Meyer Hydraulics Corp.

ETJ OPERATING & SERVICING INSTRUCTIONS

Serial No. 1000 Series

Do not use the ETJ until the operator has read, and fully understands the instructions in the "INITIAL SET-UP" and "OPERATING" sections of this Manual.

September, 1992

PHONE (616) 467-6302

MEYER® HYDRAULICS "Built to Last"

Manufacturer of:
JACKS
CRANES
PRESSES
HANDLING EQUIPMENT

MEYER HYDRAULICS CORPORATION
512-22 W. BURR OAK ST.
CENTREVILLE, MICHIGAN 49032

Dear ETJ Owner:

Welcome to the growing family of ETJ owners who have had the insight to go beyond today's "norm" in under-the-hoist lifting equipment and purchase what we consider to be the "ultimate".

Your new ETJ has undergone the most rigorous testing given to any product we manufacture. Our people have done everything possible to help make your "get acquainted time" to be one of eye-opening amazement, inquisitive investigation, and concluding agreement: "Yes, indeed, there's no better way!"

I encourage you to give us a call in a month or two and let us know how the ETJ has fit into your operations. Your comments, both positive and negative, will go a long way in helping us to reach the goal where the ETJ has become the "norm".

Barry J. Meyer

Barry Meyer, President

P.S. Please read the Initial Set-up & Operating Instructions before putting your ETJ into service.

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ETJ INITIAL SET-UP INSTRUCTIONS

1. Thread your own male air connector into the Air Regulator (25) with moderate force making sure the Air Regulator's Gauge (24) remains slightly tilted upwards so the operator can view it without bending over. If your ETJ already has the legs in place, go to the following "Operating The ETJ" section.

3. If your ETJ doesn't have the legs in place, then set the Frame (100) onto a block of wood or something that's at least 3/4" thick.

4. Push the Leg Retaining Bolt (103) through the Leg Retension Washer (104), and then through the side of the Removable Leg (105 or 102) until it just comes out the other side of the Leg.

5. Slide the Leg into the Frame's (100) Leg Receiver area as shown in the "ETJ Removable Leg Assemblies" drawing. Tighten the Bolt (103) into the threaded hole of the vertical Leg Receiver Plate until its head just comes up against the Retension Washer (104).

6. When all Legs are assembled to the Frame (100), pull out the block from under the Frame. Making sure all Legs are resting on the top horizontal cover plate, tighten each Bolt (103) with moderate torque.

OPERATING THE ETJ

Lifting & Lowering Instructions

1. Connect your shop compressed air supply to the ETJ's Air Regulator (25). If necessary, pull down on the black adjustment knob at the bottom of the Air Regulator and turn until the Air Gauge (24) registers 35-50 psi for working with transmissions, transaxles (only), power dividers, etc.;....or 130-145 psi for working with engines/transaxles and other heavy loads up to 1700 pounds weight for the first 19" raise and 1000 pounds thereafter. Push the black adjustment knob upwards to "lock in" your pressure setting. Never use more than 150 psi air pressure in your ETJ!

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

It is always best to set the maximum air pressure 10-15% greater than that which is required to lift the load, but no higher! In doing so, shop air is being used effeciently, and the time necessary for the ETJ's Tank (28) to depressurize enough to lower a load will be kept to an absolute minimum.

2. For **coarse adjustment** of the ETJ height, step hard on the right (intake) side of the Foot Valve Control (68) for lifting, or on the left (exhaust) side for lowering. This activates both the Air Valve (37) and the Hydraulic Valve (64 or 57) at the same time. Within 0-3 seconds the Pistons (3)(6) will begin their travel smoothly, but briskly. All movement will immediately stop the instant the pressure is taken off the Foot Valve Control.

3. For **fine adjustment** of the ETJ height, step lightly on the right (intake) side of the Foot Valve Control (68) 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 (52)). This activates the Air Valve (37) to pressurize or depressurize the ETJ's Tank (28). Wait 3 seconds; and then begin to increase your foot pressure slightly until the Load Piston (3 or 6) 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 Hydaulic Valve (57 or 64) is actuated.

