The manual must be retained with the pole puller for use by subsequent operating personnel.

Information in this manual does not replace federal, state or local regulations, safety codes or insurance requirements.

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Description

The Diversified Product Development XHD-60 Dual Cylinder Pole Puller is a high capacity, hydraulic powered piece of equipment for pulling utility poles up to 28” diameter with a force of up to 62 tons. It can be set up by one person and grips the pole with cam-action heads.

Featuring built-in fork pockets, lifting points and high strength alloy chains, the pole puller may be used with open-center or closed-center hydraulic systems.

Safety

Safety is essential in the use and maintenance of this Diversified equipment. This manual and any markings on this piece of equipment provide information for avoiding hazards and unsafe practices related to the use of this equipment. Observe all of the safety information provided.

Purpose of this Manual

This manual is intended to familiarize all personnel with the safe operation and maintenance procedures for the following Diversified piece of equipment:

XHD-60 Dual Cylinder Pole Puller (61375)

Keep this manual available.

Replacement manuals are available for download.

Other Publications


SAE Standard J1273 (Hose and Hose Assemblies)

All specifications are nominal and may change as design improvements occur. Diversified Product Development shall not be liable for damages resulting from misapplication or misuse of its products.


KEEP THIS MANUAL

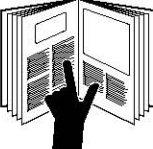
IMPORTANT SAFETY INFORMATION


	<p style="text-align: center;">SAFETY ALERT SYMBOL</p> <p>This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.</p>
<p>⚠ DANGER</p>	
<p>Immediate hazards which, if not avoided, WILL result in severe injury or death.</p>	
<p>⚠ WARNING</p>	
<p>Hazards which, if not avoided, COULD result in severe injury or death.</p>	
<p>⚠ CAUTION</p>	
<p>Hazards or unsafe practices which, if not avoided, MAY result in injury or property damage.</p>	

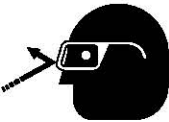
	<p style="text-align: center;">⚠ WARNING</p> <p>Pinch Points: Keep hands away from moving parts during operation.</p>
---	--

<p>⚠ WARNING</p>	
<ul style="list-style-type: none"> Support or secure pole that is being removed. An unsecured pole can fall. Use only 3/4" grade 100 alloy chains that have a minimum working load limit of 35,300 lb (16,012 kg). Other chains can break during operation. Do not change accessories, inspect, adjust, or clean piece of equipment when it is connected to a power source. Accidental startup can result in serious injury. <p>Failure to observe these warnings could result in severe injury or death.</p>	


	<p style="text-align: center;">⚠ WARNING</p> <p>Skin injection hazard: Oil under pressure easily punctures skin, causing serious injury, gangrene, or death. If you are injured by escaping oil, seek medical attention immediately.</p> <ul style="list-style-type: none"> Do not use hands to check for leaks. Depressurize the hydraulic system before servicing.
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	<p style="text-align: center;">⚠ WARNING</p> <p>Read and understand all of the instructions and safety information in this manual before operating or servicing this piece of equipment.</p> <p>Failure to observe this warning can result in severe injury or death.</p>
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	<p style="text-align: center;">⚠ WARNING</p> <p>Electric shock hazard: This piece of equipment is not insulated. Do not operate this equipment near energized lines.</p> <p>Failure to observe this warning can result in severe injury or death.</p>
---	--

	<p style="text-align: center;">⚠ WARNING</p> <p>Wear eye protection when operating or servicing this piece of equipment.</p> <p>Failure to wear eye protection can result in serious eye injury from flying debris or hydraulic oil.</p>
--	---


IMPORTANT SAFETY INFORMATION

	<p style="text-align: center;">⚠ WARNING</p> <p>Wear a hard hat when using this piece of equipment.</p> <p>Failure to observe this warning can result in severe injury or death.</p>
---	---

<p style="text-align: center;">⚠ WARNING</p> <p>Do not disconnect equipment, hoses, or fittings while the power source is running or if the hydraulic fluid is hot. Hot hydraulic fluid can cause serious burns.</p>

	<p style="text-align: center;">⚠ WARNING</p> <p>Wear foot protection when using this piece of equipment.</p> <p>Failure to observe this warning can result in serious injury.</p>
---	--

