ARROW®
MATERIAL HANDLING PRODUCTS

# TREE SHEARS
## OWNER'S MANUAL

## SCAN ME for contact information

The following manual should answer any questions you may have about our Tree Shears.
However, if you need additional information, please feel free to contact your local dealer.

800-821-7563 | arrowmhp.com | Sales@arrowmhp.com |

ARROW®
MATERIAL HANDLING PRODUCTS

# TREE SHEARS
## OWNER'S MANUAL

## TABLE OF CONTENTS



MODEL: _____

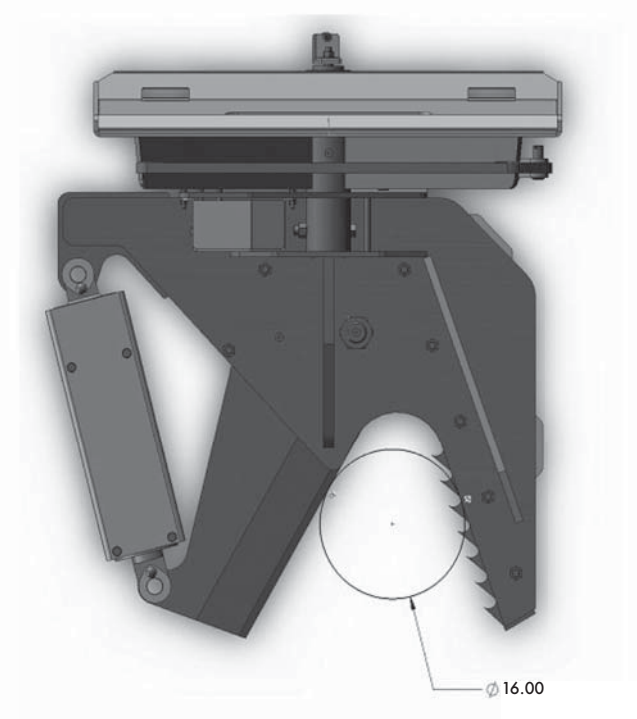
SERIAL NUMBER: _____
(Located on data plate attached to the unit frame)

DATE PURCHASED: _____

ARROW®
MATERIAL HANDLING PRODUCTS

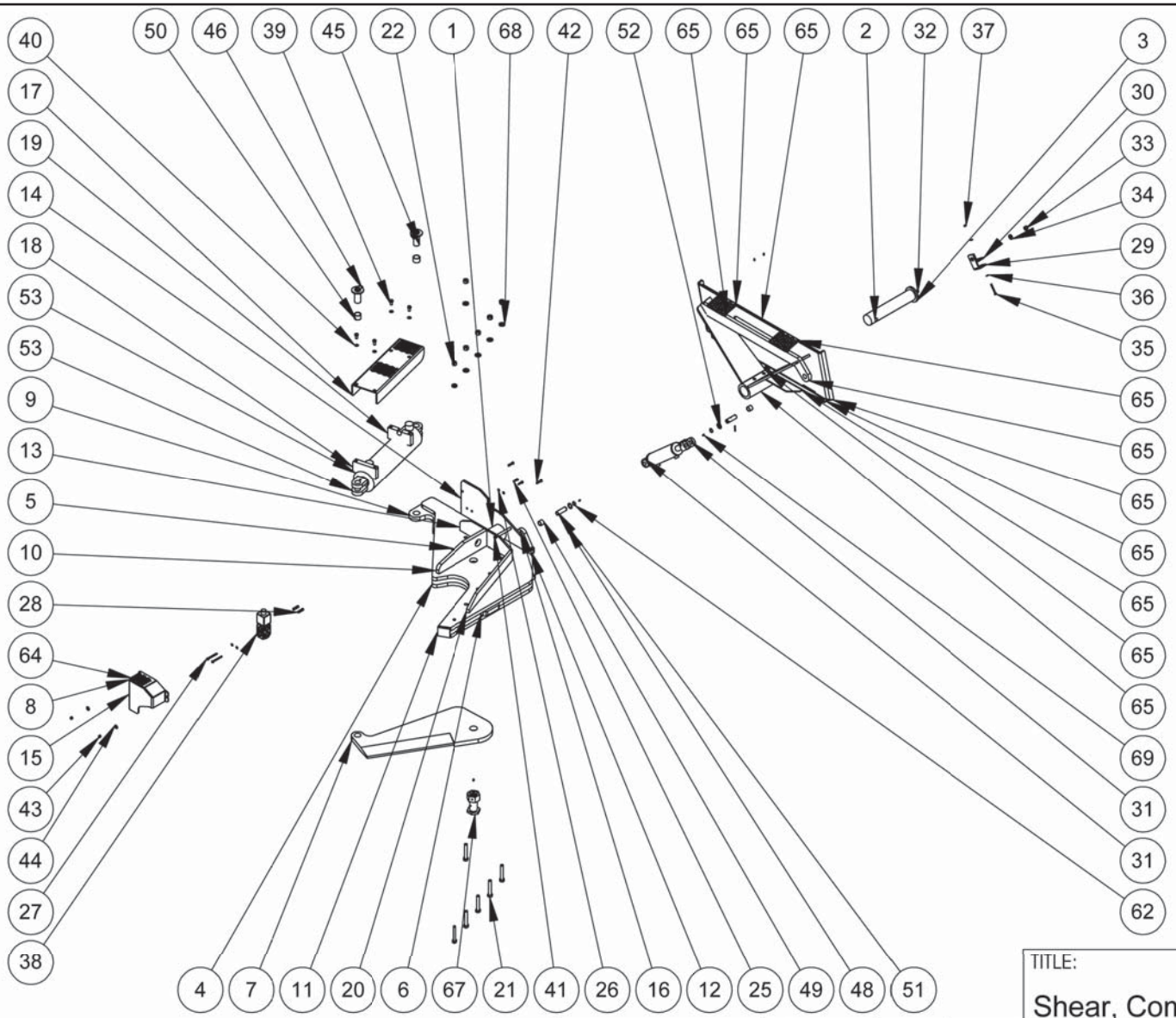
# HTC - 16”
## TREE SHEAR


# Technical Information on Commercial Shears




Specifications for commercial shear with universal coupler (p/n 230HTCUN-16).
For other models, please refer to the appropriate outline drawing.

| | |
|---|---|
| Rated capacity: | 16in (please refer to the “About Tree Shear Capacity Ratings Article”) |
| Weight: | 1300lb |
| Hitch: | SAE J2513 Universal skid steer coupler standard (other couplers available) |
| Blade cylinder: | 6” bore x 18” stroke. Rated for 3000psig operating pressure |
| Tilt cylinder: | 3” bore x 8” stroke. Rated for 3000psig operating pressure |
| Effective blade force: | Please refer the blade force graph in this section of the catalog |
| Blade transit time: | Please refer to the blade transit time graph in this section of the catalog |
| Plumbing: | 4000psig hoses with durable wrap are provided with the unit |
| Wiring: | Wiring is provided with the unit. |
| Solenoid valve: | 12VDC |
| Activation current draw: | 4.5A |
| Hold open current draw: | l .OA (holds valve in “tilt” position) |
| Idle current draw: | OA (holds valve in “blade” position) |
| Blade material: | ASTM A514-Gr B (“TI” steel) |






Notes:
1. Refer to plumbing diagram for hydraulics details

| Rev | By | Date | Description |
|---|---|---|---|
| 2 | RTG | 23 Apr 14 | Updated exploded view and part list |
| Rev | By | Date | Description |
| 1 | RTG | 31 Jul 09 | Updated fasteners. Updated drawing format |

| UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES<br>TOLERANCES:<br>FRACTIONAL± 1/16<br>ANGULAR: MACH±1° BEND ±2°<br>ONE PLACE DECIMAL ±.060<br>TWO PLACE DECIMAL ±.030<br>THREE PLACE DECIMAL ±.010 | DRAWN | RTG | 4 Nov 08 |
| | CHECKED | | |
| | ENG APPR. | | |
| | MFG APPR. | | |
| DO NOT SCALE DRAWING | Q.A. | | |

