

2000 Series

ETJ OPERATING and SERVICE INSTRUCTION



Serial No. _____ Purchase Date _____

**Do not use the ETJ until the operator has read, and fully understands
the "OPERATING INSTRUCTIONS" section in this Manual.**

July 1, 2004

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OPERATING THE ETJ

Lifting & Lowering Instructions

1. No longer necessary.
2. Connect your **filtered and dry** compressed air supply to the ETJ's Air Regulator (52). Protect your investment! As with any air tool, the ETJ's service life may be shortened by contaminants and moisture being introduced through an improperly filtered shop compressed air supply.
3. Adjust the Air Regulator (52) and turn its knob until the Air Gauge (53) registers:
 - 35-80 psi for working with transmissions, transaxles, power dividers, tanks, etc..
 - 120-160 psi for working with heavy loads such as engine/transaxle/support frame combinations for FWD cars and other light vehicles. The ETJ has been designed to lift all of these assemblies, with as little as 120 psi registered on the Air Gauge, to where the bottom of the load is almost 5 feet above the shop floor ... and most (but not all) can be raised another 20 inches when the Air Gauge registers 145-160 psi. Tests show that with certain large 4WD transmission/transfer combinations connected to the engine, up to 1,100 pounds of force may be necessary to arc the total power train high enough to install or remove the cross member.

Delivered Air PSI	Large Piston Capacity	Small Piston Capacity
40	313	160
80	726	419
120	1,138	679
160	1,558	938

>>>>>>> NOTE! <<<<<<<<

It is always best to set the maximum air pressure 10-20% greater than that which is required to lift the load, **but no higher!** In doing so, shop air is being used efficiently, and the time necessary for the ETJ's Tank (1) to depressurize enough to lower a load will be kept to an absolute minimum.

Never use more than 160 psi air pressure in your ETJ!

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4. For coarse adjustment of the ETJ height, step hard on the right (intake) side of the Foot Valve Control (61) for lifting, or on the left (exhaust) side for lowering. This activates both the Air Valve (47) and one of the Hydraulic Valves (71 or 72) at the same time. Within 0-3 seconds the Pistons (3)(12) will begin their travel smoothly, but briskly. All movement will immediately stop the instant the pressure is taken off the Foot Valve Control.
5. For **fine adjustment** of the ETJ height, step lightly on the right (intake) side of the Foot Valve Control (61) for lifting (or the left (exhaust) side for lowering) until you feel a restriction (the bottom of the Foot Valve Control has now come into contact with the Valve Rocker (77). This activates the Air Valve (47) to pressurize or depressurize the ETJ's Tank (1). Wait 3 seconds; and then begin to increase your foot pressure **slightly** until the Load Piston (3 or 12) begins to travel at the speed you want it to. **A little practice makes perfect!** The 3 second delay is necessary for the Tank air pressure to become greater than that required to raise the load (or to become less than that required to support the load) **before** the Hydraulic Valve (71 or 72) is actuated.
6. The Release Locking Pin (63) may be used when lowering the ETJ height **only when there's no load!** Simply press down completely on the left (exhaust) side of the Foot Valve Control (61) and push in the Pin until it can rest on top of the tab welded onto the side of the Tank (1). While holding the Pin in, release the pressure on the Foot Valve Control. To release the Pin, simply press down on the left (exhaust) side again; and the Pin will return to its original position and allow the Foot Valve Control to return to its.
7. When you take your foot off the Foot Valve Control (61), lift your foot off instead of sliding it off. This prevents the Foot Valve Control from rocking too far the other way and forcing the Air Valve Kicker (80) to "toggle" the Air Valve (47) from an air intake mode to an air exhaust mode or vice versa.
8. The Frame Tank (1) doesn't need to be pressurized in order to maintain the height of a raised load. You may disconnect the shop air anytime **after** the Frame Tank has been depressurized.

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Support Arms Use Instructions

1. If necessary, remove the ETJ-EH Engine Support Head (128) from the Upper Lifting Head (93); and turn the Safety Tie-down Buckle (91) until it points upwards, thereby allowing the Safety Strap (90) to be slung over a transmission or other load.
Always use the Safety Tie-down Strap to secure the load!
2. Attach the Transmission Support Arms (112) to the Upper Lifting Head (93) by following one of the configurations shown in the ETJ Support Arm Assembly Configurations Drawing or through one of your own configurations that meet your needs. **WARNING! The Bolt (110 or 116) must have a thread engagement of at least 7/16" in the Support Arm or the Retaining Nut (114).**

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Engine Support Head Use Instructions

1. If necessary, remove the Transmission Support Arms (112) from the Upper Lifting Head (93); and turn the Safety Tie-down Buckle (91) until it points straight down. Hook the "J" Hook of the Safety Tie-down Strap (90) into the the hole in the Upper Tilt Pivot Pin (91) from beneath; and wrap the excess Strap around the Lower Rocker Weldment (94) to keep it out of the way.
2. Set the ETJ-EH Engine Support Head (128) over the Upper Lifting Head (93) to where the Support Head holes line up with those in the Upper Lifting Head. Push four of the Retaining Bolts (110 or 116) through the Support Head; and then through the Upper Lifting Head. Tighten the Bolts in place with the Nuts (114).

WARNING! The Bolts (110 or 116) must have a thread engagement of at least 7/16" in the Retaining Nuts (114).

3. Always use the two Ratchet Safety Tie-down Straps (130) to secure the load! It is suggested that the Ratchet Safety Tie-down Straps be slung over the engine with the "J" hooks dangling around its bottom prior to raising the vehicle on the hoist.

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MAINTAINING THE ETJ

Monthly Maintenance Schedule

1. Oil both sides of the Upper Tilt Pivot Pin (91) where it comes out of the Upper Lifting Head (93). Tilt the Upper Lifting Head towards the threaded rod that's anchored to it; and oil the Pivot Pin where it pivots on the inside and outside of the Lower Rocker Weldment (94).
2. Oil the Lower Rocker Pin (99) in between the Upper Piston (12) and the Lower Rocker Weldment (94).
3. Inspect both threaded rods that are anchored to the Upper Lifting Head (93) and the Lower Rocker Weldment (94) and make sure they're free from dirt and grit Oil both liberally. If necessary, grease the Pivoting Hex Anchors in both the Upper Lifting Head and the Lower Rocker Weldment at the two Grease Fittings (98).
4. Have both Pistons (3)(12) completely lowered. Wipe off all dirt and debris on top of the Lower Piston (3), the Lower Piston Cap (15) and the Tank Top (6). Now raise both Pistons to their full height. Wipe off any dirt that may be on the "bare" portions of the Pistons. Spread a film of oil on each Piston. Lower both Pistons completely and wipe off any excess oil.
5. Oil the Transport Handle (20) where it pivots on the Transport Handle Pin (19). Squirt a little oil on the center vertical bar of the Air Valve Kicker (80) so the oil will run down onto the Treadle Pivot Pin (65) below.
6. Make sure the Air Valve Cover Bolts (55) and the Spring Compression Plate Bolt (66) haven't become loose. **Do not over-torque!**
7. Press the Foot Valve Control (61) completely down on the right (intake) side; and while its all the way down, squirt a little oil on top of the Intake Valve Stem (72) where it goes into the Valve Base of the Jack's Frame (1). Press down on the left (exhaust) side in the same way and oil the Exhaust Valve Stem (71).
8. Press the Foot Valve Control (61) completely down on the right (intake) side; and while its all the way down, spread grease on top of the toe of the Exhaust Valve Rocker (77) (where it makes contact with the bottom of the Foot Valve Control). While the Foot Valve Control is still all the way down, reach down and try to loosen the Jam Nut (70) by hand that's threaded onto the Exhaust Valve Stem (71). If it turns, you'll need to go through the Valve Stem adjustment steps 11 and 12 found in the **Hydraulic Valve Assembly** section.
9. Do the same basic procedures as in step 8 above for the Intake Valve side.