<p style="text-align: center;">⚠ CAUTION</p> <ul style="list-style-type: none"> • Inspect pole puller before use. Replace any worn, damaged, or missing parts. A damaged or improperly assembled piece of equipment can malfunction, injuring nearby personnel. • Inspect welds on all components. A cracked weld can fail, resulting in injury or property damage. • Inspect the hydraulic hoses and couplers every operating day. Repair or replace if leakage, cracking, wear, or damage is evident. Damaged hoses or couplers can fail, resulting in injury or property damage. • Use this piece of equipment for manufacturer's intended purpose only. Use other than that which is described in this manual can result in injury or property damage. • Make sure that all bystanders are clear of the work area when operating the piece of equipment. Nearby personnel can be injured by flying debris. <p>Failure to observe these precautions can result in injury.</p>
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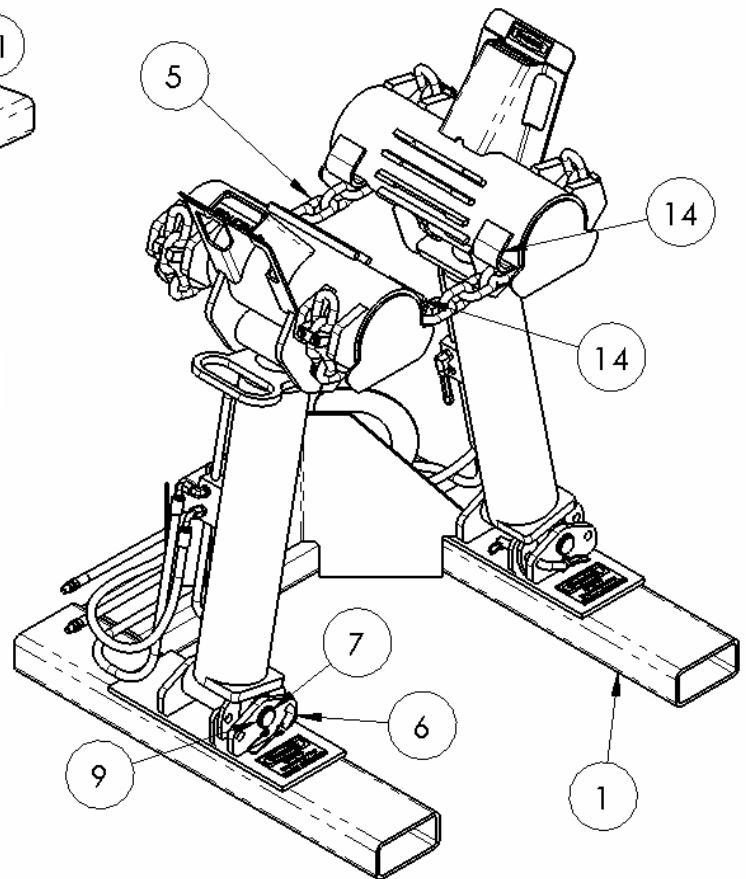
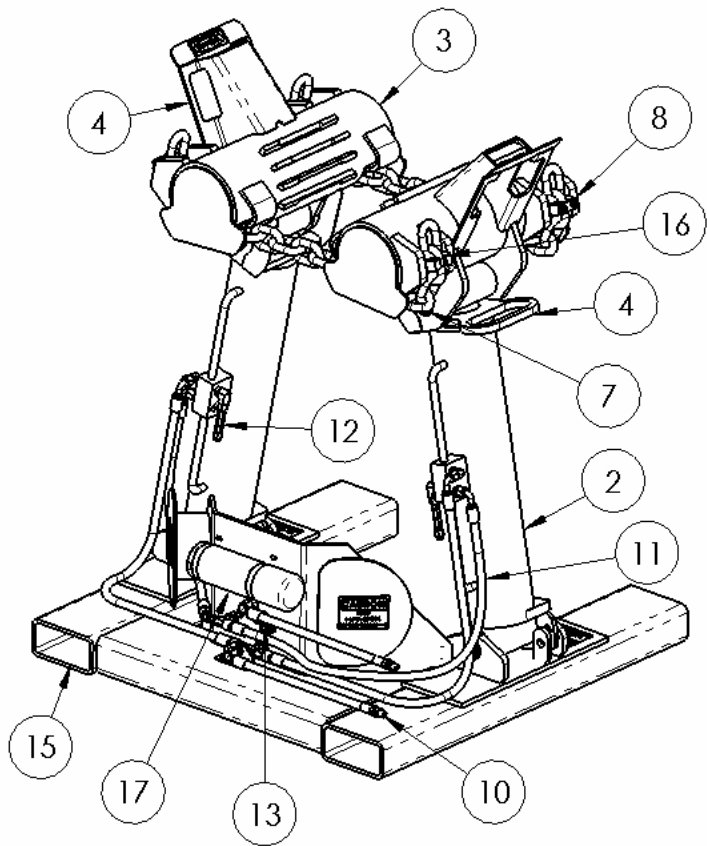
	<p style="text-align: center;">⚠ WARNING</p> <p>Piece of equipment and other components may be hot during and after operation. Allow to cool before handling, or handle with heat-resistant gloves.</p> <p>Failure to observe this warning can result in severe injury.</p>
---	--

