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## Release/Revisions

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<th>Date</th>
<th>Change Description</th>
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<tr>
<td>Rev. A</td>
<td>7/22/2013</td>
<td>First Release</td>
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The Tie Shear has a pneumatic parking/service brake chamber at each wheel. Parking brakes are spring applied UNTIL air pressure is present to release the brakes to allow machine travel (Yellow knob on control panel). When the parking brakes are released, the service brakes pedal is used to slow/stop the machine while propelling the tie shear down the track.

If there is a diesel engine failure and air tanks are depressurized or there is a malfunction in the pneumatic system, use the procedure below to release the spring applied parking brakes to allow for towing.

With the tie shear on level track, chock ALL wheels to prevent movement.

Verify that all component lock ups are properly installed. Refer Operation Manual Lock Ups Section.

Slowly move the towing machine to the Tie Shear and carefully install the tow bar and its locking pins.

Engage parking brakes on towing machine and leave the engine running.

Turn the Propulsion By Pass Valve counterclockwise 90 degrees to the vertical (TOW) position. This allows hydraulic oil to flow through the Propulsion By Pass Valve to circulate through the propel motors as the tie shear is towed.

Remove the drive chains from the two propel hydraulic motors if towing the Tie Shear long distances.

Remove the protective cover from bottom of each brake chamber.

Remove the parking brake spring release T head screw, washer and nut from each brake chamber.

Insert T Head screw into the slot at the bottom of brake chamber and turn ⅛ turn clockwise to engage into the diaphragm plate.

Hold the T- screw in place while installing the washer and nut.

Tighten T screw clockwise until the brake shoe is clear of at each wheel.

Carefully remove the wheel chocks and begin the towing operation SLOWLY.
Manually release procedure for parking brakes
Page 2 of 2

EXERCISE CAUTION WHEN TOWING MACHINERY & ALLOW EXTRA STOPPING DISTANCE WHEN TOWING THIS MACHINE. REDUCE SPEED ACCORDINGLY AS DICTATED BY WEATHER OR TRACK CONDITIONS. MAXIMUM TOWING SPEED IS 20 MILES PER HOUR!

After the tie shear has been towed to new location, set the parking brakes and turn the engine off on the towing machine.

Install chock blocks at the Tie Shear wheels.

Remove the T Head screw, washer, and nut from the slot at the bottom of the 4 brake chambers.

Install each T Head screw, washer, and nut assembly to their storage location on each brake chamber.

Remove the tow bar locking pins and the tow bar between the machines.

Turn the Propulsion By Pass Valve clockwise 90 degrees to the horizontal (WORK) position. This blocks hydraulic oil from flowing through the Propulsion By Pass Valve.

The towing by-pass valve is equipped with a lockout device. This lockout prevents the valve from being opened or closed without the operator’s knowledge.

Install the Tie Shear propel drive chains if removed.
Brake Lockout System (Option)
Emergency procedure for releasing parking brakes Page 1 of 2

The Tie Shear has a pneumatic parking/service brake chamber at each wheel. Parking brakes are spring applied UNTIL air pressure is present to release the brakes to allow machine travel (Yellow knob on control panel). When the parking brakes are released, the service brakes pedal is used to slow/stop the machine while propelling the tie shear down the track.

If there is a diesel engine failure and air tanks are depressurized or there is a malfunction in the pneumatic system, use the procedure below to release the spring applied parking brakes to allow for towing.

With the tie shear on level track, chock ALL wheels to prevent movement.

Verify all component lock ups are properly installed.
(Refer Operation Manual Lock Ups Section.)

Slowly move towing machine to the Tie Shear and carefully install the tow bar and its locking pins.

Engage parking brakes on towing machine and leave it running.

Turn the Propulsion By Pass Valve counterclockwise 90 degrees to the vertical (TOW) position. This allows hydraulic oil to flow through the Propulsion By Pass Valve to circulate through the propel motors as the tie shear is towed.