TITLE:
Shear, Commercial

| SIZE | DWG. NO. | REV |
|---|---|---|
| A | 230HTCUN Exp | 2 |
| SCALE: 1:40 | WEIGHT: 1285.02 | SHEET 1 OF 2 |

| ITEM NO. | Description | Weight | Default/QTY. | UOM |
|---|---|---|---|---|
| 1 | Tube, Frame | 10.88 | 1 | ea |
| 2 | Shaft | 34.13 | 1 | ea |
| 3 | Retainer, Shaft | 1.01 | 1 | ea |
| 4 | Frame, Bottom | 233.82 | 1 | ea |
| 5 | Frame, Top | 227.19 | 1 | ea |
| 6 | Spacer, Frame | 5.96 | 2 | ea |
| 7 | Blade, Shear | 133.95 | 1 | ea |
| 8 | Cap | 2.89 | 1 | ea |
| 9 | Mount, Cylinder | 29.27 | 1 | ea |
| 10 | Stiffener, Frame | 20.16 | 1 | ea |
| 11 | Cap, Nose | 0.95 | 1 | ea |
| 12 | Perch, Lug | 27.76 | 1 | ea |
| 13 | Cap, Shaft Tube | 12.12 | 1 | ea |
| 14 | Bracket, Solenoid | 25.91 | 1 | ea |
| 15 | Guard, Solenoid | 7.69 | 1 | ea |
| 16 | Lug, Tilt Cyl | 5.60 | 1 | ea |
| 17 | Guard, Cylinder | 24.42 | 1 | ea |
| 18 | Mount, Cylinder Guard | 6.86 | 1 | ea |
| 19 | Mount, Cyl Guard Rear | 6.37 | 1 | ea |
| 20 | Stiffener, Diagonal | 15.75 | 1 | ea |
| 21 | Bolt, Hex Head | 0.7297 | 6 | ea |
| 22 | Nut, Hex | 0.160 | 6 | ea |
| 23 | Bolt, Hex Head | 1.1443 | 1 | ea |
| 24 | Nut, Hex | 0.184 | 1 | ea |
| 25 | Bolt, Hex Head | 0.0417 | 2 | ea |
| 26 | Washer, Lock | 0.00171 | 4 | ea |
| 27 | Bolt, Hex Head | 0.0855 | 2 | ea |
| 28 | Nut, Hex Coupling | 0.082 | 2 | ea |
| 29 | Bracket, Hose Large | 0.98 | 1 | ea |
| 30 | Bracket, Hose Small | 0.64 | 1 | ea |
| 31 | Cylinder, Hydraulic | 31.24 | 1 | ea |
| 32 | Bolt, Hex | 0.15 | 1 | ea |
| 33 | Nut, Hex | 0.085 | 1 | ea |
| 34 | Washer, Flat | 0.028 | 1 | ea |
| 35 | Bolt, Hex Head | 0.07 | 1 | ea |
| 36 | Washer, Flat | 0.005 | 2 | ea |
| 37 | Nut, Hex | 0.013 | 1 | ea |
| 38 | Assy, Solenoid Valve | 13.04 | 1 | ea |
| 39 | Bolt, Hex Head | 0.1061 | 4 | ea |
| 40 | Washer, Lock | 0.00438 | 4 | ea |
| 41 | Rod, Hose Loop | 0.55 | 1 | ea |
| 42 | Bolt, Hex Head | 0.07 | 2 | ea |
| 43 | Nut, Hex | 0.019 | 2 | ea |
| 44 | Washer, Flat | 0.00745 | 2 | ea |
| 45 | Retainer, Pin | 2.53 | 2 | ea |
| 46 | Bolt, Button Head | 0.09 | 2 | ea |
| 47 | Tie, Cable | .001 | 14 | ea |
| 48 | Pin, Spiral | 0.01 | 2 | ea |
| 49 | Bushing | 0.13 | 2 | ea |
| 50 | Bushing | 0.23 | 2 | ea |
| 51 | Pin, Cylinder | 0.64 | 2 | ea |
| 52 | Washer, Cyl Pin | 0.02 | 2 | ea |
| 53 | Cylinder, Hydraulic | 142.40 | 1 | ea |
| 54 | Adapter | .1 | 4 | ea |
| 55 | Adapter | .1 | 1 | ea |
| 56 | Adapter | .1 | 1 | ea |
| 57 | Assy, Supply Hose | 6.77 | 1 | ea |
| 58 | Assy, Tilt Hose | 2.28 | 1 | ea |
| 59 | Assy, Long Blade Hose | 1.47 | 1 | ea |
| 60 | Assy, Short Blade Hose | 1.11 | 1 | ea |
| 61 | Kit, HTC Decal | 0 | 1 | ea |
| 62 | Ring, Snap | 0.00 | 2 | ea |
| 63 | Plate, Tread | 0.18 | 2 | ea |
| 64 | Plate, Tread | 0.11 | 1 | ea |
| 65 | Hitch, HTC | 216.80 | 1 | ea |
| 66 | Doubler, Bottom | 16.29 | 1 | ea |
| 67 | Bolt, Pivot | 8.21 | 1 | ea |
| 68 | Washer, Plain | 0.052 | 6 | ea |
| 69 | Zerk, Grease | 0.01 | 8 | ea |

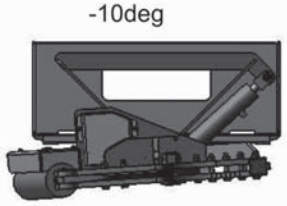
TITLE:

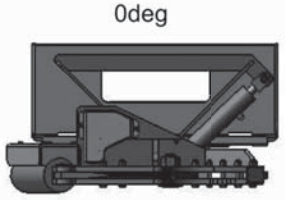
| | NAME | DATE |
|---|---|---|
| DRAWN | RTG | 4 Nov 08 |
| CHECKED | | |
| ENG APPR. | | |
| MFG APPR. | | |
| Q.A. | | |

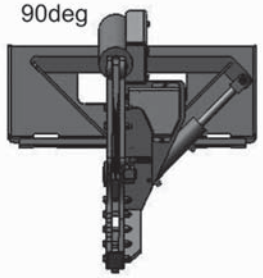
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/16
ANGULAR: MACH ± 1° BEND ±2°
ONE PLACE DECIMAL ±.060
TWO PLACE DECIMAL ±.030
THREE PLACE DECIMAL ±.010
DO NOT SCALE DRAWING

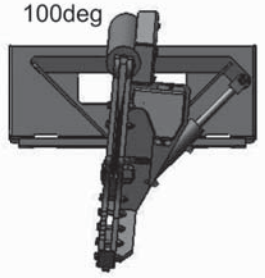
SIZE A | DWG. NO. 230HTCUN Exp | REV 2
SCALE: 1:50 | WEIGHT: | SHEET 2 OF 2

| Rev | By | Date | Description |
|---|---|---|---|

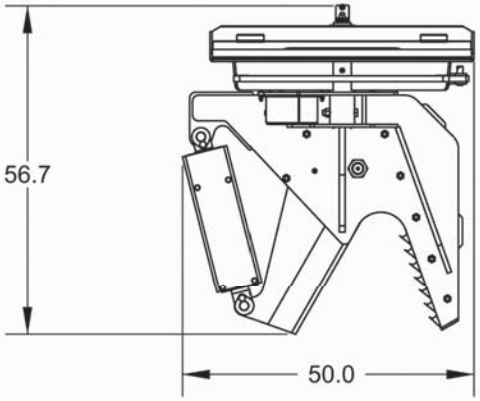


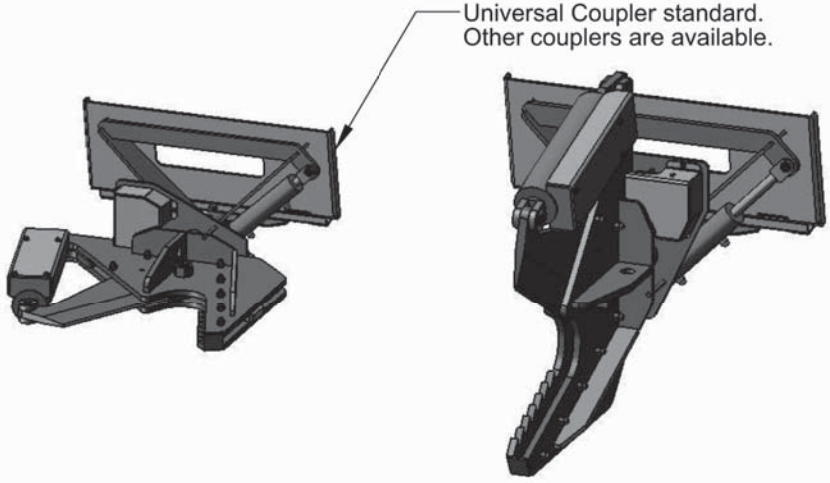



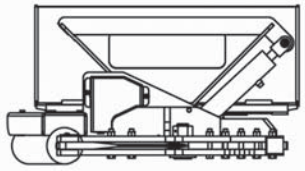



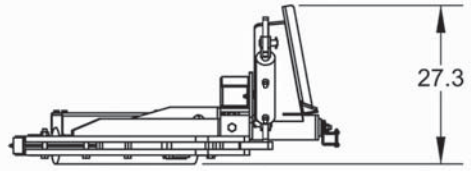








Notes:
1. Ask your salesperson for information about the high-flow hydraulic couplers for this unit.
2. All hinge points are greaseable.
3. Hoses are included. Not shown on this print for clarity.

| Rev | By | Date | Description |
|---|---|---|---|
| | | | |

| UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES<br>TOLERANCES:<br>FRACTIONAL± 1/16<br>ANGULAR: MACH±1° BEND ±2°<br>ONE PLACE DECIMAL ±.060<br>TWO PLACE DECIMAL ±.030<br>THREE PLACE DECIMAL ±.010 | DRAWN | RTG | 10 May 07 |
| | CHECKED | | |
| | ENG APPR. | | |
| | MFG APPR. | | |
| DO NOT SCALE DRAWING | Q.A. | | |

TITLE:
Shear, Commercial

| SIZE | DWG. NO. | REV |
|---|---|---|
| A | 1000480 Outline | |

| SCALE: 1:30 | WEIGHT: 1279.70 | SHEET 1 OF 1 |
|---|---|---|

# Operating Instructions

**Capacity: 16” diameter**

Do not use as a stump puller

Do not use as a Bulldozer

Do not use the machine’s tilt or lift function during the cutting cycle

Never operate when people are within the felling area

Never operate with people near the blade

Machine should be off when performing any maintenance or lubrication on shear

Do not operate with stumps, limbs, rocks, or other obstacles between frame and shear cylinder! Doing so will bend cylinder rod and void warranty.

Do not operate with shear in an elevated position, on dangerous slopes, or where machine is on unstable terrain

Arrow Tree Shear is manufactured to cut trees and wood only

Hoses and fittings should be inspected regularly for damage and wear, and should be replaced as needed.

Occasional cleaning of dirt and chips from between frames is recommended

Spraying with slip plate (dry graphite) will aid operation of shear. Spraying blade will also be beneficial.

## MISUSE WILL VOID WARRANTY

*Always follow the machine’s safety procedures recommended by the manufacturer.*

The Arrow Tree Shear is capable of felling a larger tree than can be safely carried and may require additional cutting by rotating shear to the vertical position. Always be aware of the stability of the machine and its safe load handling limits and capabilities.

NOTE: On the MT (Manual Tilt unit) make sure the blade is in the completely closed position, engine is shut down, and hydraulics and drive system is locked in safe mode before rotating.

## Before Using

Cycle blade cylinder and tilt cylinder completely 3-4 times to fill the shear's hydraulic system with oil. Next, pump grease liberally in the center pivot pin grease point and the grease point on the right hand side of the shear's frame. (Note: "Right" as viewed from the operator's seat). Repeat this procedure 3 times with blade completely closed and completely open for initial start-up on new machine. Regrease cylinder pins and grease points on rotating collar. Check hydraulic oil level of machine. You will need to add approximately 2 1/2 gallons.

## Break In

After 8-10 hours of operation, frame bolts may experience an initial stretch. Check for any gap between the blade and upper and lower frames. If there is a gap, tighten the 3/4" bolts and pivot pin bolt.