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Bi-Annual Maintenance Schedule

1. Grease the axle and oil the upper ball bearing race on each one of the Swivel Casters (24). Some may find their ETJ rolls and casters better if they grease and oil the Swivel Casters more often.
2. Lower both Pistons (3)(12) completely. Lower the Frame Tank (1) air pressure to zero. The Foot Valve Control (61) must be in its neutral position with the Release Locking Pin (63) not engaged. Tilt the ETJ towards the side that has the Oil Filler Pipe Plug (28) until the Frame Tank is horizontal. Disconnect the Tank Air Hose (44) from the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank. Place a two gallon capturing pan under the Oil Filler Plug. Unscrew the Plug just enough for any water to flow out. As soon as only oil comes out, re-tighten the Oil Filler Plug. Reconnect the Tank Air Hose to the 90 Degree Elbow Fitting at the top of the Frame Tank. **Do not over-tighten as this can damage the hose end.** Put the ETJ back upright
3. Lower both Pistons (3)(12) **completely**. Lower the Frame Tank (1) air pressure to zero. Unscrew the Oil Filler Pipe Plug (28) on the side of the Frame Tank and check the oil level. If necessary, fill the Tank with Hydraulic Jack Oil, Automatic Transmission Oil, or MIL-H-5606 Hydraulic Fluid until the oil level reaches the bottom of the filler hole. The total oil capacity is 7½ quarts. **Never overfill!** If too much oil is put into the Tank, oil will be exhausted with the air. Replace the Oil Filler Plug.

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Hydraulic Oil Change Schedule

1. The hydraulic oil should be completely changed once every 1 to 5 years-depending on how many contaminants have been introduced into the ETJ through an improperly filtered compressed air system. The ETJ uses 7½ quarts of either Hydraulic Jack Oil, Automatic Transmission Oil, or MIL-H-5606 Hydraulic Fluid.
2. Lower both Pistons (3)(12) completely. Lower the Frame Tank (1) air pressure to zero. The Foot Valve Control (61) must be in its neutral position with the Release Locking Pin (63) not engaged. Tilt the ETJ towards the side that has the Oil Filler Pipe Plug (28) until the Frame Tank is horizontal. Disconnect the Tank Air Hose (44) from the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank. Place a two gallon capturing pan under the Oil Filler Plug. Unscrew the Plug and drain all the oil.
3. Put the ETJ back upright and temporarily tighten the Oil Filler Plug (28) into the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank (1). **Do not over-tighten.**
4. Tilt the ETJ toward the side that has the Air Regulator (52) until the Frame Tank (1) is horizontal. Using a small funnel, pour in **7 quarts** (½ quart less than capacity) of the oil mentioned in step 1 above.

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5. Gently put the ETJ back upright and continue to fill the Frame Tank (1) until the oil level reaches the bottom of the filler hole. Never overfill! If too much oil is put into the Tank, oil will be exhausted with the air.
6. With a shop rag under the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank (1) to catch a little oil, remove the Oil Filler Plug (28) and re-tighten it back into the filler hole on the side of the Frame Tank. Reconnect the Tank Air Hose (44) to the above mentioned 90 Degree Elbow Fitting. **Do not over-tighten as this can damage the hose end.**

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SERVICING THE ETJ

Symptoms & Cures

The Pistons have become "jerky" or "jumpy"!

- **WARNING!** Do not operate the ETJ in this condition!
- The oil level in the ETJ's Tank (1) may have become so low that air now enters the cylinder before the Pistons reach full extension;...or....some of the earlier 2000 Series ETJ's may also take air into the cylinder when the Pistons (3)(12) are raised at full speed through most of their stroke. The air is brought in when the Upper Piston (12) is within two inches of its full extension.
- Remove any load from the top of the Support Arms (112) or Engine Support Head (128). Raise both Pistons (3)(12) slowly to their fully extended position. Step down all the way on the left side of the Foot Valve Control (61) until one of the Pistons lowers about one inch. Slowly unscrew the Air Bleeder Plug (16) at the top of the Lower Piston (3) **just enough** to allow the trapped air to escape. When a steady stream of oil flows out, re-tighten the Air Bleeder Plug.
- Lower both Pistons (3)(12) **completely**. Reduce the Frame Tank (1) air pressure to zero. Unscrew the Oil Filler Pipe Plug (28) on the side of the Frame Tank and fill the Tank with Hydraulic Jack Oil, Automatic Transmission Oil, or MIL-H-5606 Hydraulic Fluid until the oil level reaches the bottom of the filler hole (the total capacity is 7½ quarts).
- If the ETJ took only a small amount of oil, it is advised that the operator refrain from rapidly raising both Pistons (3)(12) to their full extension. Stopping for one to two seconds when the Upper Piston (12) is three to six inches of its full extension will cure the internal vortex phenomenon.
- If the "jerky" or "jumpy" condition returns soon after the corrective measures above are taken a couple of times..., then there may be air or oil bypassing around the Dash 245 O-Ring (5). Check with the factory for potential remedies.

The ETJ will raise the load with the large Lower Piston (3), but not the smaller Upper Piston (12)!

- The most common cause is that the load is too heavy to be raised with the delivered air pressure into the Jack. Increase the delivered air pressure by adjusting the ETJ's Air Regulator (52) upward. The ETJ has been designed to lift heavy loads such as engine/transaxle/support frame combinations with as little as 120 psi registered on the Air Gauge (53), to where the bottom of the load is almost 5 feet above the shop floor....and **most** (but not all) can be raised another 20 inches when the Air Gauge registers 145-160 psi. Tests show that with certain large 4WD transmission/transfer combinations connected to the engine, up to 1,100 pounds of force may be necessary to arc the total power train high enough to install or remove the cross member.

Delivered Air PSI	Large Piston Capacity	Small Piston Capacity
40	313	160
80	726	419
120	1,138	679
160	1,558	938

- The load may be severely off-set. The more a load is off-set, the more the friction will absorb the lifting force.
- There may be a leak in the ETJ's air "piping". Press the Foot Valve Control (61) down on its right (intake) side just enough to "toggle" the Air Valve (47). The Air Regulator (52) should be adjusted to the highest pressure possible—but **not over 160 psi**. Listen for the "hiss" of air escaping, or feel along the air path from the Air Regulator to the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank (1).
- Make sure the Spring Compression Plate Bolt (66) hasn't become loose. Do not over-torque!

The ETJ's Pistons go up way too slowly or not at all....without a load!

- Check the shop air hose for restrictions.
- Check to insure the Air Gauge (53) registers at least 30 psi.
- Grab the Air Valve Kicker (80) just below the bottom of the Air Valve Cover (40). Move the Air Valve Kicker to the left and right several times. Each time you should feel the toggle switch on the Air Valve (47) "click" into position after moving it no more than 1/4 inch. If you don't, something is wrong with the Air Valve, and it should be replaced at once.

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- Disconnect the Air Tank Hose (44) from the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank (1). Thread your 1/4 inch n.p.t. air connector into the Elbow Fitting and connect your shop compressed air directly to the connector (it is recommended that your air pressure not exceed 60 psi for this test). Now press the Foot Valve Control (61) completely down on the right (intake) side. If the Pistons (3)(12) go up normally, you have a blockage in the ETJ's air "piping". The Air Regulator (52) should be checked first.
- Have the Foot Valve Control (61) in the neutral position and the Release Locking Pin (63) not engaged. Check for proper Valve Stem adjustment as shown in the Hydraulic Valve Assembly section, steps 11 and 12.