Remove the drive chains from the two propel hydraulic motors if towing the Tie Shear long distances.

Turn the parking brake supply shut off valve to the CLOSED position (handle will be perpendicular to the flow of the air line), to prevent the purge valve from venting. The parking brake supply shut off valve is located on the inside of the frame behind the propulsion manifold.

Connect a pneumatic hose from the towing machine to the tie shear brake lockout male quick disconnect mounted under the propulsion manifold at rear of the tie shear (right side).

OPEN the normally closed brake lockout system ball valve.

In the tie shear cab, when the air pressure is high enough, push the yellow parking brake valve IN to release the parking brakes.

Check that the brakes shoes are now released from the wheels.

a. CLOSE the brake lockout system ball valve and remove the external supply pneumatic hose.

OR

b. Leave the external supply hose connected and leave the brake lockout system ball valve OPEN.
Brake Lockout System (Option)

Emergency procedure for releasing parking brakes Page 2 of 2

Check that there is no air leakage in the pneumatic circuit on the tie shear before continuing on with towing. If air is leaking slowly the parking brakes may apply during towing operation.

Carefully remove the wheel chocks and begin the towing operation SLOWLY.

**EXERCISE CAUTION WHEN TOWING MACHINERY & ALLOW EXTRA STOPPING DISTANCE WHEN TOWING THIS MACHINE. REDUCE SPEED ACCORDINGLY AS DICTATED BY WEATHER OR TRACK CONDITIONS. MAXIMUM TOWING SPEED IS 20 MILES PER HOUR!**

After the tie shear has been towed to new location, set the parking brakes and turn the engine off on the towing machine.

Install chock blocks at the Tie Shear wheels.

CLOSE the normal closed brake lockout system ball valve and disconnect the pneumatic hose from the towing machine to the brake lockout disconnect mounted under the propulsion manifold at rear of the tie shear (right side).

Turn the brake supply purge valve to the OPEN position (handle in line with flow through valve). This will allow the parking brake to vent (position for normal machine operation).

Remove the tow locking pins and tow bar between the machines and store the tow bar in its proper location.

Turn the Propulsion By Pass Valve clockwise 90 degrees to the horizontal **WORK** position. This blocks hydraulic oil from flowing through the Propulsion By Pass Valve.

The towing by-pass valve is equipped with a lockout device. This lockout prevents the valve from being opened or closed without the operator’s knowledge.

Install Tie Shear propel drive chains if removed.
Tie Shear Pneumatic Component Locations
Page 1 of 2 Engine/Cab Section

Switch Pressure (Brake Lights)
7889 6003

Valve Leveling (N C)
24V 1698856
Breather Vent 21880025

Springs Air 5027 8000

Valve Spring Height 1697 905

Chamber Brake 2179 0046

Valve Solenoid N.C. (24V)
Service/Deadman 1698857

Lanyard

Dryer Air 3085 0012
Desiccant 3894 449

Relief Air 1616 190

Tank Purge 79142650

Valve Drain 1697 922

Reservoir Air 7914 4660

Governor

Compressor Air

Springs Air 5027 8000

Exhaust Air (Brakes) 1603 975

Breather Vent 21880021

CAB CONTROL PANEL
Valve Parking Brake 1697723
Switch Low Pressure 78896001
Breather Vent 21880600
Tie Shear Pneumatic Component Locations
Page 2 of 2  Front Section

Springs Air 5027 8000

Chamber Brake 2179 0046

Valve Spring Height 1697 905

Exhaust Air (Brakes) 1603 975

Valve Leveling N C (24V) 1698856

Breather

Vent Breather 2188 0025

Chamber Brake 2179 0046

Springs Air 5027 8000
PNEUMATIC REPAIRS/ADJUSTMENTS – GENERAL

Follow the procedures established for your company’s lockout/tagout procedures of energy isolating devices whenever maintenance is done. It has to be done before performing any repairs where release of pressurized air or unexpected start-up of the machine could cause injury.