## Tilt Adjustment

If more tilt is needed in the horizontal position, the rod clevis may be turned inward (or further onto the tilt cylinder rod) up to 2 complete threads. This will allow more travel in the horizontal, or felling position. By turning the rod clevis the opposite direction, more travel in the vertical cutting position is accomplished.

## IMPORTANT

Care should be taken to maintain clearance between tilt cylinder barrel and pivot shaft tube.

## Hoses

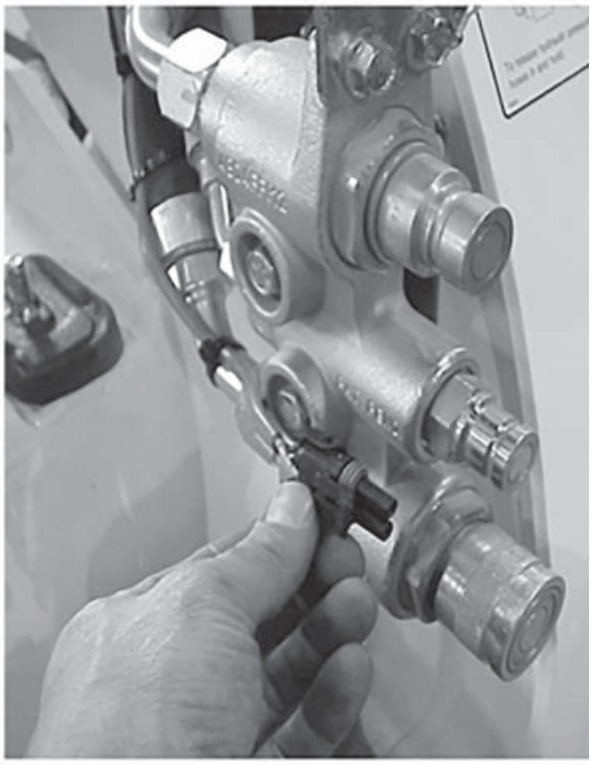
Inadequate lubrication on all grease points will dramatically decrease the shear's life and performance. The hoses supplied with the HTC shear have a #12 M SAE fitting (#12 male ORB).
Adapters and couplings are available from the factory. Any damaged hoses or fittings should be replaced by a qualified technician.


## Hose Routing

The factory recommended hose routing brings the hoses through the center of the machine and loops over to the hydraulic fi ttings as shown. This has proven to be the best routing to prevent snags and other hose issues. Other hose routings may result in damage and void warranty.

# Wiring Instructions for the Tree Shears

Begin with the 22 ft harness that has the plug mating with the wire plug that comes from the shear. Start at the couplings and follow the hydraulic lines into the engine compartment, to an area close to the source of power (battery). You might have more wire than you need, so coil up extra and tie out of the way. Tie switch to lever and feed the 12 ft harness into engine compartment connecting to a 12-volt power source (Red Positive + Black Negative -). If you feed wire through rubber grommets around control levers make sure wire is not pinched when using your levers. Plug switch harness into harness that was left near your power source. Test tilt action. If you have any problems check all connections.




The most common problem is a bad ground. It is recommended that both leads on the switch harness are connected directly to the battery terminals.

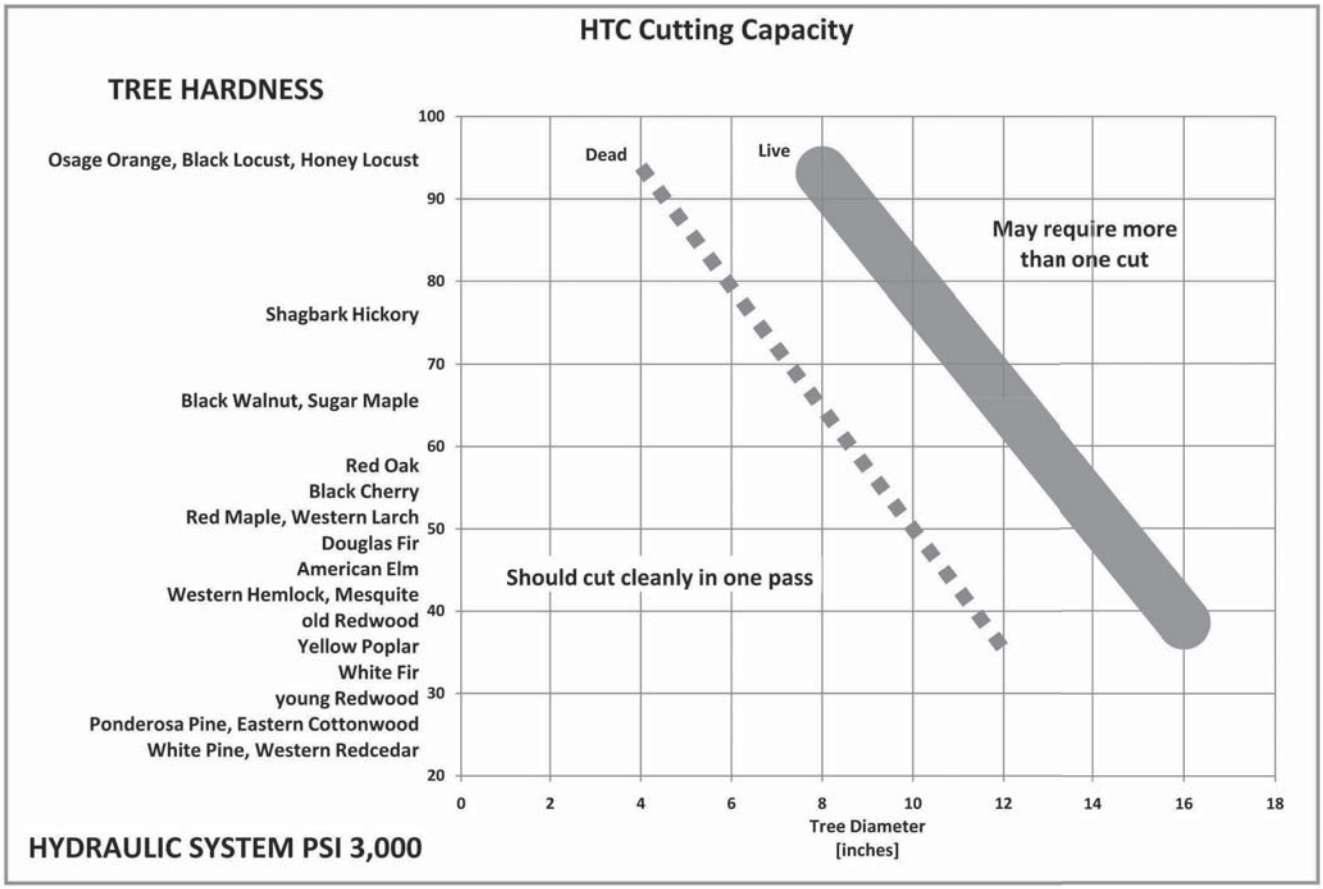
# Cutting Recommendations

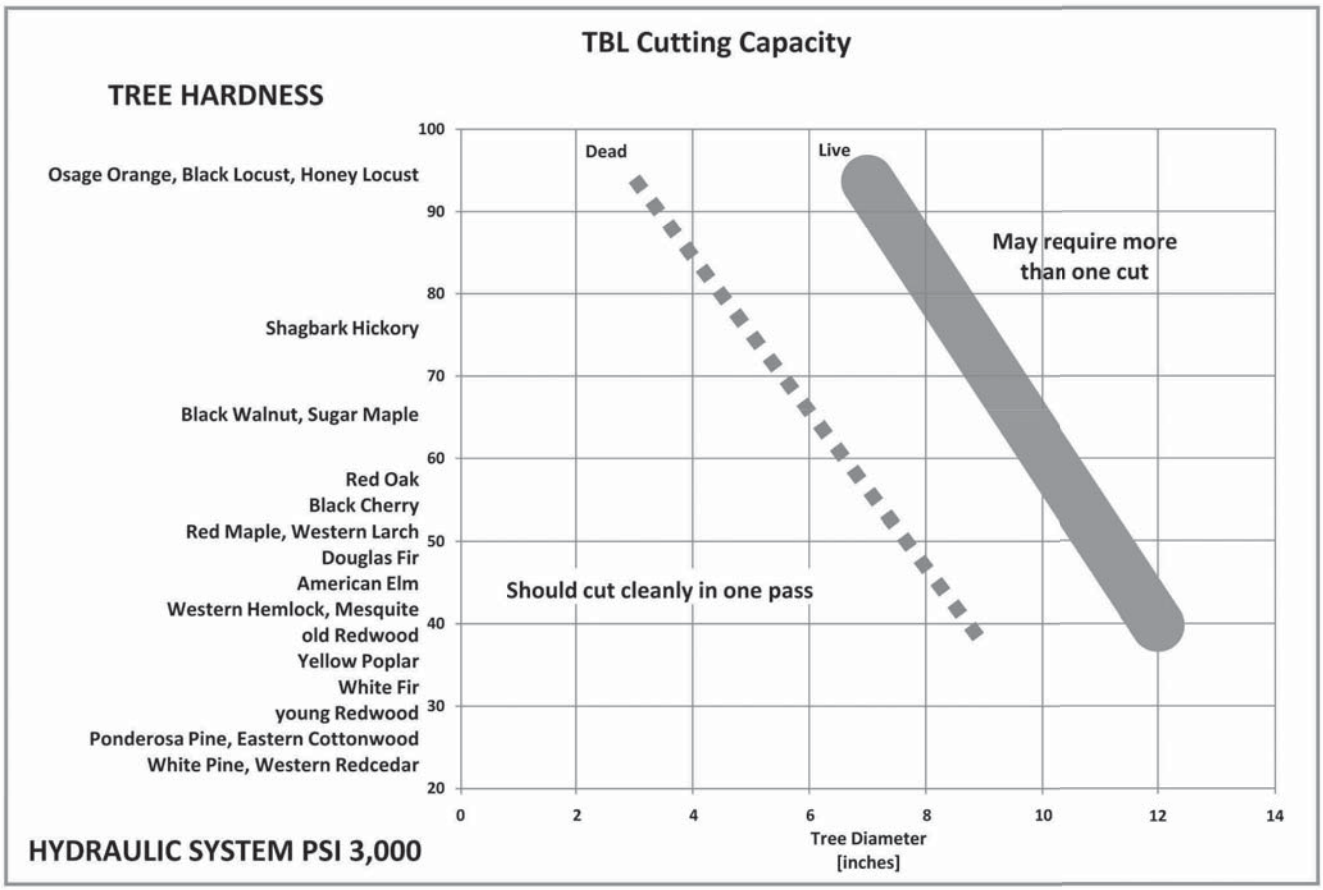
- Tree should be sheared as perpendicular to the grain as possible . Cutting on an angle to the grain could cause undo strain in cylinder pins, cylinder, frame bolts, and blade and may void warranty.
- When cutting small trees (3-5”diameter) the blade can be opened just enough to cut the tree in the front portion of the frame to blade opening, reducing cycle time.
- When cutting larger sections at or close to the machines rated capacity, open blade completely. Position the tree trunk as far to the rear of the frame to blade V opening as possible for most power.
- When attempting to get to base of trees with bushy lower branches, tilt tip of blade upward or downward and cut your way in.
- When cutting overhanging branches, rotate blade vertically and cut from the side.
- Because of its design, trees sheared with the timberline almost always fall to the left, in the direction of blade travel. Plan your job accordingly.