<p style="text-align: center;">⚠ WARNING</p> <p>Do not exceed the following hydraulic power source maximums:</p> <ul style="list-style-type: none"> • Hydraulic flow: 15 gpm (57 l/min) • Pressure relief: 2,250 psi (155 bar) • Back pressure: 200 psi (14 bar) <p>Failure to observe this warning can result in severe injury or death.</p>

<p style="text-align: center;">IMPORTANT</p> <p>Procedure for connecting or disconnecting hydraulic hoses, fittings, or components:</p> <ol style="list-style-type: none"> 1. Move the flow lever on the hydraulic power source to the off position. 2. Stop the hydraulic power source. 3. Follow the sequence under "Hose Connections" to prevent pressure buildup. In case some pressure has built up, loosen hoses, fittings, or components slowly.

Note: Keep all decals clean and legible, and replace when necessary.

Identification



**POLE PULLER
Identification**

1. Frame
2. Cylinder
3. Head
4. Handle
5. Chain
6. Transport pin
7. Pivot pin
8. Chain retainer
9. Snap ring
10. Power source hose
11. Cylinder hose
12. Thermal relief valve
13. Counterbalance valve
14. Lifting point
15. Fork pocket
16. Chain ear
17. Manual holder

Specifications

Pole Puller

Type of Hydraulic System Open center or closed center

Hydraulic Ports..... 3/4-16 O-Ring

Lift Capacity 125,000 lb @ 2250 psi

Stroke..... 24" (61 cm)

Mass/Weight 1400 lb (635 kg)

Width..... 46" (116.8 cm)

Depth 46" (116.8 cm)

Height

 Retracted 58.75" (149.2 cm)

 Extended..... 82.75" (210.2 cm)

Chains

⚠ WARNING
<p>Use only 3/4" grade 100 alloy chains that have a minimum working load limit of 35,300 lb (16,012 kg). Other chains can break during operation.</p> <p>Failure to observe these warnings could result in severe injury or death.</p>

Alloy chains are furnished with the piece of equipment. Replacement chains are available from Diversified as repair parts. Any chain used with this piece of equipment must meet the following requirements:

Trade Size 3/4" (20 mm)

Grade..... 100

Minimum Working Load Limit 35,300 lb (16,012 kg)

Hydraulic Power Source

⚠ WARNING
<p>Do not exceed the following hydraulic power source maximums:</p> <ul style="list-style-type: none"> • Hydraulic flow: 15 gpm (57 l/min) • Pressure relief: 2,250 psi (155 bar) • Back pressure: 200 psi (14 bar) <p>Failure to observe this warning can result in severe injury or death.</p>

Type of Hydraulic System Open-center or closed-center

Flow

 Minimum 5 gpm (15 l/min)

 Maximum 15 gpm (57 l/min)

Operating Pressure

 Maximum 2,250 psi (155 bar)

Reservoir Capacity (minimum) 15 gal (37.9 l)

Filtration 10 micron (nominal)

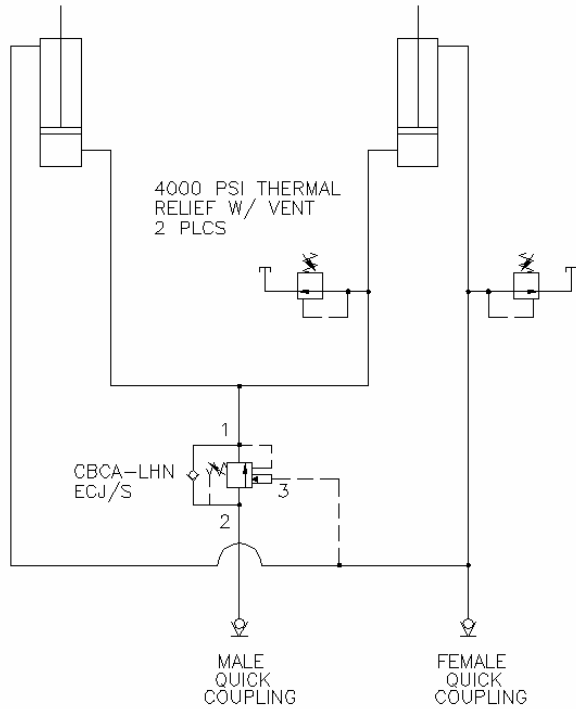
Pressure Relief Setting 2,250 psi (155 bar)

Back Pressure (maximum) 200 psi (13.8 bar)

Hydraulic Fluid Temp. (maximum) 140 °F (60 °C)

Specifications (cont'd)

Hydraulic Schematic



Recommended Hydraulic Fluids

Use any non-detergent, petroleum-based hydraulic fluid which meets the following specifications.