The ETJ slowly lowers the load steadily when it shouldn't!

- **WARNING!** Do not operate the ETJ in this condition!
- Make sure the Spring Compression Plate Bolt (66) hasn't become loose. Do not over-torque!
- Check for proper Valve Stem adjustment as shown in the **Hydraulic Valve Assembly** section, steps 11 and 12 after the Foot Valve Control (61) is in the neutral position and the Release Locking Pin (63) isn't engaged.
- There might be something between the Ball Bearing (74) and its seat in one of the ports in the Base of the Frame (1). Or the Exhaust Valve Stem (71) may be slightly bent at the o-ring groove and rubbing on the port wall. See the **Hydraulic Valve Removal and Assembly** sections.
- There is the possibility that the Valve Compression Spring (68) is too weak to properly hold the Ball Bearing (74) against the seat to keep the exhaust port (left side) closed when there's no air pressure in the Tank (1).
- There's a slight chance oil in the cylinder is getting past the Dash 245 O-ring (5) when there's no air pressure in the Tank (1).

The ETJ slowly raises the load steadily when it shouldn't!

- **WARNING!** Do not operate the ETJ in this condition!
- There might be something between the Ball Bearing (74) and its seat in one of the ports in the Frame's Valve Base (1). Or the Exhaust Valve Stem (71) may be slightly bent at the o-ring groove and rubbing on the port wall. See the **Hydraulic Valve Removal and Assembly** sections.
- There is the possibility that the Valve Compression Spring (68) is too weak to properly hold the Ball Bearing (74) against the seat to keep the intake port (right side) closed when there's plenty of air pressure in the Tank (1) and no load (or light load) on the ETJ.
- There's a slight chance air in the Tank (1) is getting past the Dash 245 O-ring (5) when there's no load (or a light load) while there's plenty of air pressure in the Tank. If this condition is true, the Pistons (3,12) will also become "jerky" or "jumpy". See the earlier section dealing with this condition.

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Foot Valve Control Assembly

1. Turn the Foot Valve Control (61) upside down.
2. Push the Compression Spring (62) over the small end of the Release Locking Pin (63) and apply a liberal amount of motor oil over the entire Pin assembly.
3. Slide the above assembly into the hole found in the front and side of the Foot Valve Control until the small portion of the Release Locking Pin protrudes through the backside of the Foot Valve Control as far as possible. At this point the Compression Spring should be fully compressed and the large portion of the Release Locking Pin should be recessed beyond the front lip of the Foot Valve Control.
4. Slide the .5" Snap Ring (64) over the large portion of the Release Locking Pin and release the Pin. Gently push the small portion of the Pin until the Snap Ring pops into the groove.
5. Check for free movement of the Release Locking Pin from where the Snap Ring rests against the inside front lip of the Foot Valve Control; and can travel to where the large end of the Pin is flush with the outside front lip of the Foot Valve Control.

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Hydraulic Valve Removal

1. Remove the Air Valve Cover Assembly by disconnecting the Tank Air Hose (44) from the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank (1); and then removing the Cover Anchor Bolts (55). Tighten a 1/4" n.p.t. pipe plug into the Elbow Fitting.
2. Disconnect the two Air Valve Extension Springs (82) from the FVC Leveling Rod (83) being careful not to damage them.
3. Loosen the Hex Socket Set Screw (79) at least one-half turn with a 3/16" hex key that passes down through the top hole in the Foot Valve Control (61). Tighten a pair of curved jaw vise-grips onto the protruding end of the FVC Pivot Pin (65) and pull the Pin completely out from the Foot Valve Control. Remove the Air Valve Kicker (80) and the Foot Valve Control thereby exposing the hydraulic valves.
4. Making sure a 1/4" n.p.t. pipe plug is tightened into the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank (1), tilt the ETJ backwards until the jack's top touches the floor and the hydraulic valves point upwards. This will keep the hydraulic oil from leaking out of the valve ports and the 90 Degree Elbow Fitting.
5. Remove the Spring Compression Plate (67) by unscrewing its Retaining Bolt (66). Unscrew the Valve Stem Connector Bolts (76) and remove the Hydraulic Valve Rockers (77) by turning them upwards; and then sliding them off from the bar they pivot on.
6. Pull both the Intake Valve Stem (72) Assembly and the Exhaust Valve Stem (71) Assembly out of their respective ports. Take a pen or rod magnet and remove the 7/16" Ball Bearing (74) from each valve port.

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Hydraulic Valve Assembly

1. Keep the ETJ tilted backwards where the ETJ top touches the floor and the hydraulic valve ports point upwards...and the 1/4" pipe plug is tightened into the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank (1). This will keep the hydraulic oil from leaking out of the valve ports and from coming out of the 90 Degree Elbow Fitting.
2. Inspect the hydraulic valve ports to insure they are free from foreign matter and that the ball seats are not damaged (**never attempt to rework a damaged ball seat without first contacting the factory for proper instructions. Any unguided rework may lead to major and costly damage**). Drop a 7/16" Ball Bearing (74) into each of the ports.
3. If the Valve Stem Connectors (69) are not threaded onto Valve Stems (71)(72), thread the Finished Jam Nuts (70) and the Valve Stem Connectors about two-thirds the way onto the Valve Stems.
4. Inspect the Hydraulic Valve O-Rings (73) for wear or cuts; and replace if necessary. Oil the O-Rings liberally before sliding them over the Valve Stems (71)(72). Put a film of oil over the large diameter portion of the Valve Stems. Carefully slide each Valve Stem assembly into its respective port making sure the O-Rings do not get damaged.
5. With the Valve Stem (71)(72) assemblies pushed as far as possible into their respective ports in the Frame's valve block (1), adjust the total Valve Stem assembly length to where they protrude out 4-7/8" from a 8" square valve block, or 5-5/8" from the newer 8" round valve block.
6. Spread a little grease on each side of the Valve Rocker Bar that's welded onto the FVC Support Block (78). Push grease into each side of the pivot hole in each one of the Valve Stem Connectors (69).
7. Put the FVC Pivot Pin (65) back into the FVC Support Block (78), but don't tighten it in place.
8. Place the Valve Compression Springs (68) over the ends of the Valve Stem Connectors (69) and put the Spring Compression Plate (67) down onto the FVC Support Block (78) with the FVC Pivot Pin (65) protruding out through the Plate's oval slot. Secure the Spring Compression Plate with a 1/2" x 1" NC HH Bolt (66). Tap the top side of the Plate one way or the other with a hammer until the FVC Pivot Pin freely comes out.
9. Slide a Hydraulic Valve Rocker (77) onto each side of the Valve Rocker Bar with the small pivot hole towards the jack body. Then swing the Valve Rockers down to straddle the Valve Stem Connectors (69).
10. Connect each Valve Rocker (77) to its respective Valve Stem Connector (69) with the Special 5/16" Pivot Bolt (76) and a 5/16" NC Hex Lock Nut (75). Tighten... and then back off the Lock Nut (75) 1/2 to 3/4 of a turn **Never use a worn bolt as it can greatly affect the Valve Stem assembly's movement.**

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11. Check each one of the Valve Stem (71)(72) assemblies for proper length adjustment by placing a 3/8" or smaller rod into each one of the inspection holes in the Spring Compression Plate (67). Insert it until it hits the end of the Valve Stem Connector (69). The depth should be 1/2" (.500") plus or minus 1/32" (.031") from the end of the Valve Stem Connector to the outside surface of the Spring Compression Plate.