To cut at ground level, lower shear to the ground 1-2 feet away from tree. While moving forward towards the tree, use a slight downward pressure to dig or plow into the ground as tree is contacted. This method will yield a cut at slightly below ground level, considering the trunk fl are of the tree is not too large.

**Cutting capacity will vary according to hydraulic pressure, cutting conditions, and species of tree.**

Note: Seasoned wood cuts much harder than live, green wood. Therefore, cutting capacity and performance will vary accordingly.

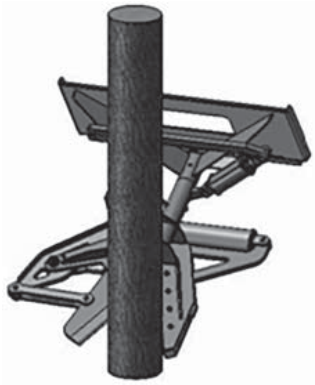

HTC Cutting Capacity
TREE HARDNESS
Osage Orange, Black Locust, Honey Locust
Shagbark Hickory
Black Walnut, Sugar Maple
Red Oak
Black Cherry
Red Maple, Western Larch
Douglas Fir
American Elm
Western Hemlock, Mesquite
old Redwood
Yellow Poplar
White Fir
young Redwood
Ponderosa Pine, Eastern Cottonwood
White Pine, Western Redcedar
100
90
80
70
60
50
40
30
20
Dead
Live
May require more than one cut
Should cut cleanly in one pass
0
2
4
6
8
10
12
14
16
18
Tree Diameter [inches]
HYDRAULIC SYSTEM PSI 3,000


TBL Cutting Capacity
TREE HARDNESS
Osage Orange, Black Locust, Honey Locust
Shagbark Hickory
Black Walnut, Sugar Maple
Red Oak
Black Cherry
Red Maple, Western Larch
Douglas Fir
American Elm
Western Hemlock, Mesquite
old Redwood
Yellow Poplar
White Fir
young Redwood
Ponderosa Pine, Eastern Cottonwood
White Pine, Western Redcedar
100
90
80
70
60
50
40
30
20
Dead
Live
May require more than one cut
Should cut cleanly in one pass
0
2
4
6
8
10
12
14
Tree Diameter [inches]
HYDRAULIC SYSTEM PSI 3,000

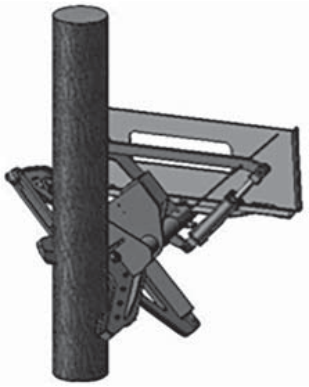
# Recommended Cutting Technique

**IDEAL CUT:** Shear frame and blade are squared to the axis of the tree. Wood grain is cut cleanly .

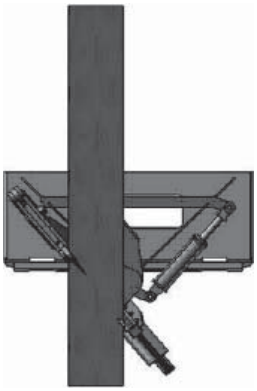
**OK CUT:** Blade cuts perpendicular to wood grain, but frame is not squared to the axis of the tree.



**AVOID THIS CUT:** Frame and blade are skewed to the axis of the tree. Blade damage will occur.



**AVOID THIS CUT:** (*Closeup view)* Notice that the wood grain will catch the blade and pull it out of plane. As this happens the frame will rotate and the blade will not pocket correctly. Blade damage and an incomplete cut will result

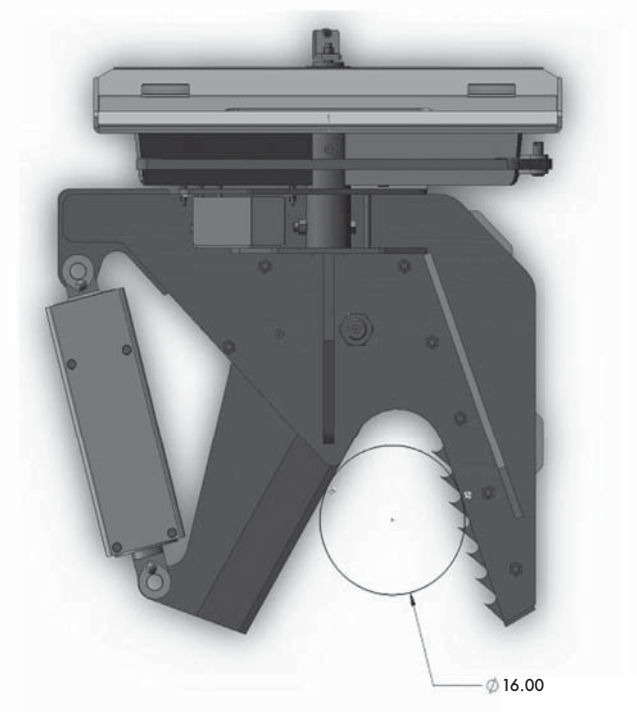


# Typical Blade Damage from Improper Cuts

Below are two pictures of typical blade damage resulting from skewed cuts (see previous page). The notches are caused by the blade deflecting downward into the teeth, and the linear burrs are caused by the blade deflecting upward into the top frame. BLADE DAMAGE IS NOT A SIGNIFICANT ISSUE. One of the unique features of the Arrow single blade shear is that it will continue to cut effectively even with the blade marred as shown below. At the end of your day, or as convenient, use a grinder to dress the burrs from the blade edge and then continue to use the shear. Two-bladed shears are not nearly as tolerant.

# About Tree Shear Capacity Ratings

There are some technicalities to keep in mind when comparing tree shears on rated capacity alone, particularly when comparing single-bladed shears to two-bladed shears.



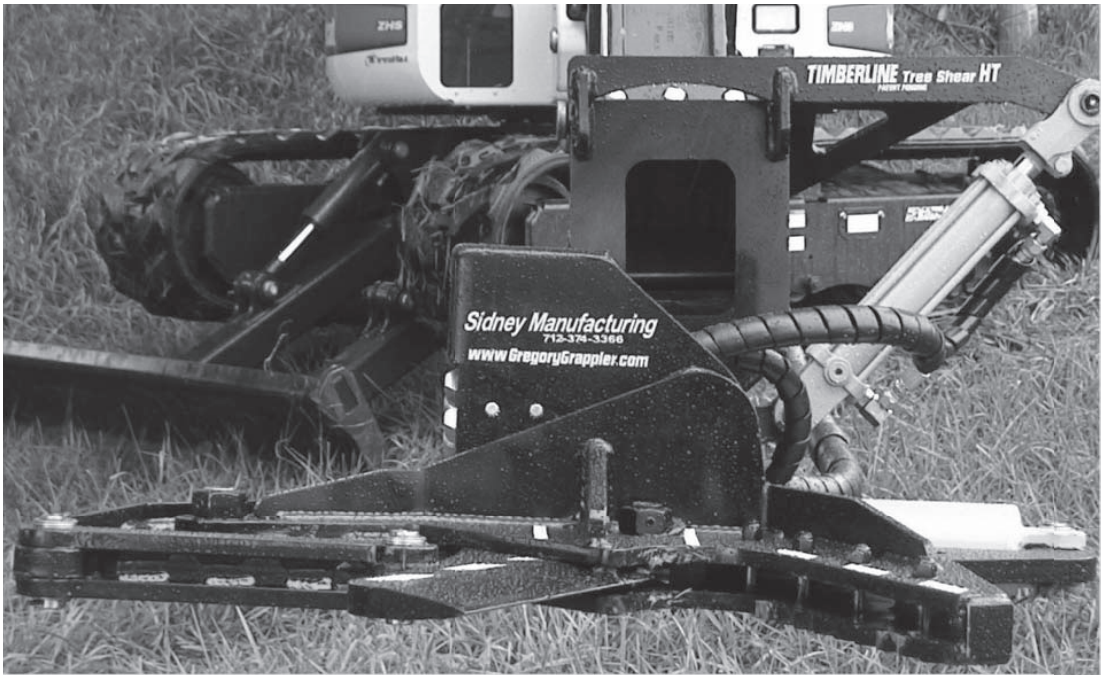

Arrow tree shears are rated using the following assumptions:

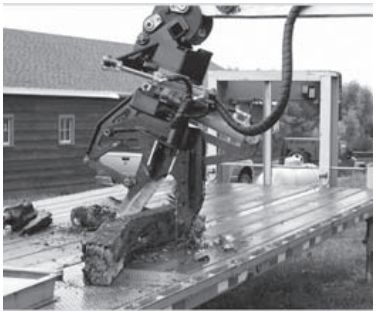
- The tree has a circular cross section (as shown above)
- The tree is pushed as far back into the mouth of the shear as possible
- The tree is standing and is alive
- The cut is square with respect to the grain of the wood