See LOCKOUT/TAGOUT REQUIREMENTS in the Safety Section of the Operating & Maintenance Manual for a chart on energy sources located on this machine.

Only trained and authorized personnel should be allowed to operate and/or repair the Tie Shear.

If you are unsure of any of the tasks listed in this document, consult your Supervisor and always refer to the Operating and Maintenance Manual for the Tie Shear.

For tasks beyond a machine operator’s knowledge, experience and training, the machine operator must seek assistance from a supervisor, a trained mechanic, or other “qualified” person.

Prior to performing any maintenance conduct a job briefings with any additional persons involved including those on adjacent equipment.

Air pressure to the various devices in the pneumatic system is controlled by the Air Compressor governor, Turbo 2000 Air Dryer, and the Pressure Relief Valve. It is important for the proper operation of the Tie Shear those pressures are maintained at the correct levels as shown below. Adjustments may also be necessary anytime the machine is not operating normally. Test and adjust pressure as shown on the following pages.

Before performing these checks, read and understand all OPERATION instructions, warnings and cautions. These testing procedures require at least two workers in order to be performed correctly.

All repairs/adjustments to pneumatic circuit should be performed with the machine’s PARKING BRAKES ON and the wheels chocked.

Never attempt to test or service any component in the pneumatic circuit until you have read and understand all procedures.

Always wear eye protection when testing or repairing any component in the pneumatic circuit.

PRESSURE SETTINGS

Air Compressor Governor ................................................................. 120 PSI
Air Circuit Pressure Relief Valve ......................................................... 150 PSI

Always turn off the Tie Shear when performing maintenance, making adjustments, or whenever unintended movement of machine could occur; unless directed otherwise.

Ensure that all AIR PRESSURE is released from the air system before opening any fittings, hose connection, or component in any air horn / brake circuit.

Failure to comply could result in personal injury and/or damage to the machine.
Releasing Air Pressure

![Two Lanyards](image)

**WARNING**

Ensure that all AIR PRESSURE is released from the air system before opening any fittings, hose connection, or component in any air horn / brake circuit.

To drain the pressurized air from the pneumatic circuit and air tanks.

Turn off the engine.

Pull and hold the two lanyards located on the tie shear’s right side in front of air dryer.

The lanyards go to a manual drain valve located on the bottom of each air tank (2).

Let go of lanyards when the sound of air escaping stops.

Removing Water from Air Tanks

![Manual Drain Valves](image)

To check for and to remove water from the air tanks.

Turn off the engine.

Pull both lanyards that go to the manual drains located on the bottom of the air tanks.

As air is released, observe for water/mist and that the water stops appearing in a mist before air tank is empty.

The air tanks need to be drained daily, especially on humid/rainy days.
When checking or adjusting the air compressor governor pressure setting use an accurate test gauge (0-200 psi) that is registering accurately in 5 psi increments.

Start engine and watch the air pressure gauge located on the engine control panel.

Note the point at which the air pressure stops rising on the gauge.

The CUT-OFF governor setting of 120 psi is required for Tie Shear pneumatic component operations.

**If air compressor governor pressure setting is BELOW 120 PSI.**

The air compressor governor is located at the air compressor that is driven by and located on the left side of the diesel engine.

Remove the air compressor governor adjusting screw protection cap.

Loosen the air compressor governor adjusting screw lock nut.

Turn the air compressor governor adjusting screw counterclockwise ¼ of a turn and recheck pressure by releasing air at the air tank until pressure on gauge begins to rise.

Check for 120 psi when the air compressor governor unloads, adjust further if needed.

Tighten the air compressor governor adjusting screw lock nut.

Reinstall the air compressor governor adjusting screw protection cap.

**If the air compressor governor pressure setting is above 120 PSI.**

The air compressor governor is located at the air compressor that is driven by and located on the left side of the diesel engine.

Remove the air compressor governor adjusting screw protection cap.

Loosen the air compressor governor adjusting screw lock nut.