S.U.S. @

38 °C (100 °F) 140 to 225

99 °C (210 °F) 40 minimum

Flash Point 340 °F (171 °C) minimum

Pour Point -30 °F (-34 °C) minimum

Hoses and Fittings

Installation and Maintenance

Refer to SAE J1273 (Hose and Hose Assemblies).

Replacement

Refer to Parts Pages.

⚠ WARNING

Do not disconnect equipment, hoses, or fittings while the power source is running or if the hydraulic fluid is hot. Hot hydraulic fluid can cause serious burns.

Hose Connections

Control Valve

Refer to the Hydraulic Schematic under “Specifications.”

A three-position, four-way, directional control valve must be installed between the power source and the piece of equipment. Verify that valve type, flow, and pressure rating is compatible with power source specifications.

Connecting Hoses

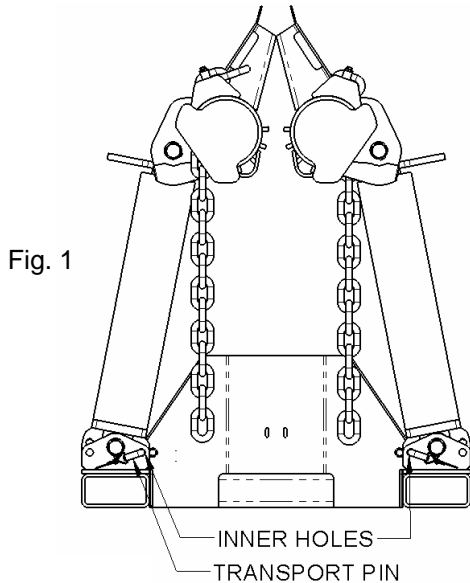
1. Move the flow lever on the hydraulic power source to the off position.
2. Stop the hydraulic power source.
3. Connect hose from top of manifold on pole puller to extend port on control valve.
4. Connect hose from bottom of manifold on pole puller to retract port on control valve.

Disconnecting Hoses

1. Move the flow lever on the hydraulic power source to the off position.
2. Stop the hydraulic power source.
3. Disconnect both hoses from the control valve.
4. Install dust caps over the ports to prevent contamination.

Transport

When transporting the pole puller, the cylinders should be secured using the transport pin and inner set of holes with the cylinders leaning toward each other. Properly secure the entire assembly to the transporting vehicle. See Fig. 1.



Operation

	<p>⚠ WARNING</p>
	<p>Pinch points: Keep hands away from moving parts during operation.</p>

<p>⚠ WARNING</p>
<p>Do not disconnect equipment, hoses, or fittings while the power source is running or if the hydraulic fluid is hot. Hot hydraulic fluid can cause serious burns.</p>

<p>⚠ WARNING</p>
<ul style="list-style-type: none"> • Support or secure pole that is being removed. An unsecured pole can fall. • Use only 3/4" alloy chains that have a minimum working load limit of 35,300 lb (16,012 kg). Other chains can break during operation. • Do not change accessories, inspect, adjust, or clean piece of equipment when it is connected to a power source. Accidental startup can result in serious injury. <p>Failure to observe these warnings could result in severe injury or death.</p>

Pre-Operation

Refer to the "Identification" section and the Hydraulic Schematic under "Specifications."

1. Stop the power source.
2. Connect hydraulic hoses from control valve to pole puller. Refer to "Hose Connections." Start power source.
3. It is recommended that power source be allowed to run (idle) for a few minutes to warm hydraulic reservoir fluid. Actuating piece of equipment intermittently will reduce the time required to warm fluid to an efficient operating temperature.
4. Cycle cylinders full stroke to remove any trapped air from piece of equipment and hoses. Stop power source. Check hydraulic fluid level in power source reservoir.

Operation

1. Pole must be secured using a suitable lifting device that can support the pole and safely lower it to the ground. The pole must be secured before pulling begins.
2. When leaning the cylinders or rotating the heads in either direction, only grab the handles on the cylinders and the heads. Avoid pinch points around the heads.

Operation (cont'd)

3. Before positioning the pole puller around a pole, pin the cylinders using the outer holes with the cylinders and the heads leaning away from each other. See Fig. 2. The pole puller should be placed around the pole in the most level position possible, utilizing an overhead lifting device or forks with adequate rated capacity. The pole should be centered between the heads. The heads should be parallel. If one of the heads needs to be rotated, it may be necessary to extend the cylinder slightly to relieve internal friction.