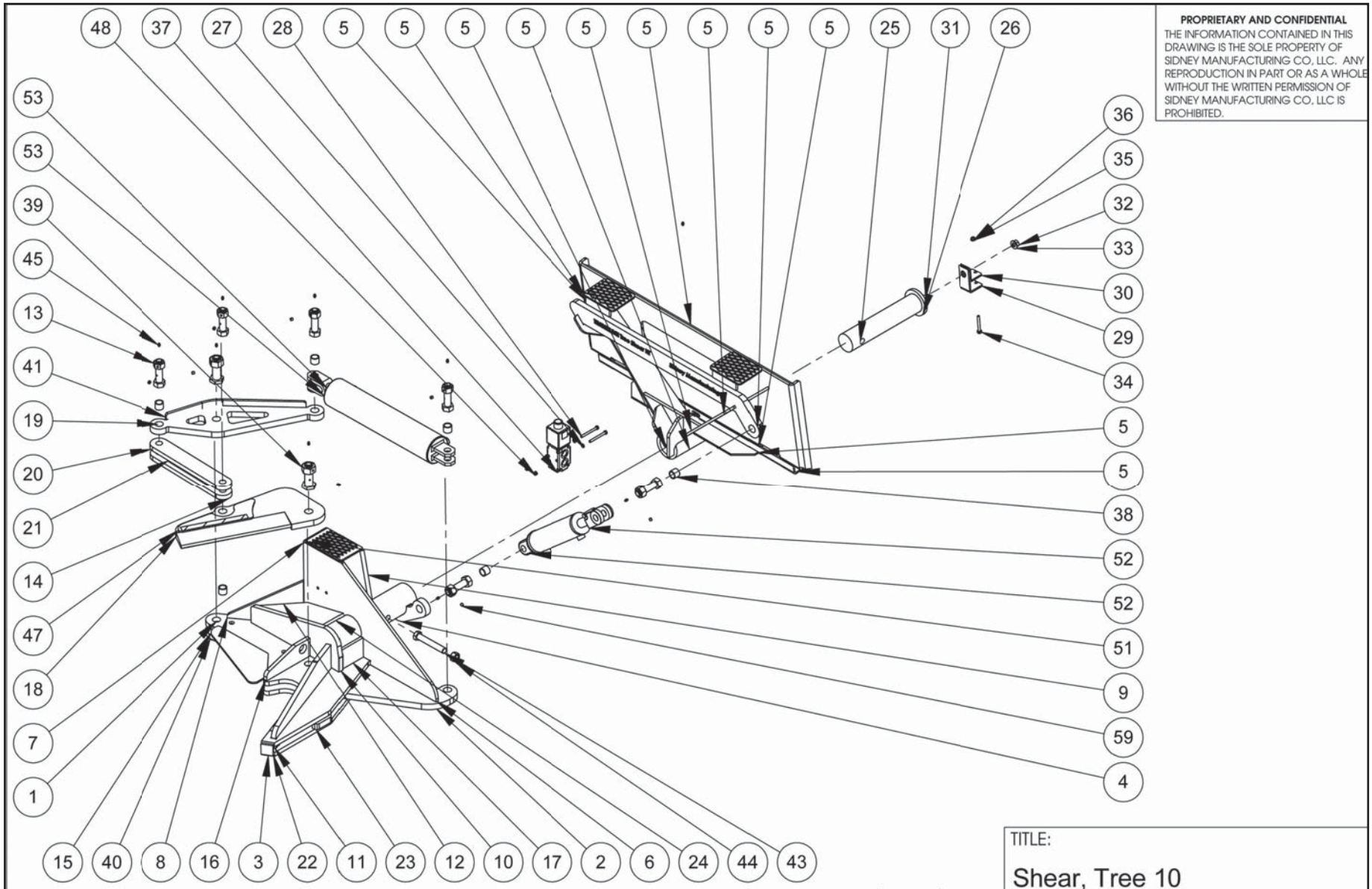
Many conditions that you will see in the field may alter your perception of the capacity of the shear. For example, a tree with a gnarled cross section or one that is standing but has been dead for some time will affect your ability to make a clean, single-pass, cut. This is true for all tree shears regardless of the number of blades. The advantage of a single blade shear is that the tree does not have to fit nicely into the circle created by the blade reinforcement on a two-bladed shear. Trees of many different shapes are easily accommodated by the single-blade Arrow design.

ARROW®
MATERIAL HANDLING PRODUCTS

# TBL1010 - 10”
# TREE SHEAR








| Rev | By | Date | Description |
|---|---|---|---|
| 1 | RTG | 28 Apr 14 | Revised labeling system. Added page 2 BOM. |

| UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES<br>TOLERANCES:<br>FRACTIONAL± 1/16<br>ANGULAR: MACH±1° BEND ±2°<br>ONE PLACE DECIMAL ±.060<br>TWO PLACE DECIMAL ±.030<br>THREE PLACE DECIMAL ±.010 | DRAWN | RTG | 3 Aug 10 |
| | CHECKED | | |
| | ENG APPR. | | |
| | MFG APPR. | | |
| DO NOT SCALE DRAWING | Q.A. | | |

TITLE:

# Shear, Tree 10 Exploded View

| SIZE | DWG. NO. | REV |
|---|---|---|
| A | TBL1010UN Exp | 1 |

| SCALE: 1:20 | WEIGHT: 751.90 | SHEET 1 OF 2 |
|---|---|---|

| ITEM NO. | Description | Weight | UN Open/QTY. | UOM |
|---|---|---|---|---|
| 1 | Frame, Top | 67.67 | 1 | ea |
| 2 | Mount, Cylinder | 27.65 | 1 | ea |
| 3 | Frame, Bottom | 70.11 | 1 | ea |
| 4 | Lug, Tube | 4.14 | 1 | ea |
| 5 | Hitch, UN new TBL | 195.26 | 1 | ea |
| 6 | Bracket, Solenoid | 39.13 | 1 | ea |
| 7 | Cap | 4.53 | 1 | ea |
| 8 | Gusset, Frame Arm | 7.03 | 1 | ea |
| 9 | Rod, Hose Loop | 0.86 | 1 | ea |
| 10 | Cap, Tube | 19.63 | 1 | ea |
| 11 | Stiffener, Diagonal | 22.33 | 1 | ea |
| 12 | Gusset, Tube | 7.22 | 1 | ea |
| 13 | Bolt, Hinge Long | 1.45 | 6 | ea |
| 14 | Washer, Lock | 0.13 | 6 | ea |
| 15 | Cover | 4.37 | 1 | ea |
| 16 | Stiffener, Frame | 3.83 | 1 | ea |
| 17 | Gusset, Tube | 2.28 | 1 | ea |
| 18 | Blade, Shear | 41.70 | 1 | ea |
| 19 | Crank, Bell | 24.03 | 1 | ea |
| 20 | Link | 9.01 | 2 | ea |
| 21 | Tube | 1.16 | 1 | ea |
| 22 | Cap, Nose | 0.37 | 1 | ea |
| 23 | Spacer, Frame | 1.75 | 3 | ea |
| 24 | Tube, Frame | 33.07 | 1 | ea |
| 25 | Shaft | 30.72 | 1 | ea |
| 26 | Retainer, Shaft | 1.01 | 1 | ea |
| 27 | Washer, Lock | 0.00171 | 2 | ea |
| 28 | Bolt, Hex Head | 0.0855 | 2 | ea |
| 29 | Bracket, Hose Large | 0.98 | 1 | ea |
| 30 | Bracket, Hose Small | 0.64 | 1 | ea |
| 31 | Bolt, Hex | 0.15 | 1 | ea |
| 32 | Nut, Hex | 0.085 | 1 | ea |
| 33 | Washer, Flat | 0.028 | 1 | ea |
| 34 | Bolt, Hex Head | 0.07 | 1 | ea |
| 35 | Washer, Flat | 0.005 | 2 | ea |
| 36 | Nut, Hex | 0.013 | 1 | ea |
| 37 | Assy, Solenoid Valve | 13.04 | 1 | ea |
| 38 | Bushing | 0.13 | 6 | ea |
| 39 | Bolt, Pivot | 2.16 | 2 | ea |
| 40 | Washer, Lock | 0.32 | 2 | ea |
| 41 | Brace, Bell Crank | 6.89 | 1 | ea |
| 42 | Tie, Cable | .001 | 14 | ea |
| 43 | Bolt, Hex Head | 1.1443 | 1 | ea |
| 44 | Nut, Hex | 0.184 | 1 | ea |
| 45 | Zerk, Grease | 0.01 | 11 | ea |
| 46 | Kit, HTC Decal | 0 | 1 | ea |
| 47 | Stiffener, Blade | 2.29 | 2 | ea |
| 48 | Nut, Hex | 0.013 | 2 | ea |
| 49 | Coupler, Flat Hyd Female | 1.42 | 1 | ea |
| 50 | Coupler, Flat Hyd Male | 0.82 | 1 | ea |
| 51 | Plate, Tread | 0.18 | 1 | ea |
| 52 | Cylinder, Hydraulic | 31.24 | 1 | ea |
| 53 | Cylinder, Hydraulic | 45.48 | 1 | ea |
| 54 | Assy, Supply Hose | 7.20 | 1 | ea |
| 55 | Assy, Tilt Hose | 2.76 | 1 | ea |
| 56 | Assy, Lg Blade Hose TBL1000 | 1.80 | 1 | ea |
| 57 | Assy, Short Blade Hose TBL1000 | 1.52 | 1 | ea |
| 58 | Fitting, 90 Ell | 0.29 | 1 | ea |
| 59 | Screw, Set | 0.009 | 8 | ea |

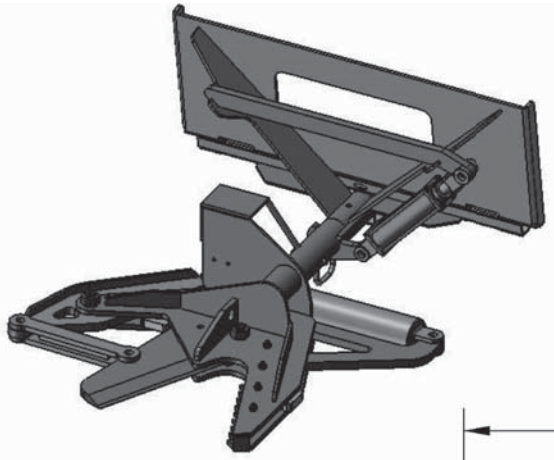
TITLE:

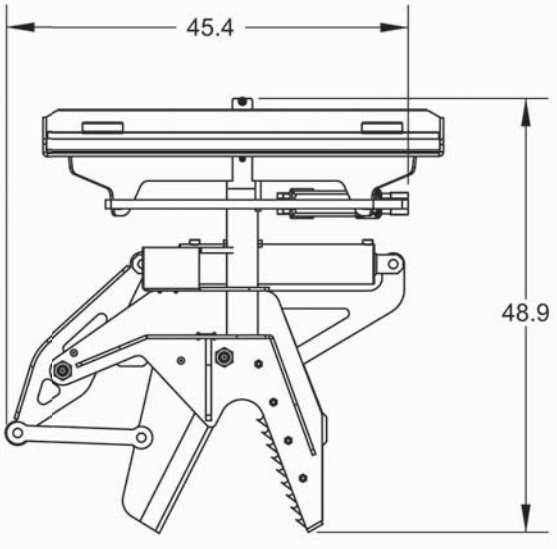
| | NAME | DATE |
|---|---|---|
| DRAWN | RTG | 3 Aug 10 |
| CHECKED | | |
| ENG APPR. | | |
| MFG APPR. | | |
| Q.A. | | |

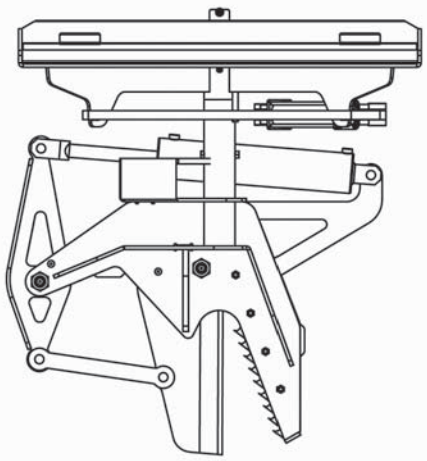
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/16
ANGULAR: MACH ± 1° BEND ±2°
ONE PLACE DECIMAL ±.060
TWO PLACE DECIMAL ±.030
THREE PLACE DECIMAL ±.010
DO NOT SCALE DRAWING

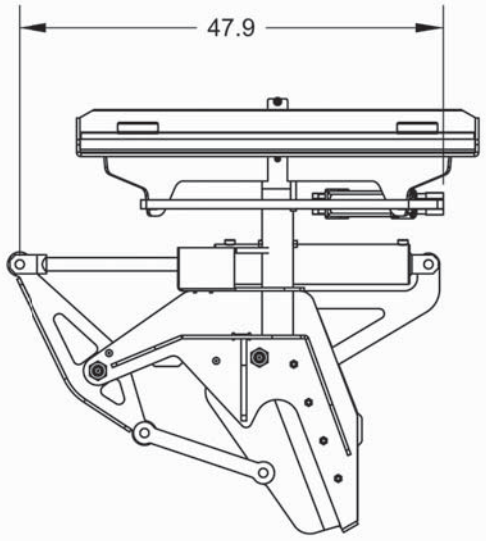
SIZE A | DWG. NO. TBL1010UN Exp | REV 1
28 Apr 14
SCALE: 1:20 | WEIGHT: | SHEET 2 OF 2

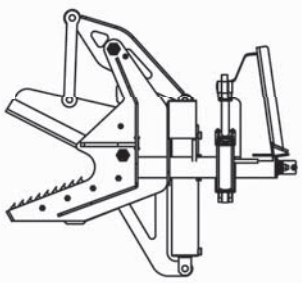
| Rev | By | Date | Description |
|---|---|---|---|

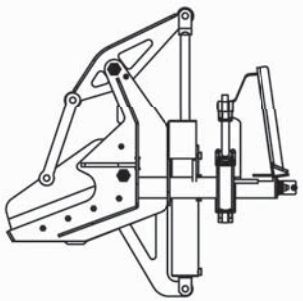








| Rev | By | Date | Description |
|---|---|---|---|
| | | | |

| UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES<br>TOLERANCES:<br>FRACTIONAL ± 1/16<br>ANGULAR: MACH ±1° BEND ±2°<br>ONE PLACE DECIMAL ±.060<br>TWO PLACE DECIMAL ±.030<br>THREE PLACE DECIMAL ±.010 | DRAWN | RTG | 1 Oct 07 |
| | CHECKED | | |
| | ENG APPR. | | |
| | MFG APPR. | | |
| DO NOT SCALE DRAWING | Q.A. | | |

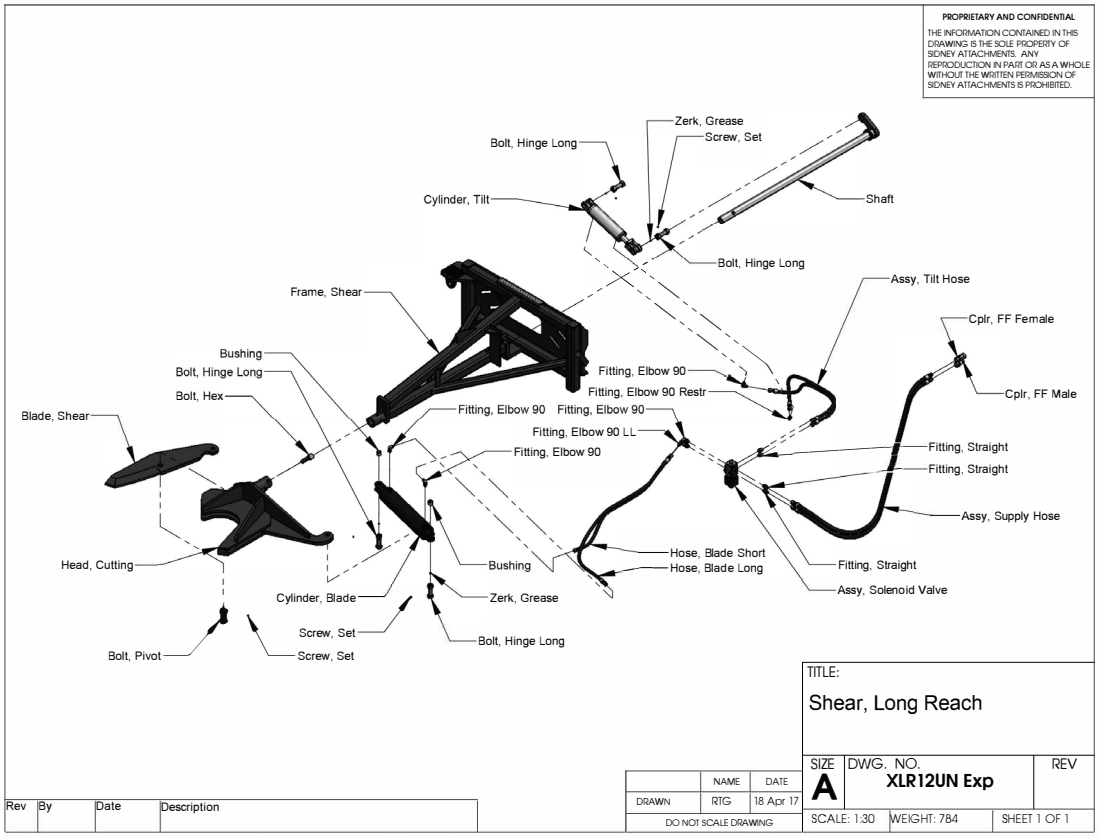
TITLE:

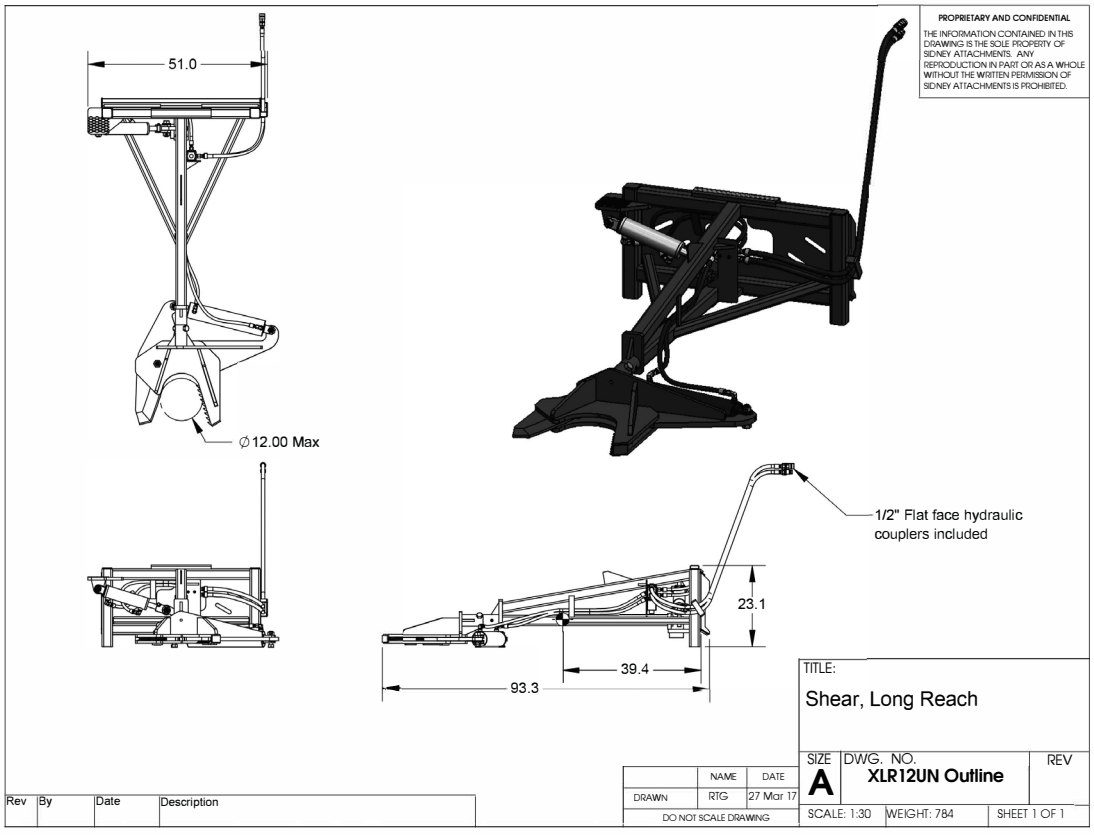
# Shear, Tree 10

| SIZE | DWG. NO. | REV |
|---|---|---|
| A | **TBL1000UN Outline** | |

| SCALE: 1:20 | WEIGHT: 574.17 | SHEET 1 OF 1 |
|---|---|---|

# Arrow Tree Shear - XLR12UN



# Tree Shear Safety

Felling trees, regardless of the method used, involves certain risks which must be identified, evaluated, and mitigated. Properly used, tree shears can be among the safest, cleanest, and efficient ways to cut trees. OSHA regulates logging operations under 29 CFR 1910.266, and it is worthwhile to review and understand those rules even if you are simply using your tree shear to remove a tree in your yard. You can find them at www.osha.gov on the Internet by using their search function to look for “1910.266” once the OSHA web site loads.