Turn the adjusting screw clockwise ¼ of a turn and recheck pressure by releasing air at the air tank until pressure on gauges begins to rise.
Check for 120 psi when the air compressor governor unloads, adjust further if needed.

Tighten the air compressor governor adjusting screw lock nut.

Reinstall the air compressor governor adjusting screw protection cap.

The governor cut-in pressure is around 90 psi and is non adjustable.

If problems develop with setting the cut out pressure (115 psi), or the cut in pressure of (90 psi) is off, repair, rebuild, or replace the governor.
Pneumatic Circuit Pressure Relief Valve

Mounted on the right side of the rear air tank (behind the air dryer) is a pneumatic circuit pressure relief valve.

The purpose of this valve is to protect the tie shear pneumatic components from an excessive build up of air pressure during air compressor operation.

The pneumatic circuit pressure relief valve is nonadjustable and is factory set to 150 psi.

If air is being released from the pneumatic circuit pressure relief valve.

First check that the system air pressure is set to 120 psi maximum. If not, see instructions for setting the air compressor governor.

Start the engine and watch the air pressure gauge located on the engine control panel.

The CUT-OFF governor setting of 120 psi.

Push the pneumatic circuit pressure relief valve stem toward one side, air should exhaust, release the stem, the air flow should stop.

Failure of pneumatic circuit pressure relief valve to seat properly indicates a bad seat, weak spring, or debris in the valve.

Turn off the diesel engine

Pull both lanyards going to both air tanks. The lanyards are located on the rear right side of machine in front of air dryer to drain pressurized air from the pneumatic circuit.

Ensure that all air pressure is released from the air system before opening any fittings, hose connection, or component on the air horn / brake system.

Remove the pressure relief valve, clean out, install and retest.

If the pneumatic circuit valve fails test replace the pressure relief valve.
## Pneumatic Pressure Relief Valve Leakage Test

<table>
<thead>
<tr>
<th>Pneumatic Circuit Pressure Relief</th>
<th>Start engine and watch the air pressure gauge located on the engine control panel. The CUT-OFF governor setting of 120 psi.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Turn off the diesel engine</td>
</tr>
<tr>
<td></td>
<td>Coat the pneumatic circuit pressure relief valve with a soapy water solution.</td>
</tr>
<tr>
<td></td>
<td>A leakage of a one inch bubble in 5 seconds is OK.</td>
</tr>
<tr>
<td></td>
<td>Failure of valve indicates bad seat, weak spring, or debris in the valve.</td>
</tr>
<tr>
<td></td>
<td>Turn off the engine</td>
</tr>
<tr>
<td></td>
<td>Release the stored air pressure in both tanks.</td>
</tr>
<tr>
<td><strong>WARNING</strong></td>
<td><strong>Ensure that all air pressure is released from the air system before opening any fittings, hose connection, or component on the air horn / brake system.</strong></td>
</tr>
<tr>
<td></td>
<td>Remove the pressure relief valve, clean out, install and retest.</td>
</tr>
<tr>
<td></td>
<td>If the pneumatic circuit valve fails test replace the pressure relief valve.</td>
</tr>
</tbody>
</table>
Check / Replace Air Dryer Desiccant

Located behind the engine, on the right side of the machine, below the main frame. The desiccant media in the air drier removes water from the compressed air. Normally the desiccant will last a year and should be changed then. If excessive water or oil is collecting in the air tank(s), the desiccant cartridge should be replaced.

Turn off the engine.

Pull both lanyards going to both air tanks. The lanyards are located on the rear right side of machine in front of air dryer to drain pressurized air from the pneumatic circuit.

**WARNING**

Ensure that all AIR PRESSURE is released from the air system before proceeding!

Using a strap wrench, turn the desiccant cartridge counterclockwise, remove and discard.

If the canister is difficult to remove or spins without loosening use a thin putty knife and slide it between the cartridge gasket and the base.

Remove and discard o-ring from the adapter stud.

Check valve port, if there is excessive oil, the compressor may require servicing.