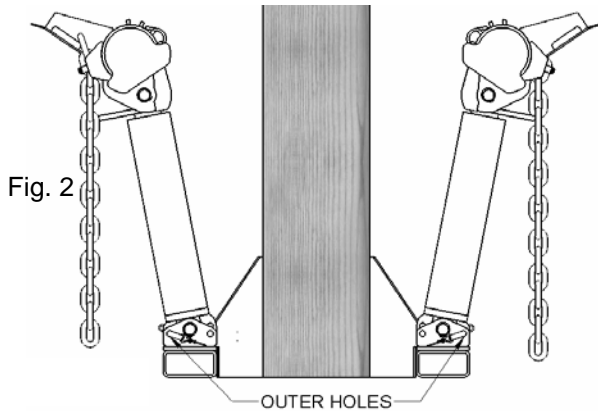


Fig. 2

4. Remove the transport pins. Keeping the heads rotated outward, lean the cylinders toward the pole. Depending on the size of the pole, the cylinders may stop before the heads touch the pole. If this happens, rotate the heads until they touch the pole. See Fig. 3. The cylinders should be leaned inward as far as possible.

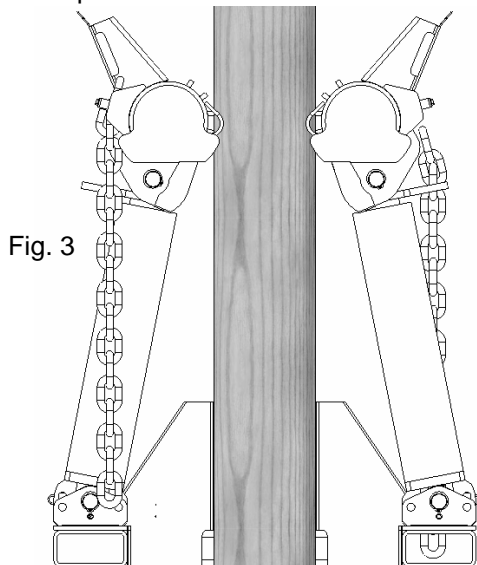


Fig. 3

5. Wrap each chain around the opposite head and hook it into the chain ear. Hook the chain as tightly as possible. The chain should not be twisted. Both chains should have equal amounts of slack. Wrap the free end of the chain over the head. The chain should not be between the teeth and pole. See Fig. 4.

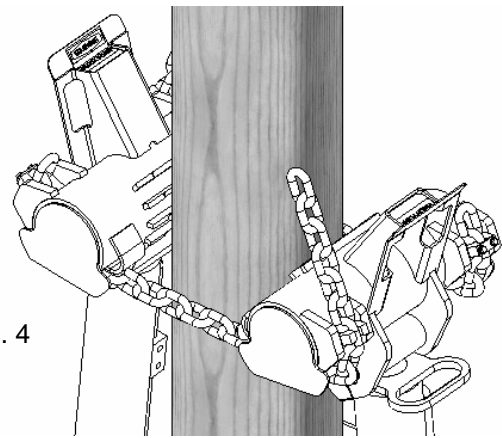
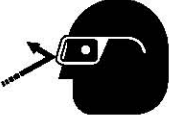


Fig. 4

6. Remove the remaining slack in the chains by rotating the heads slightly more. Hold the handle on the head and pull outward on the cylinder handle. Ideally, each head should be rotated at the same angle. This ensures that the teeth get a good initial bite. If one head is rotated toward the pole and the other is rotated away from the pole, the teeth may tend to slide up the pole.
7. Ensure that the pole is secured and that all personnel are a safe distance from the pole puller. Start power source. Extend the cylinders using the control valve. One or both of the heads will rotate toward the pole slightly as the chains tighten. Once the chains are tight, the pole will start lifting. The cylinders can pull the pole 24" with each stroke.
8. When both cylinders reach maximum stroke, ensure that the pole is secured by the lifting device and retract the puller cylinders close enough to loosen the chains. As the cylinders retract, the heads should disengage and rotate away from the pole automatically. If only one cylinder retracts, move the flow lever to the off position, stop power source and then grab the handles on the head of the cylinder that did not retract and rotate the head away from the pole manually. Do not operate the cylinders while personnel are rotating the heads. With both heads loose, retract the cylinders fully.
9. To pull the pole again, remove the chain slack as described in step 6 and repeat. If the pole is tapered significantly, it may be necessary to unhook the chains and adjust the length. When the pole is nearly out of the ground, ensure that the pole is secured by the lifting device and retract the cylinders as described in step 8. Stop power source. Unhook the chains and lean the cylinders outward. Pin the cylinders using the outer holes.