>>>>>>> WARNING <<<<<<<<

More than 9/16" (.562") depth from the end of the Valve Stem Connector to the outside surface of the Spring Compression Plate will dangerously lower the force being applied to the Ball Bearing (74) which could lead to the ETJ's pistons raising or lowering unexpectedly.

12. If adjustment is necessary, put a 3/4" open-end wrench onto the hex area of the Intake (72) or Exhaust (71) Valve Stem and loosen the Finished Jam Nut (70) away from the Valve Stem Connector (69). Turn the Valve Stem with the wrench to lessen or expand the depth reading mentioned in step 11 above. Each full turn will change the depth reading .042" (just a little over 1/32"). Tighten the Finished Jam Nut back up against the Valve Stem Connector.
13. Spread grease on top of the toe of each Valve Rocker (77) where it will make contact with the bottom of the Foot Valve Control (61). Apply a liberal amount of grease onto the FVC Pivot Pin (65) with a buildup on the end that will first be inserted. Lower the Foot Valve Control Assembly (60) onto the FVC Support Block (78) and insert the Pivot Pin through the front of the Foot Valve Control, through the FVC Support Block, and just out the back of the Foot Valve Control.
14. Apply some grease into the pivot hole in the Air Valve Kicker (80) and lower it down between the Tank (1) and the Foot Valve Control (61). Push the FVC Pivot Pin (65) through the Air Valve Kicker until the Pivot Pin rests against the Tank. Tighten the 3/8" Hex Socket Set Screw (79) against the Pivot Pin. **Gently** put the ETJ back upright.
15. If the Treadle Leveling Rod (83) isn't assembled onto the Air Valve Kicker (80), push the Leveling Rod through the tab. Thread a Hex Nut (81) on each side until they just touch the tab while the Leveling Rod is approximately center.
16. Hook the Air Valve Extension Springs (82) to the Spring Anchor Tabs on top of the Foot Valve Control (61) by having the hook of the Spring go through the Anchor Tabs from inside to outside. Tilt the Air Valve Kicker (80) to one side and connect that side's Spring to the FVC Leveling Rod (83); then tilt the Air Valve Kicker over to the other side **just enough** to hook the other Spring to the Leveling Rod.
17. Hold the Air Valve Kicker (80) straight up and down with one hand. With the other hand adjust the FVC Leveling Rod (83) one way or the other by turning the Hex Nuts (81), until the Foot Valve Control Assembly (61) is horizontal with the floor. Tighten both Hex Nuts against the Air Valve Kicker's tab.

18. Flip the toggle switch on the Air Valve (47) towards the center of the cover. Hold the Air Valve Kicker (80) straight up and down with one hand; and with the other hand gently put the Air Valve Cover Assembly against the Block welded on front of the Tank (1) with a gentle upward movement to allow the toggle switch on top of the Air Valve (47) to move upwards into the hole at the top of the Air Valve Kicker (80). Tighten the Air Valve Cover Assembly to the Frame Tank with the Cover Anchor Bolts (55), making sure the Air Valve toggle switch remains in the Air Valve Kicker's hole.
19. With a shop rag under the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank (1) to catch a little oil, remove the 1/4" n.p.t. pipe plug. Reconnect the Tank Air Hose (44) to the 90 Degree Elbow Fitting. Do not over-tighten as this can damage the hose end.

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Load Pistons Removal

>>>>>>> CAUTION <<<<<<<<

Two vise-grip ratcheting chain wrenches are needed to remove the Pistons (3)(12). Do not attempt to remove the Lower Piston Cap (15) without these as the Lower Piston (3) may become damaged.

1. Disconnect the shop air from the ETJ Under-the-Hoist Jack. The Tank (1) must be completely free of compressed air, and both Pistons (3)(12) must be completely lowered prior to the following operations.
2. With a pair of 90 degree snap ring pliers, remove the Snap Ring (100) that's on the Lower Rocker Pin (99) just under the structure that's welded onto the Lower Rocker Weldment (94). Pull the Lower Rocker Pin completely out while holding onto the Lower Rocker Weldment. Lift the Lower Rocker Weldment up while at the same time lifting the Shaft Tilt Insert (97) out of the Upper Piston (12).
3. Carefully wipe all dirt and grime off both Pistons (3)(12), the Lower Piston Cap (15) and the Tank Top (6).
4. Using a speed wrench with a 3/4 inch socket, first turn one of the Tank Top Retainer Bolts (10) **one** complete turn counter-clockwise. Then turn the other Bolt **two** turns. Now turn the first Bolt **two** turns...and so on until both Bolts are completely unthreaded from the Frame Tank (1). The Tank Top (6) should now have been raised to the point where the Tank Sealing O-Ring (4) is fully visible.
5. Using two people with each grabbing the Tank Top (6), slowly lift the Tank Top and Pistons (3)(12) out of the Frame Tank (1). Gently lay the assembly down on some 4x4 wood pieces, shop rags, newspaper—anything that will keep it out of the dirt and protected from damage. Do not stand the Pistons up on end.

6. Remove the Air Bleeder Plug (16). Fold a shop rag three or four times and wrap it around the Lower Piston Cap (15). Wrap the chain of one of the vise-grip ratcheting chain wrenches over the rag and tighten the wrench.
7. Wrap the chain of the second vise-grip ratcheting chain wrench over the larger 3 7/8 inch diameter section at the bottom of the Lower Piston (3). Now loosen the Lower Piston Cap (15) from the Lower Piston. It may require a sharp rap with a mallet against the wrench to break the Cap loose.

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Load Pistons Installation

>>>>>>> CAUTION <<<<<<<<

Two vise-grip ratcheting chain wrenches are needed to install the Pistons (3)(12). Do not attempt installation without them as damage to the Lower Piston Cap (15) and Pistons may occur.

1. Any of the O-Rings that are being installed onto the Tank Top (6) and the Lower Piston Cap (15) should have a film of grease on them prior to installation. Great care should be taken to insure the Piston-Cap O-Ring (13) doesn't become damaged by the threads. Both Pistons (3)(12), Lower Piston Cap and the Tank Top assembly must be free of any foreign matter.
2. Do not attempt to install the Load Pistons without using the specially manufactured Tank Top Retainer Bolts (10) that use the Bolt Retainer Spring Pins (11). Without them, future removal of the Tank Top would be very difficult. Make sure these Bolt assemblies are onto the Tank Top at this time.
3. Spread a film of grease on the complete inside bore of the Lower Piston Cap (15); and on the complete inside bores of the Tank Top (6), plus the outside portion that will go into the Frame Tank (1).
4. Install the Piston Retainer Ring (2) into the Lower Piston (3), if necessary. Gently slide the Tank Top (6) over the top of the Lower Piston. Gently lower the Upper Piston (12) down into the Lower Piston. Thread the Lower Piston Cap (15) down into the Lower Piston by hand.
5. Wrap the chain of a vise-grip ratcheting chain wrench over the larger 3 7/8 inch diameter section at the bottom of the Lower Piston (3) and tighten. Fold a shop rag three or four times and wrap it around the Lower Piston Cap (15). Wrap the chain of the second vise-grip ratcheting chain wrenches **over** the rag and tighten. Now tighten the Lower Piston Cap firmly against the Lower Piston (3). Remove both wrenches.
6. Using two people with each grabbing the Tank Top (6), slowly lower the assembly down into the Frame Tank (1). If this operation is done too fast, oil may cascade out of the Frame Tank. Tighten the Air Bleeder Plug (16) into the Lower Piston Cap (15).