Clean top surface of adapter plate and threaded stud with a clean lint free cloth.

Install new o-ring on adapter stud.

Apply a coat of grease on the new desiccant cartridge gasket surface.

Thread new cartridge onto adapter stud and turn clockwise. When gasket contacts adapter plate, tighten cartridge ½ turn.

**DO NOT OVERTIGHTEN!**
Adjusting Brake Shoes

When operating the Tie Shear in high temperature and humid conditions or at high elevation the air compressor may not provide adequate air volume with frequent brake use.

Note that as brake shoes wear, the brake cylinder stroke increases and requires more air volume.

To adjust worn brake shoes:

1. Chock all 4 wheels.
2. Start engine and charge air tanks to operating pressure.
3. Use the parking brakes release valve on the control panel to release the parking brakes.
4. Loosen the jam nut while holding the adjusting nut in its current position.
5. From top looking down the brake chamber output screw, turn the top nut counterclockwise (CCW) to decrease the clearance between shoe and wheel.
6. Adjust the brake adjusting nut so that the retracted brake shoe will clear the wheel about 1/8 of an inch and not drag on the wheel.
7. Tighten the brake adjusting lock nut to while holding the adjusting the brake adjusting nut in place.
8. Test and check the brakes for proper function application and clearance.
Adjusting Air Spring Height

The four air springs inflate when the Work/Travel Switch is in the Travel position.

The spring height valve controls the inflated height of the four air springs. The air spring height valve arm can be adjusted to alter the ride height by turning the turnbuckle.

The distance from the top of the machine’s frame to the bottom of the T bolt screw welded nut should be the same as the bottom of the machine’s frame to the suspension frame when the air bags are inflated.

To INCREASE the amount the air springs will rise on the front or rear of the machine:

Turn off engine and turn the spring height valve turnbuckle lock nuts counterclockwise one full turn.

Remove cotter key and clevis pin from top of turnbuckle assembly.

Turn the spring height valve screw counterclockwise to lengthen the overall length of the turnbuckle assembly on the spring valve assembly.

Reinstall clevis pin in turntable assembly, turn on engine, and place Work/Travel in TRAVEL position.

Check the distance at the top and bottom of frame along the T Bolt for equal distance.

If ok, install cotter pin and tighten both lock nuts to the spring height valve turnbuckle.

To DECREASE the amount the air springs will rise on the front or rear of the machine:

Turn off engine and turn the spring height valve turnbuckle nuts counterclockwise one full turn.

Remove cotter key and clevis pin from top of turnbuckle assembly.

Turn screw clockwise to shorten the overall length of the turnbuckle assembly on the spring valve assembly.

Reinstall clevis pin in turntable assembly, turn on engine, and place Work/Travel in TRAVEL position.

Check the distance at the top and bottom of frame along the T Bolt for equal distance.

If ok, install cotter pin and tighten both lock nuts to the spring height valve turnbuckle.
## PNEUMATICS TROUBLESHOOTING GUIDE