Maintenance

	<p>⚠ WARNING</p>
	<p>Wear eye protection when operating or servicing this piece of equipment.</p> <p>Failure to wear eye protection can result in serious eye injury from flying debris or hydraulic oil.</p>

<p>⚠ WARNING</p>
<p>Do not change accessories, inspect, adjust, or clean pole puller when it is connected to a power source. Accidental startup can result in serious injury.</p> <p>Failure to observe this warning can result in severe injury or death.</p>

<p>⚠ CAUTION</p>
<p>Inspect the hydraulic hoses and couplers every operating day. Repair or replace if leakage, cracking, wear, or damage is evident. Damaged hoses or couplers can fail, resulting in injury or property damage.</p>

Use this maintenance schedule to maximize the piece of equipment's service life.

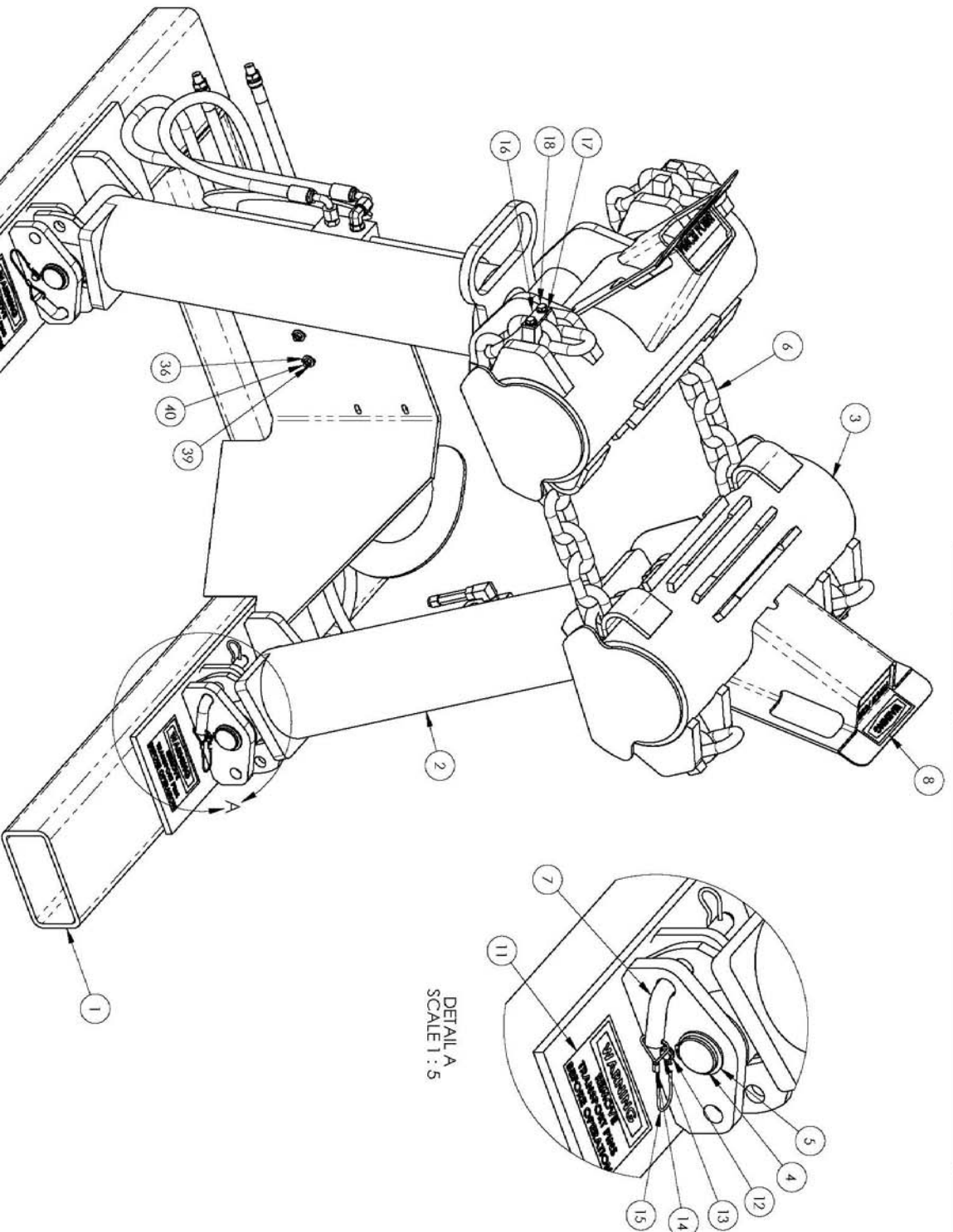
Notes: Keep all decals clean and legible, and replace when necessary.

When disposing of any components (hydraulic hoses, hydraulic fluid, worn parts, etc.), do so in accordance with federal, state, and local laws or ordinances.