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7. Using a speed wrench with a 3/4 inch socket, first turn one of the Tank Top Retainer Bolts (10) one complete turn clockwise. Then turn the other Bolt **two** turns. Now turn the first Bolt two turns... and so on until the Tank Top (6) is firmly secured to the top of the Frame Tank (1).
8. Step down all the way on the right (intake) side of the Foot Valve Control (61) and raise both Pistons (3)(12) slowly to their fully extended position. Step down all the way on the left side of the Foot Valve Control until one of the Pistons lowers about one inch. Slowly unscrew the Air Bleeder Plug (16) at the top of the Lower Piston (3) just enough to allow the trapped air to escape. When a steady stream of oil flows out, re-tighten the Air Bleeder Plug.
9. Go to the following **Lifting Head Assembly** section and complete any steps necessary.

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Lifting Head Assembly

1. Press the Foot Valve Control (61) down on the right (intake) side until the top of the Upper Piston (12) is about chest high.
2. Spread a film of grease on the Lower Rocker Pin (99) and put the Snap Ring (100) on one end only. Put the Shaft Tilt Insert (97) into the top of the Upper Piston (12). Put some hydraulic oil on the threaded rod that's anchored to the Lower Rocker Weldment (94) and thread the rod into the receiving threaded hex bar of the Shaft Tilt Insert until the threaded rod sticks out below the threaded hex bar about 1 inch.
3. Lower the Lower Rocker Weldment (94) over the Shaft Tilt Insert (97) and the Upper Piston (12). Pass the Lower Rocker Pin (99) through the one ear of the Lower Rocker Weldment that doesn't have the structure welded to it; and then through the Upper Piston, the Shaft Tilt Insert, and out the other ear of the Lower Rocker Weldment. With a pair of 90 degree snap ring pliers, install the second Snap Ring (100) onto the Lower Rocker Pin.
4. If necessary, put some hydraulic oil on the threaded rod that's anchored to the Upper Lifting Head (93) and thread the rod into the receiving threaded hex bar of the Lower Rocker Weldment (94) until the threaded rod sticks out below the threaded hex bar about 1 inch.
5. Install a Snap Ring (92) onto the Upper Tilt Pivot Pin (91) in the groove next to the buckle. Spread a film of grease over the section of the Pin between the snap ring grooves. Lower the Upper Lifting Head (93) over the Lower Rocker Weldment (94). Pass the Pin through the Upper Lifting Head and the Lower Rocker Weldment so that the chamfered hole end of the Pin is over the threaded rod that's anchored to the Lower Rocker Weldment. Install the second Snap Ring (92) onto the Pin.
6. If necessary, thread a Jam Nut (95) onto the threaded rod that's anchored to the Lower Rocker Weldment (94); and onto the one anchored to the Upper Lifting Head (93). Thread the Tilt Crank Knob (96) 5/8 to 3/4 inch onto each threaded rod. Tighten the Jam Nuts against the Knobs with sufficient force to "lock" them in place.

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Air Valve Cover Assembly Notes

1. To remove the Air Valve Cover Assembly, first disconnect the Tank Air Hose (44) from the 90 Degree Elbow Fitting (36/46) at the top of the Frame Tank (1). Then unscrew the two Cover Anchor Bolts (55). Allow the Air Valve Cover (40) to drop slightly so the Air Valve's (47) toggle switch will "drop" out of the Air Valve Kicker (80).
2. To assemble the complete Air Valve Cover Assembly, start by tightening the Safety Pop-off Valve (50) into the Pipe Female Tee (51). Now tighten the Air Muffler (48) and the Air Hose (57) into the Air Valve (47). Then tighten the Pipe Nipple (49) and the Pipe Female Tee to the Air Valve. Take the Air Valve sub assembly and loosely tighten the Air Valve to the anchor welded inside the Air Valve Cover (40). Now put the 1/8" 90 Degree Elbow (54) through the hole in the Air Valve Cover and tighten it into the Pipe Female Tee (51). Finish by tightening the Air Valve nuts....but do not over-torque!
3. No longer necessary
4. To re-assemble the Air Valve Cover Assembly back onto the ETJ, flip the Air Valve's (47) toggle switch towards the center of the Cover. Hold the Air Valve Kicker (80) straight up with one hand; and with the other hand gently put the Cover Assembly against the Block welded on front of the Tank (1) with a gentle upward movement to allow the Toggle to move upwards into the hole at the top of the Air Valve Kicker (80). The Air Valve Cover's (40) holes should now line up with the Block's threaded holes.

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ETJ & ETJ-EH PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	QTY.
ETJ Under-the-Hoist Jack			
1	ETJA-F	FRAME TANK	1
2	6738	3.125" INTERNAL RING	1
3	9570	ETJA-RSL LOWER PISTON	1
4	5239	DASH 261 6.75" x 7." O-RING	1
5	5238	DASH 245 4.375" x 4.625" O-RING	1
6	9525	ETJA-83 TANK TOP	1
7	5254	DASH 342 3.625" x 4." O-RING	1
8	5224	DASH 206 .5" x .75" O-RING	2
9	6626	1/2" SAE FLAT WASHER	2
10	ETJA-89	TANK TOP RETAINING BOLT	2
11	6948	1/8" x 1." SPRING PIN	2
12	9575	ETJA-RSU UPPER PISTON	1
13	5236	DASH 235 3.125" x 3.375" O-RING	1
14	8046	ETJ AIR BLEEDER PLUG WARN LABEL	1
15	9502	ETJA-58 LOWER PISTON CAP	1
16	5748	1/8" N.P.T. HEX HEADED PIPE PLUG	1
17	5244	DASH 336 2.875" x 3.25" O-RING	1
18	6700	3100-50 1/2" SNAP RING	3
19	ETJA-110	TRANSPORT HANDLE PIN	1
20	ETJA-H	TRANSPORT HANDLE	1
21	7880	HANDLE GRIP	2
22	6252	3/8" x 1" NC HH BOLT	16
23	6025	3/8"-16 NC HEX NUT	18
24	7249	21-4 MC PC 4" SWIVEL CASTER	4
25	7895	#2 3/16" SH "U" DRIVE SCREW	2
26	7890	BRASS OVAL I.D. TAG	1
27	8048	ETJ WARNING/INSTRUCTION STICKER	1
28	5751	1/4" N.P.T. HEX HEADED PIPE PLUG	1
29	8050	OIL LEVEL STICKER	1
30	8044	AIR BLEEDING INSTRUCTION LABEL	1
31	8010	M.H.C. CORPORATE 5" DECAL	1
32	8045	MAXIMUM AIR PRESSURE LABEL	1
33	8043	AIR CAPACITY CHART LABEL	1
34	8047	AIR VALVE OILING ALERT LABEL	1
35	-	NO LONGER USED	
36	5641	1/4" NPT 90 DEGREE STREET ELBOW	1
37	_____		
38	_____		
39	_____		
40	ETJA-J	AIR VALVE COVER (only)	1