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
</table>
| Air Compressor does not develop pressure in air tanks (120 PSI) | 1. Leak in Air System  
   a. Loose fitting at component  
   b. Broken or disconnected hose  
  2. Engine to air Compressor drive gear damaged  
  3. Drain valve on air tank stuck open  
  4. Air compressor governor faulty or not adjusted properly  
  5. Air tank relief valve stuck open  
  6. Air dryer (option) leaking air at exhaust port | a. Tighten fittings  
  b. Repair or replace Hose  
  2. Inspect, repair or replace  
  3. Remove debris from valve orifice, repair or replace  
  4. Repair or replace  
  5. Remove debris from valve orifice, repair or replace  
  6. Inspect unloader valve in air dryer, repair or replace |
<p>| Air pressure too high in air tanks          | 1. Air compressor governor faulty or not adjusted properly                     | Repair or replace                                                       |
| Water in air system                         | 1. Air dryer (option) desiccant needs changing.                               | 1. Replace desiccant element                                             |
| <strong>Note:</strong> Drain air tanks at the end of a workday, more often in high humidity or after rain | 2. Air tanks not regularly drained                                            | 2. Drain air tanks                                                       |
| Oil in Air system                           | 1. Air dryer desiccant needs changing.                                        | 1. Replace                                                               |
|                                             | 2. Air tanks not regularly drained                                            | 2. Drain air tanks daily                                                 |
|                                             | 3. Air compressor leaking oil internally                                     | 3. Inspect, repair or replace                                            |
| Low air alarm sounds                        | 1. Low air pressure in air tanks                                             | 1. Repair governor air compressor                                       |
|                                             | 2. Defective alarm sender                                                   | 2. Inspect, repair or replace                                            |
|                                             | 3. Frequent braking                                                         |                                                                          |</p>
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumatic Circuit Safety Valve pop’s off excessively</td>
<td>Popping off at system pressure</td>
<td>Drain air out of circuit, remove, inspect, clean out valve seat, or replace safety valve.</td>
</tr>
<tr>
<td>Brakes will not release</td>
<td>1. No air pressure</td>
<td>1. Wait until air pressure is above 70 psi</td>
</tr>
<tr>
<td></td>
<td>2. Damage brake chamber</td>
<td>2. Replace</td>
</tr>
<tr>
<td></td>
<td>3. Electrical Interlock Push In</td>
<td>3. Pull out electrical interlock switch</td>
</tr>
<tr>
<td></td>
<td>4. Parking Brake Applied</td>
<td>4. Pull the Parking Brake Knob to allow pressurize air to build up to release the spring applied emergency/parking brakes.</td>
</tr>
<tr>
<td></td>
<td>5. Deadman/Service Brake controls</td>
<td>5. With the Deadman/Service in the DEADMAN position the brakes are ON when the propulsion pedal is released. With the Deadman/Service in the SERVICE position the brakes are ON when the brake pedal is pushed.</td>
</tr>
<tr>
<td>Travel brakes not engaging</td>
<td>1. Quick release valve not shifting</td>
<td>1. Inspect, repair, or replace valve</td>
</tr>
<tr>
<td></td>
<td>2. Foot pedal valve not working</td>
<td>2. Inspect, repair, or replace valve</td>
</tr>
<tr>
<td></td>
<td>3. Check to see if parking brake is disengaged</td>
<td>a. Inspect, repair, or replace valve</td>
</tr>
<tr>
<td></td>
<td>a. Check parking brake switch</td>
<td>b. Inspect for stuck shuttle and or leakage, repair, or replace.</td>
</tr>
<tr>
<td></td>
<td>b. Check brake shuttle valve</td>
<td>c. Adjust linkage</td>
</tr>
<tr>
<td></td>
<td>(sends air to release parking brakes or to apply service brakes)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Check linkage adjustment</td>
<td></td>
</tr>
<tr>
<td>Travel brakes sluggish application or release</td>
<td>1. Check brake shoe clearance</td>
<td>1. Adjust linkage replace shoes</td>
</tr>
<tr>
<td></td>
<td>2. Oil on shoes</td>
<td>2. Clean shoes or replace</td>
</tr>
<tr>
<td></td>
<td>3. Check chamber return spring</td>
<td>3. Replace brake chamber assembly</td>
</tr>
<tr>
<td>PROBLEM</td>
<td>POSSIBLE CAUSE</td>
<td>SOLUTION</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>A parking brake drags or wont release</td>
<td>1. Improper Adjustment of linkage</td>
<td>1. Adjust linkage</td>
</tr>
<tr>
<td></td>
<td>2. Restriction or broken air line to brake chamber</td>
<td>2. Inspect, repair or replace</td>
</tr>
<tr>
<td></td>
<td>3. Air pressure to low</td>
<td>3. Check air pressure</td>
</tr>
<tr>
<td></td>
<td>4. Broken return spring/ broken power spring in brake chamber</td>
<td>4. Replace chamber</td>
</tr>
</tbody>
</table>