Daily

1. Remove dirt and wood fragments from heads.
2. Inspect the puller for signs of leaks, cracks, wear, or damage. Repair or replace components if necessary.
3. Inspect the hydraulic hoses and fittings for signs of leaks, cracks, wear, or damage. Replace if necessary. Inspect welds on all components. A cracked weld can fail, resulting in injury or property damage.
4. Install dust caps over the hydraulic ports when the piece of equipment is disconnected.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
39		NUT, HEX, 5/16-18UNC	2
40		HHCS, 5/16-18UNC X 2 1/4	2
41	60741	PLUG, VENT, 1/4 MNPT	2
42	60749	HOLDER, MANUAL	1



DETAIL A
SCALE 1 : 5

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	61364	BASE W/DT	1
2	61354	CYLINDER, PULLER, POLE	1
3	61370	HEAD W/DEMENT	1
4	61365	PIN, CYL	1
5		SNAP RING, EXT, 1.75, HD	1
6	60742	CHAIN, .75 X 66 LONG GR 100	1
7	60732	PIN, BENT, 3/4" DIA X 4 1/2", L	1
8	60737	DECAL, PINCH POINT	1
9	60738	DECAL, READ INSTRUCTIONS	1
10	60731	DECAL, OPERATING PRESSURE	1
11	60730	DECAL, TRANSPORT PINS	1
12		PW, 1/4 SAE	1
13		HHCS 1/4-20UNC X 1/2" LG	1
14	60743	WIRE ROPE SLEEVE, 3/32, 2INC	1
15	60744	WIRE ROPE, 3/32, 8 1/2" OVER	1
16	61519	RETAINER, CHAIN	1
17		PW, 3/8 SAE	1
18		HHCS, 3/8-16 UNC X 3/4 LONN	1
19		ELBOW, 90°, -08 MORB X -08 F	1
20		ADAPTER, -08 MORB X -08 M/L	1
21	60740	VALVE, RELIEF, -04, 4000	1
22		ELBOW, 90°, -08 FORB X -08 M/L	1
23		ADAPTER, -08 MORB X -04 FO	1
24		ADAPTER, -04 MORB X 1/4 FNH	1
25	60736-02	HOSE ASSY, -08 X STRAIGHT, -	1
26	60736-01	HOSE ASSY, -08 X STRAIGHT, -	1
27	60745	MANIFOLD, COUNTERBALAN	1
28	60739	VALVE, CARTRIDGE, COUNT	1
29		TEE, BRANCH, -08 MJIC X -08	1
30		ELBOW, 45°, -08 MJIC X -08 F/L	1
31		PLUG, SOCKET, -08 MORB	1
32		TEE, RUN, -08 MJIC X -08 F/LIC	1
33		TEE, BULKHEAD BRANCH, -08	1
34		ADAPTER, -08 F/LIC X -06 MOR	1
35	60735	BULKHEAD	1
36		PW, 5/16 USS	1
37		HHCS, 5/16-18 UNC X 3/4	1
38		PW, 5/16 SAE	1