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ITEM NO.	PART NO.	DESCRIPTION	QTY.
41	8940	3/8" NEOPRENE RUBBER 3/4" x 1 1/2"	1
42	8040	M.H.C. PRODUCT SERVICE LABEL	1
43	8049	ETJ SAFETY VALVE WARNING	1
44	5553	ETJ 2000 SERIES 10" AIR HOSE	1
45	5645	1/4" N.P.T. F/F ELBOW	1
46	(same as #36)		
47	5791	CLIPPARD MUTV-3 AIR VALVE	1
48	5795	SMALL 1/8" N.P.T. AIR MUFFLER	1
49	5692	1/8" N.P.T. x 1 1/2" PIPE NIPPLE	1
50	5785	160 psi SAFETY POP-OFF VALVE	1
51	5662	1/8" N.P.T. PIPE FEMALE TEE	1
52	ETJ-REG02	AIR REGULATOR w/GAUGE ASSY.	1
53	9002	1/4" AIR GAUGE (250psi)	1
54	5642	1/8" N.P.T. 90 DEGREE STREET ELBOW	1
55	6240	5/16" x 3/4" NC HH BOLT	2
56	8005	M.H.C. CORPORATE 2 1/2" DECAL	1
57	5554	ETJ 2000 SERIES 13" AIR HOSE	1
58	—		
59	—		
60	ETJA-GA	FOOT VALVE CONTROL ASSEMBLY	1
61	ETJA-G	FOOT VALVE CONTROL (only)	1
62	7420	F4 COMPRESSION SPRING	1
63	9504	ETJA-67 RELEASE LOCKING PIN	1
64	(same as #18)		
65	ETJA-69	FVC PIVOT PIN	1
66	6300	1/2" x 1" NC HH BOLT	1
67	ETJA-63	SPRING COMPRESSION PLATE	1
68	7431	VALVE COMPRESSION SPRING	2
69	9510	ETJA-70 VALVE STEM CONNECTOR	2
70	6027	3/8"-24 NF HEX FINISH JAM NUT	2
71	9520	ETJA-72 EXHAUST VALVE STEM	1
72	9515	ETJA-71 INTAKE VALVE STEM	1
73	5222	DASH 204 3/8" x 5/8" O'RING	2
74	5918	7/16" GR25 BALL BEARING	2
75	6020	5/16" NC HEX LOCK NUT	2
76	6225	SPECIAL 5/16" PIVOT BOLT	2
77	ETJA-I	HYDRAULIC VALVE ROCKER	2
78	—	FVC SUPPORT BLOCK (part of #1)	
79	6015	3/8-16 x 3/8" HEX SOC SET SCREW	1
80	ETJA-K	AIR VALVE KICKER	1
81	(same as #23)		
82	7443	AIR VALVE EXTENSION SPRING	2
83	ETJA-96	FVC LEVELING THREADED ROD	1
84	—		
85	—		

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ITEM NO.	PART NO.	DESCRIPTION	QTY.
86	_____		
87	_____		
88	_____		
89	_____		
90	9210	TRANSMISSION TIE-DOWN STRAP	1
91	ETJA-U	UPPER TILT PIVOT PIN	1
92	6710	3100-75 3/4" SNAP RING	4
93	ETJA-Q	UPPER TILTING HEAD ASSY.	1
94	ETJA-N	LOWER ROCKER ASSEMBLY	1
95	6055	5/8"-18 NF FINISH JAM NUT	2
96	9300	BLACK FLUTED PLASTIC KNOB	2
97	ETJA-M	SHAFT TILT INSERT	1
98	7580	1/4"-28 x 1/2" GREASE FITTING	2
99	ETJA-99	LOWER ROCKER PIN	1
100	(same as #92)		
101	_____		
102	_____		
103	_____		
104	_____		
105	_____		
106	_____		
107	_____		
108	_____		
109	_____		
110	6302	1/2" x 1 1/4" NC HH BOLT	8
111	6625	1/2" USS FLAT WASHER	12
112	ETJA-107	TRANSMISSION SUPPORT ARM	4
113	6336	1/2" x 4 1/2" NC HH ALL THRD. BOLT	4
114	6035	1/2" NC HH NUT	8
115	ETJA-X	TRANSMISSION PAN SUPPORT	4
116	6310	1/2" x 2" NC HH BOLT ZP	4

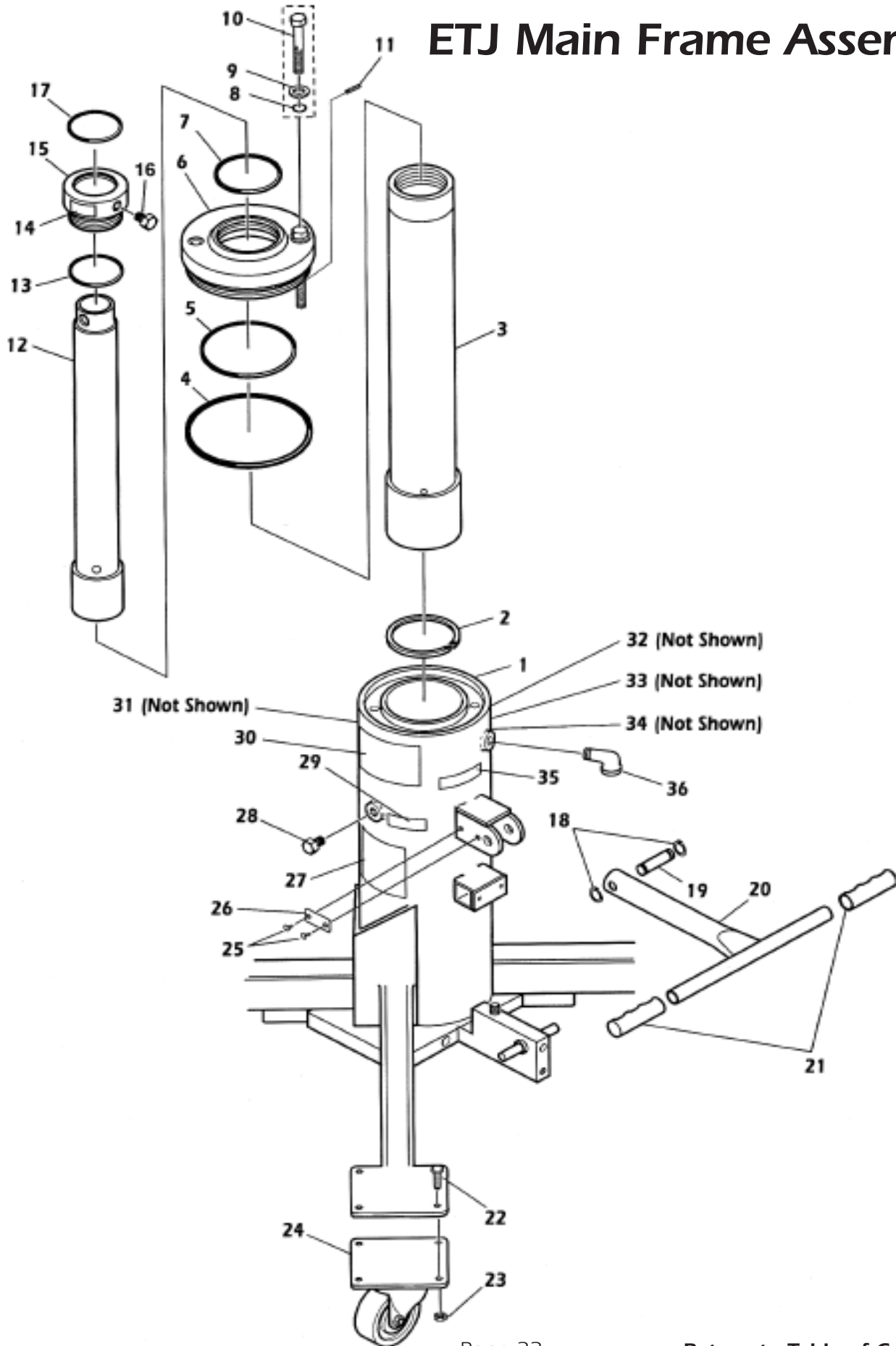
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ETJ-EH Engine Support Head