Your safety is of prime concern to Arrow Material Handling, and to help you understand your tree shear and to operate it safely, we have published the recommendations in this manual. If you have any questions or comments, we are available to take your call (866 567-9618) and are interested in assisting you.

## Preparing to use a tree shear

Preparation is essential to avoiding or minimizing what may otherwise become a dangerous situation. Please consider the following:

1. Inspect your machine according to the manufacturer’s recommendations for items such as:
    a. Tire pressure
    b. Proper fl uid levels
    c. Damage
    d. Ensure that ROPS/FOPS and operator protection complies with standards for forestry use.
2. Inspect your tree shear using the inspection schedule in this manual.
3. Provide a properly serviced fi re extinguisher on the machine.
4. Consider bringing the following items into the cab of the machine while operating the shear:
    a. Communication device (cell phone, 2-way radio, CB, etc.)
    b. First aid kit (see kit contents guide in this manual)
    c. Ensure that these items are securely stowed and cannot interfere with machine controls
5. Personal protective equipment may be required. Felled trees often have sharp edges, tripping hazards, and unstable surfaces.
    a. Steel toed boots
    b. Work gloves
    c. Safety glasses
    d. Perform a Hazard Assessment to determine if further PPE is needed
6. Arrow recommends working with a spotter to increase situational awareness.

During cutting,the spotter must not be closer to the machine than 2 times the height of the tree. Leave more room if the terrain or other conditions may cause the tree to roll or slide.

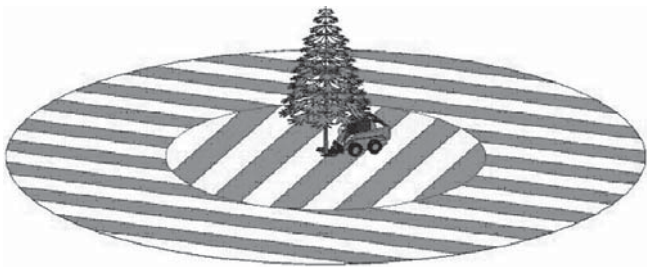


Figure 1: Hazard Zone per OSHA 29 CFR 1910.266{d)(G)(i i)

# Tree Shear Safety

## OSHA 1910.266 Appendix A - First-aid Kits

Source: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9863. Accessed: 16 Dec 09

The first-aid kit information below was directly obtained from OSHA regulations. Having a kit available at the job site is required by OSHA for logging operations and is highly recommended by Arrow Material Handling.

> The following list sets forth the minimally acceptable number and type of first-aid supplies for first-aid kits required under paragraph (d)(2) of the logging standard. The contents of the first-aid kit listed should be adequate for small work sites, consisting of approximately two to three employees. When larger operations or multiple operations are being conducted at the same location, additional first-aid kits should be provided at the work site or additional quantities of supplies should be included in the first-aid kits:
>
> 1. Gauze pads (at least 4 x 4 inches).
> 2. Two large gauze pads (at least 8 x 10 inches).
> 3. Box adhesive bandages (band-aids).
> 4. One package gauze roller bandage at least 2 inches wide.
> 5. Two triangular bandages.
> 6. Wound cleaning agent such as sealed moistened towelettes.
> 7. Scissors.
> 8. At least one blanket.
> 9. Tweezers.
> 10. Adhesive tape.
> 11. Latex gloves.
> 12. Equipment such as resuscitation bag, airway, or pocket mask.
> 13. Two elastic wraps.
> 14. Splint.
> 15. Directions for requesting emergency assistance.

# Tree Shear Safety

## Tree Shear Inspection Checklist

This checklist is to be completed prior to every use of the tree shear. DO NOT use a tree shear that fails inspection until it has been repaired.

Check for damaged hoses or hydraulic leaks. See hydraulic safety precautions in this manual.

Grease all lubrication points. See lubrication point diagram in this manual.

Check the blade cutting edge. Note: minor blade damage will not affect the operation of the shear. Dress with a grinder periodically.

Check for cracked welds.

Check for bent or damaged components.

Check for damaged cylinder pins.

Check for missing or loose fasteners (bolts, nuts, snap rings, etc.)

---

Inspector Name Date

*** * * IMPORTANT * * ***

If you are using your tree shear as part of a commercial operation it is HIGHLY recommended that you keep a copy of all inspections performed on the machine and the tree shear. Also maintain records of repairs that are performed as a result of failed inspections. OSHA inspectors will likely ask for proof that you are taking steps to mitigate risks and to comply with OSHA regulations.
Refer to www.osha.gov on the Internet and search for “1910.266” to display regulations specific to logging operations.

# Tree Shear Safety

## Safely Checking for Hydraulic Leaks

* * *WARNING: There is significant risk of injection from the high pressure spray at hydraulic leaks* * *.

• The tremendous energy used to operate the machine and attachments can be stored in the hydraulic system even when the machine engine is off.

• Very serious injuries from hydraulic fluid injection can seem insignificant at first. Often it can seem like a pin prick or tingling, but later it may require amputation. HIGH PRESSURE LEAKS ARE OFTEN INVISIBLE.

• Hydraulic system injuries can include:
  o Burns from hot fluid
  o Injection of hydraulic fluid
  o Trauma from energized components or flailing lines

| DO | DO NOT |
|---|---|
| • Always Lock Out Tag Out machine controls before working on the machine or attachment.<br>• Always use the methods recommended by the manufacturer to block loader arms and other moving components to prevent accidental movement.<br>• Always use appropriate PPE (Personal Protective Equipment) when working on/ around machinery.<br>• Take an approved safety course related to hydraulic systems. Local university extension programs and equipment dealers will offer training on hydraulic safety. | • DO NOT use your hands, or other body parts, to inspect for hydraulic leaks.<br>• DO NOT position yourself in pinch points when the machine has not been properly blocked, locked out and tagged out.<br>• DO NOT “crack” a hydraulic fitting to release hydraulic pressure. Severe risk of injection.<br>• DO NOT tighten or loosen hydraulic components when the system is pressurized.<br>• DO NOT assume that the system is depressurized. |

# Tree Shear Safety

## Safety During Operations

The operator must exercise judgment and experience when cutting trees with a tree shear. Conditions at the job site vary widely and the ability to recognize and avoid hazards is important. Below are recommendations based upon the intended use of a tree shear.

**Cut at ground level - do not leave a tall stump**

**Good Cut**

**Bad Cut**

**Keep loads centered**
**And do not exceed lift capacity of machine**

**Tipping Hazard**
**Overstressed Tree**

# Tree Shear Safety

## Safety During Operations (continued)

**Be aware of conditions affecting direction of fall**

- Trees typically fall in the direction of shear blade travel
- Some conditions cause the tree to fall elsewhere such as
  - o Wind
  - o Sloping ground
  - o Tree trunk not vertical
  - o Obstructions such other trees
- Position the machine to avoid trees falling overhead

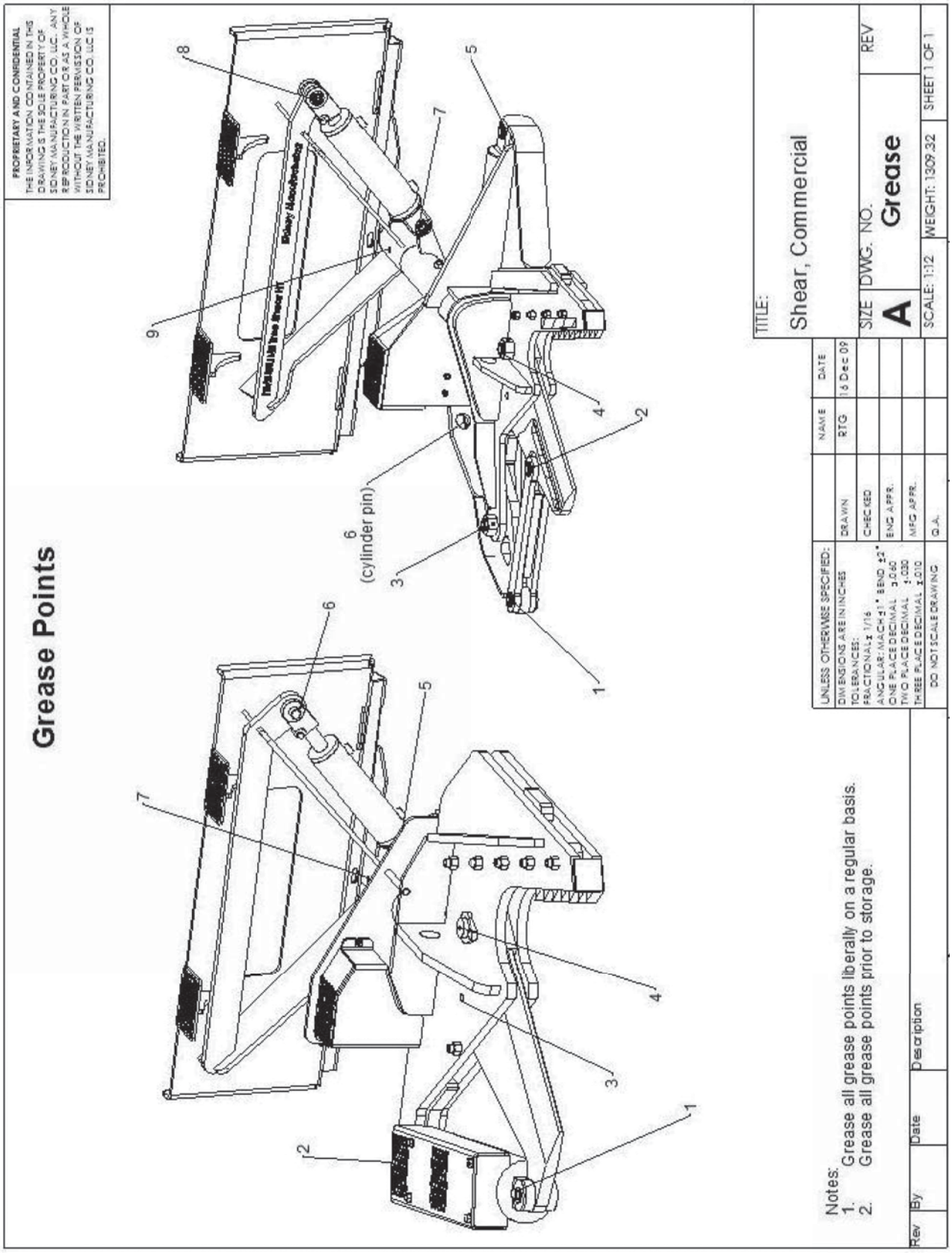
**Backhoes and Excavators:**
**Drag the tree closer to increase lift capacity before lifting**