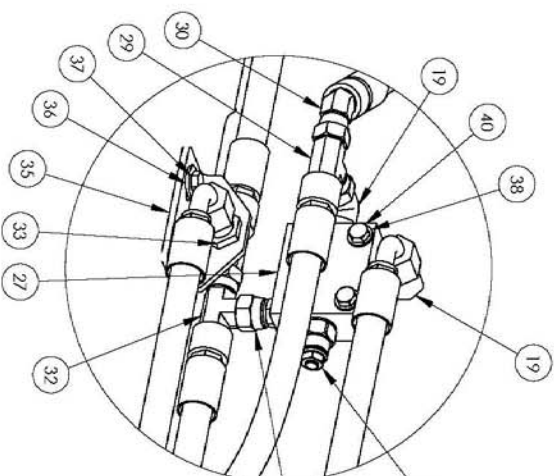
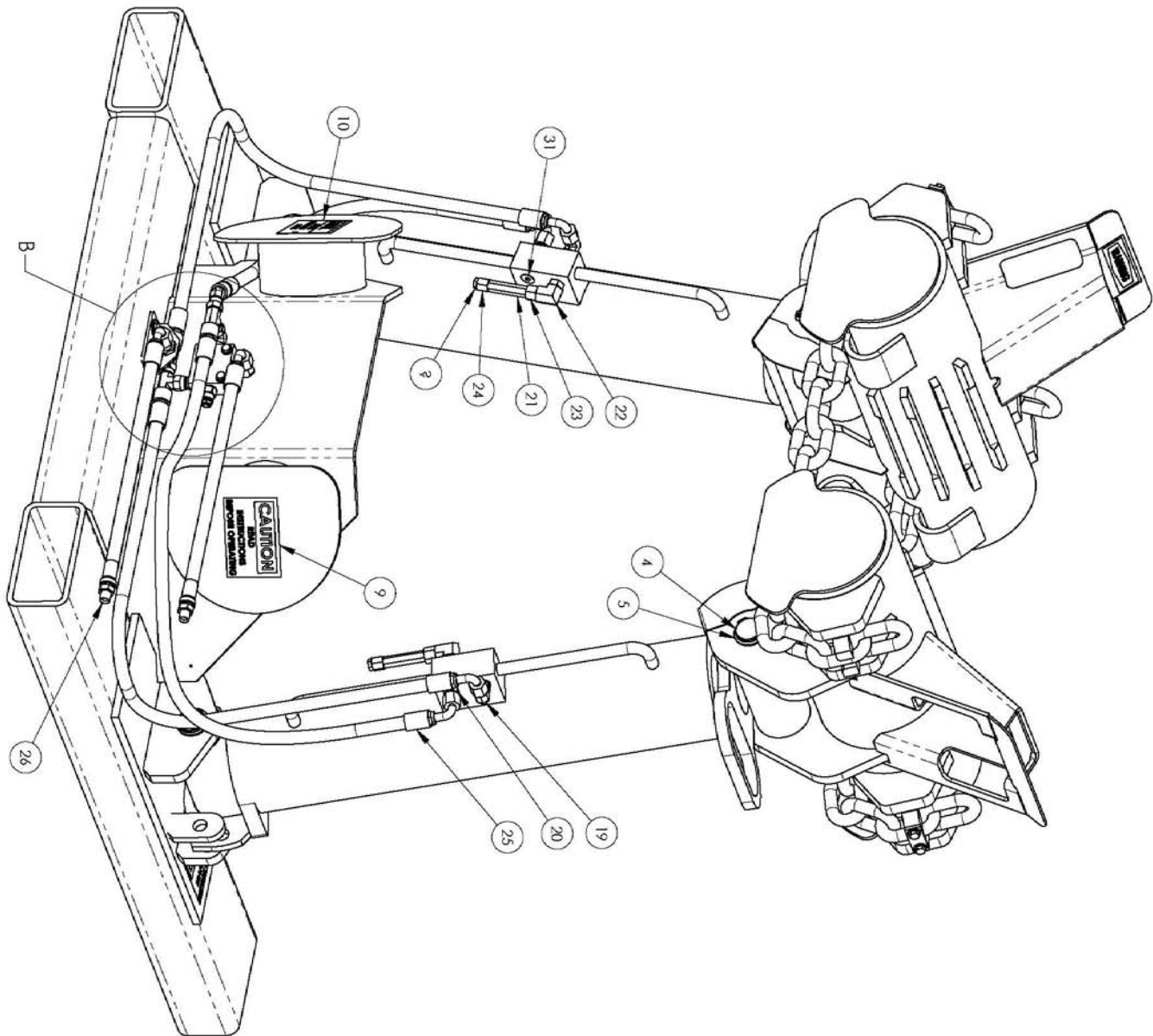
REV.	BY	DATE	REVISIONS
5	DW	05/21/08	ADD MANUAL HOLDER
4	DW	05/13/08	ADD HYDRAULIC FITTINGS
3	DW	05/05/08	ADD CHAIN, RETAINERS, LANYARDS & ASSOCIATED FASTENERS
2	DW	05/01/08	ADD DECALS
1	MB	3/26/2008	REDESIGNED

APPLICATION	WHERE USED
2 CYL POLE PULLER	

MATERIAL DESCRIPTION	
UNLESS OTHERWISE NOTED:	
TOLERANCES:	DECIMALS
FRACTIONS	X 1/16
ANGLES	3X ± .03
	20X ± .010
SURFACE FINISH	
PROJECTIONS OF VIEWS	
ALL DIMENSIONS ARE IN INCHES	
DRAWN	DW
CHECKED	-
APPROVED	-
DATE	8/15/07
SCALE	1:2.5

DIVER
PRODUC
PULLER

SEE DRAWING NO
613



DETAIL B
SCALE 1 : 4

MATERIAL DESCRIPTION

UNLESS OTHERWISE NOTED:

TOLERANCES: DECIMALS: X ± .1
FRACTIONS: 1/16" XX ± .03
ANGLES: ± 1° ANGLES: XXX ± .010

SURFACE FINISH: PROJECTION OR VIEWS: ALL DIMENSIONS ARE IN INCHES:

DRAWN: DW 8/15/07
CHECKED: -
APPROVED: -

**DIVER
PRODUCT**

PULLER,

SEE DRAWING NO. **B**
613
SCALE 1/8

2 CYL POLE PULLER

WHERE USED

APPROVED

DIVERSIFIED

• P R O D U C T •

DEVELOPMENT

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