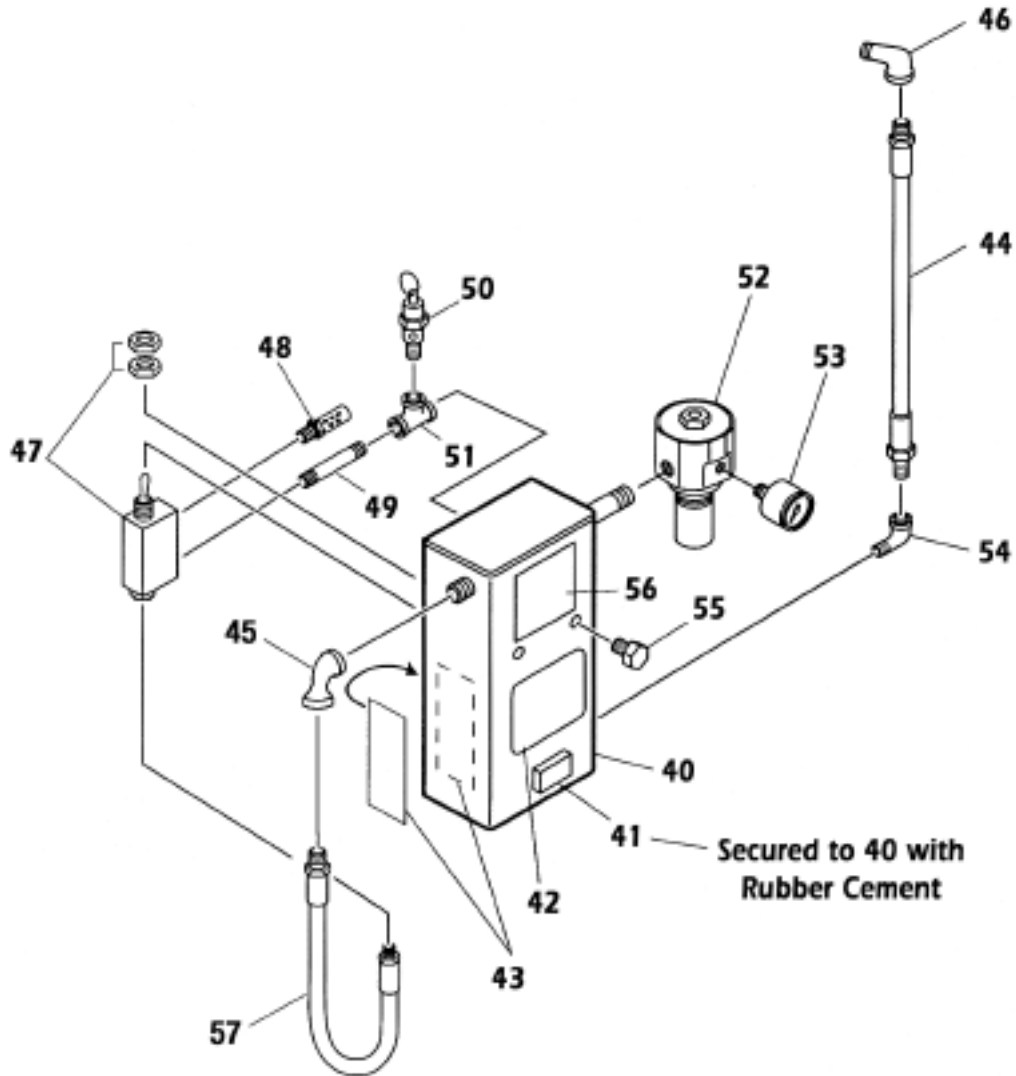
120	ETJM-25	PROTECTION RUBBER PAD	1
121	6247	5/16" x 4 1/2" NC CARRIAGE BOLT	4
122	ETJM-28	4x4 WOODEN MOTOR SUPPORT	2
123	6609	5/16" S.A.E. FLAT WASHER	4
124	6021	5/16" NC FORGED WING NUT ZP	4
125	ETJM-A	LEFT MOTOR BASE SLIDE	2
126	6300	1/2" x 1" NC HH BOLT	4
127	ETJM-B	RIGHT MOTOR BASE SLIDE	2
128	ETJM-C	MOTOR SUPPORT HEAD FRAME	1
129	8017	ETJ-EH WARNING STICKER	2
130	9200	RATCHET SAFETY TIE-DOWN STRAP	1