**Draw the load close and center it before lifting**

**Beware of "Strain Energy"**

- Trees and branches under a load are like compressed springs
  - o Leaning trees
  - o Heavy branches
- The energy released when the support is cut can be significant
  - o Thrown objects (not just the tree)
  - o Trunk or branches springing suddenly

# Tree Shear Safety



CustServ@arrowmhp.com
913-495-4803
16000 West 108th St., Lenexa, KS 66219

## Limited Warranty

The goal of Arrow Material Handling ("Arrow") warranty policy is to assure confidence, reduce downtime and minimize cost of ownership. Should you want to verify warranty, or should potential issues arise, please contact your authorized dealer or Arrow's Customer Service Team at CustServ@arrowmhp.com or 913-495-4803 and we will strive to resolve any issues in a timely manner.

Arrow Material Handling ("Arrow") offers a Limited Warranty on Shear, Grapple, and Puller Attachments delivered hereunder against faulty workmanship and use of defective materials for a period of twenty four (24) months from the date of shipment to the original purchaser from Arrow and/or Arrow Authorized Dealers. Arrow offers a Limited Warranty on Saw Attachments against faulty design, material, and workmanship for normal use when properly maintained for a period of twelve (12) months from date of shipment. The Warranty for all products listed above and delivered hereunder to Rental users is for a period of six (6) months from the date of shipment to the original purchaser. Seller offers a Limited Warranty for miscellaneous parts and accessories such as cylinders, hoses, switches, valves and wiring delivered hereunder against faulty workmanship and use of defective materials for a period of three (3) months from the date of shipment. This warranty does not include, and there in hereby excludes, maintenance parts and consumables including but not limited to hydraulic fluid, oil, belts, teeth, blades, filters and other similar items.

Arrow offers a Limited Warranty on Auger Attachments against faulty design, material, and workmanship for normal use when properly maintained. Auger Gearboxes are warranted for a period of sixty (60) months from date of shipment, Auger Motors are warranted for twenty four (24) months from date of shipment. Auger Bits, Frames and Cradles are warranted for a period of twelve (12) months from date of shipment. Refer to the Product Manual for proper maintenance procedures. Spare, Replacement and After Warranty Parts including hoses and components are warranted for three (3) months. Arrow Auger Teeth, Pilots, Adaptors and Extensions are manufactured with a patented design to interface with Arrow Auger attachments extensions and adaptors. The use of attachments other than Arrow Auger Teeth, Pilots, attachments, extensions and/or adaptors, will void all warranty on Auger Drive and Bits. The use of Arrow adaptors on unapproved attachments is not sanctioned. A "home-made" or non-standard attachment outside the specifications for the machine will void the warranty.
Warranty coverage has the following exclusions: The original purchaser is responsible for and must bear the cost of: Normal maintenance of the products such as lubrication, bleeding / air removal, minor adjustments, etc. Transportation of defective part(s) to and from Arrow or such place where warranty work is being performed. This warranty does not cover any damage to any machine the Arrow product is attached to nor subjected to falling trees or limbs, flying debris, hydraulic component damage. This warranty does not include and there in hereby excludes all normal wear, maintenance and consumable items including, but not be limited to blades, carbide inserts, saw teeth, pilots, wear shoes, bolts in wear areas, bearings and seals.

Warranty begins on the date of shipment to the original purchaser. All claims for warranty policy must be accompanied by a copy of the original sales receipt and must be made to Arrow in writing within ten calendar (10) days after the occurrence. Any claim after the ten (10) days will automatically invalidate the warranty claim. Disassembly, modification or welding of products without Arrow's written authorization voids the warranty. Hydraulic hoses are warranted against failure due to workmanship. Improper installation, ripping or cutting due to unauthorized modifications of Arrow installation or operating procedures is not warranted. An Authorized Dealer or Arrow representative must install hydraulic kits and components for failures to be given warranty consideration.

No warranties are expressed or implied as to the fitness of the equipment on which the product, attachment or accessory is installed. The purchaser will be responsible for promptly informing Arrow Customer Service of any perceived operational deficiencies or failures. Arrow will be the sole party responsible for analysis of perceived deficiencies or failures.

Special Order Products which do not fit because of incorrectly provided specifications are not returnable, are not covered by this limited warranty and constitute the property of the purchaser. Product and part replacement or repair will be at the discretion of Arrow. In some cases, Arrow may approve field repairs in writing by technicians in the field. Compensation for field repairs may be negotiated. Field repairs undertaken without approval by Arrow Customer Service will void the warranty. Arrow will not be responsible for consequential damages, such as loss of business, rental, travel or other expenses. Please see details below.

Continued on Next Page

CustServ@arrowmhp.com
913-495-4803
16000 West 108th St., Lenexa, KS 66219

## General

All Arrow Limited Warranties are extended only to the original purchaser in the U.S. and may be void in the event that the product is sold or otherwise transferred. No warranty will apply to any product that been (i) modified, altered or adapted without Arrow's written consent, (ii) abused or misused, (iii) repaired by any third party in a manner which fails to meet Arrow's repair standards, (iv) improperly installed, (v) used without a proper functioning case drain, (vi) modified to defeat the motor protection valve, (vii) used with any device or implement not covered by this warranty, or used outside of the United States.

The selling dealer makes no warranty of its own and the dealer has no authority to make any representation or promise on behalf of DFM, or to modify the terms or limitations of this warranty in any way.

THE WARRANTIES SET FORTH HEREIN ARE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE PURCHASER ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS OR WARRANTIES WERE MADE OR RELIED ON IN CONNECTION WITH THE PURCHASE OF THE PRODUCTS. NO PERSON IS AUTHORIZED TO VARY, MODIFY OR CHANGE THE TERMS OF THIS LIMITED WARRANTY. NEITHER PARTY SHALL BE LIABLE FOR ANY INDIRECT, PUNITIVE, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGE IN CONNECTION WITH OR ARIS1NG OUT OF THE USE OF THE PROPERTY SOLD TO THE PURCHASER INCLUDING WITHOUT LIMITATION LOSS OF BUSINESS, RETROFITS, GOODWILL OR CONSEQUENTIAL DAMAGES WHETHER IN CONTRACT OR TORT, INCLUDING NEGLIGENCE.

Nothing in this Warranty affects any statutory rights of consumers or other purchasers that cannot be waived or limited by contract. This limited warranty gives you specific legal rights, and you may have other rights which vary from state to state. Please refer to Arrow's Terms and Conditions of Sale on the website for additional information.

## Product Returns

Product being returned for any reason must be approved prior to shipment by Arrow Customer Service. Prior to returning any Product, sender shall first contact Arrow and request a "Return Authorization (RA) Number" so the name and place of potential return or repair can be determined. To initiate a return, contact Arrow's Customer Service Team at 913-495-4803 or via email at CustServ@arrowmhp.com

All returns must be shipped Pre Paid with the RA Number prominently displayed on the Bill of Lading and/or Packing Slip. Non-pre-paid returns, or returns without an RA number will be refused at the dock. Unauthorized returns may be reshipped to the customer freight-collect. Items not returned within thirty (30) days of the issuance of the Return Authorization will not be accepted.

**Returns & Repairs: Warranty**

In the event that a Product does not comply with published operating specifications due to defective materials or workmanship, and is returned to Arrow within the warranty period freight prepaid, Arrow will repair or replace such non-conforming Product at no additional charge.

Warranty service must be performed by Arrow, a dealer or service center authorized by Arrow to sell and/or service the type of product involved, which will use only new or remanufactured parts or components furnished by Arrow. Warranty service will be performed without charge to the purchaser for parts or labor. The purchaser will be responsible, however, for any service call and/or transportation of product to and from the dealer's or service center's place of business, for any premium charged for overtime labor requested by the purchaser, and for any service and/or maintenance not directly related to any defect covered under the warranty as described in this document.

**Returns: Non-Warranty**

Standard Stocking Product: Arrow may, at its own discretion, accept material returns for unused or unopened standard stocking not-obsolete product shipped from a Arrow facility within ninety (90) days. Product must be in original packaging, in good condition and not requiring touch-up or repair. Restocking of returns are subject to a minimum 20% restocking fee. Please use the return procedure described above. Depending on condition and item status Arrow may offer full credit against the purchase less a minimum twenty percent (20%) handling and restocking fee.

Non-Standard, Non-Stocked, Modified or Special Ordered Product: Any Product purchased, made, modified, purchased or specially built to customer's specifications are non-cancelable and non-returnable. Custom manufactured attachments that do not fit because of incorrectly provided specifications are both non-cancellable and non-returnable.

# Notes