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ETJ Main Frame Assembly

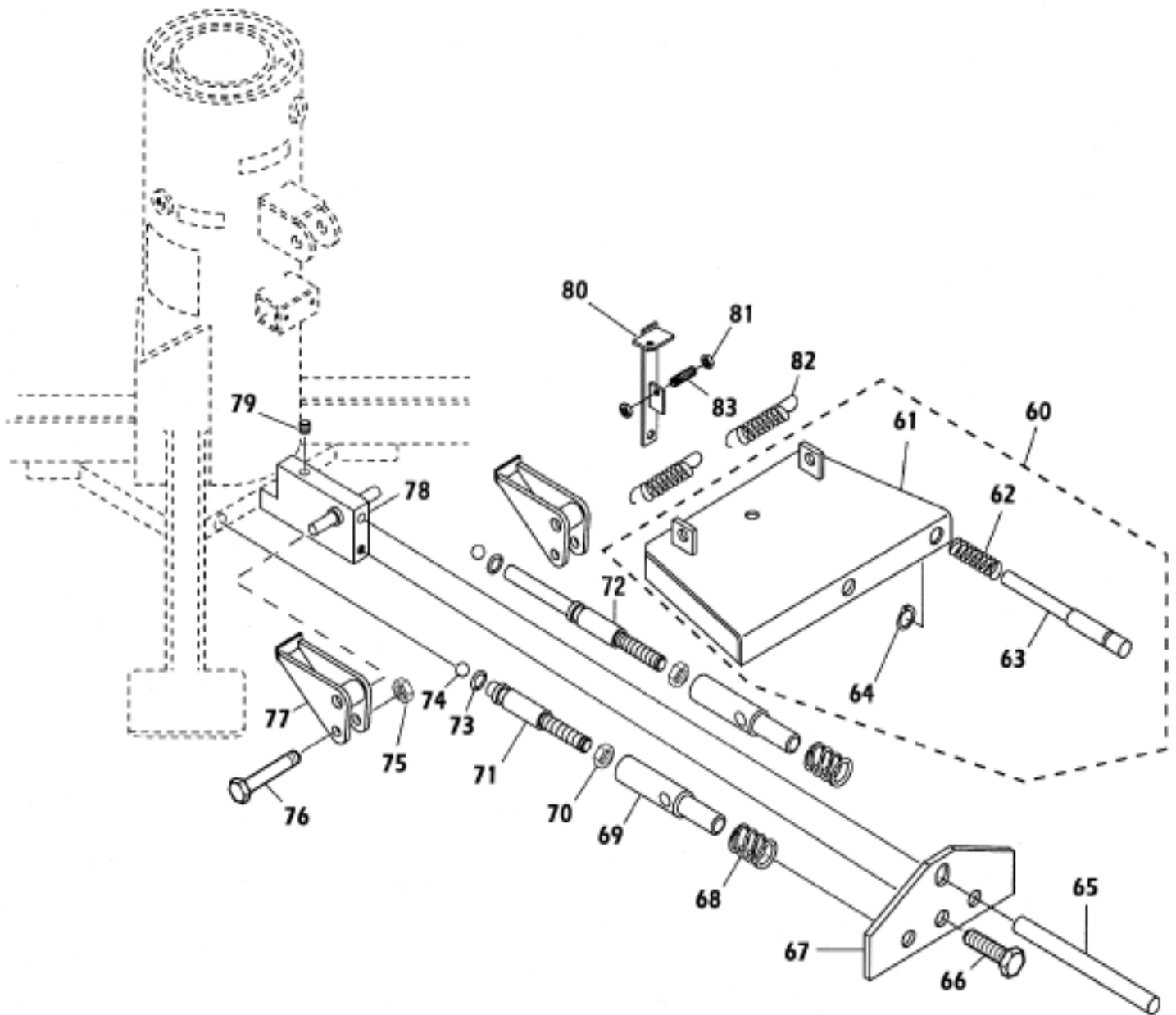


ETJ Air Valve Cover Assembly



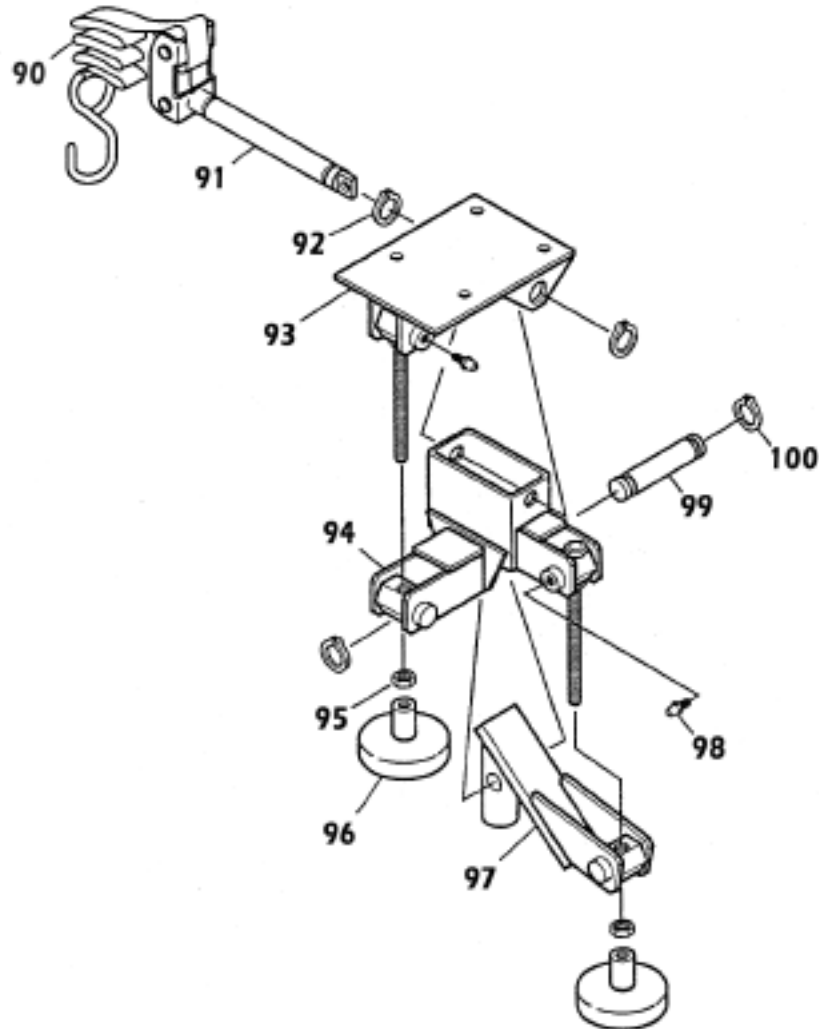
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ETJ Foot Valve Control Assembly

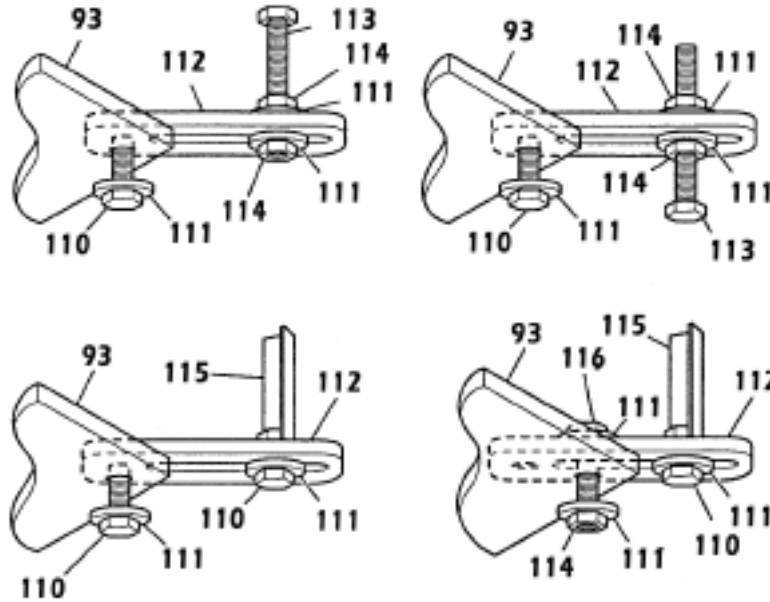


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ETJ Lifting Head Assembly

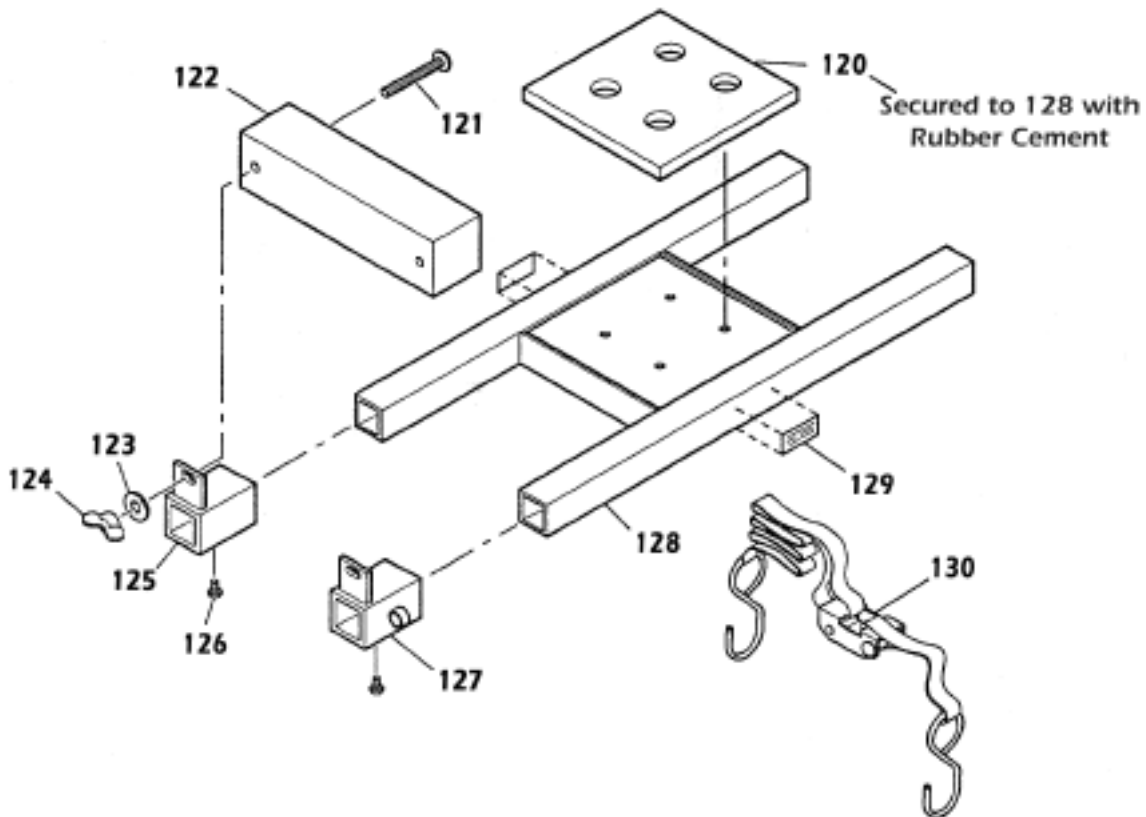


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Support Arm Assembly Configurations

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ETJ-EH Engine Support Head Assembly

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