4. The Release Locking Pin (66) 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 (68) and push in the Pin until it can rest on top of the tab welded onto the side of the Tank (28). 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.

5. When you take your foot off the Foot Valve Control (68), 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 (73) to "kick" the Air Valve (37) from an air intake mode to an air exhaust mode....or vice versa.

Support Arms Use Instructions

1. If necessary, remove the ETJ-EH Engine Support Head (128) from the Upper Lifting Head (85); and turn the Safety Tie-down Buckle (80) until it points upwards, thereby allowing the Safety Strap (80) 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 (85) 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).**

Engine Support Head Use Instructions

1. If necessary, remove the Transmission Support Arms (112) from the Upper Lifting Head (85); and turn the Safety Tie-down Buckle (80) until it points straight down. Hook the "J" Hook of the Safety Tie-down Strap (80) into the milled portion of the Upper Tilt Pivot Pin (83) from beneath; and wrap the excess Strap around the Lower Rocker Weldment (86) to keep it out of the way.

2. Set the ETJ-EH Engine Support Head (128) over the Upper Lifting Head (85) 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.

MAINTAINING THE ETJ

Monthly Maintenance Schedule

1. Oil both sides of the Upper Tilt Pivot Pin (83) where it comes out of the Upper Lifting Head (85). 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 (86).

2. Oil the Lower Rocker Rollers (92) where they are up against the Lower Rocker Weldment (86). Oil the Lower Rocker Pin/Axle (91) in between the Upper Piston (3) and the Lower Rocker Weldment.

3. Inspect both threaded rods that are anchored to the Upper Lifting Head (85) and the Lower Rocker Weldment (86) 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 (90).

4. Have both Pistons (3)(6) fully raised. Spread a film of oil over the "bare" portion on each Piston. Put a rapid "squirt" of oil into each of the two air venting holes on the sides of the Secondary Cylinder Cap (2) while a finger closes the other hole. Immediately lower the Upper Piston (3) only. Squirt oil into the holes of the Main Cylinder Cap (8) as was done above and immediately lower the Piston-Cylinder (6). Wait about one minute, and then raise both pistons to their maximum height. Wipe off any excess oil.

5. Oil the Transport Handle (18) where it pivots on the Transport Handle Pin (19). Put a single "squirt" of clean oil into the male air hose connector that was screwed into the Air Regulator (25). Squirt a little oil on the center vertical bar of the Air Valve Kicker (73) so the oil will run down onto the Treadle Pivot Pin (63) below.

6. Make sure the Air Valve Cover Bolt (40) and the Spring Compression Plate Bolt (62) haven't become loose. Do not over-torque!

7. Press the Foot Valve Control (68) completely down on the right (intake) side; and while it's all the way down, squirt a little oil on top of the Intake Valve Stem (64) where it goes into the Valve Base of the jack's Frame (28). Press down on the left (exhaust) side in the same way and oil the Exhaust Valve Stem (57).

8. Press the Foot Valve Control (68) completely down on the right (intake) side; and while it's all the way down, spread grease on top of the toe of the Exhaust Valve Rocker (52) (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 by hand the Jam Nut (58) that's threaded onto the Exhaust Valve Stem (57). If it turns, you'll need to go through the Valve Stem adjustment steps 1, 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.

Bi-Annual Maintenance Schedule

1. Grease the axle and oil the upper ball bearing race on each one of the Swivel Casters (106). Some may find their ETJ rolls and casters better if they grease and oil the Swivel Casters more often.

2. Lower both Pistons (3)(6) completely. Lower the Frame Tank (28) air pressure to zero. Unscrew the Oil Filler Pipe Plug (11) 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 1.9 gallons. Never overfill! If too much oil is put into the Tank, oil will be exhausted with the air. Replace the Oil Filler Plug.

3. Check the Bolt (82) that retains the Tie-down Strap Buckle for wear or damage. If any significant amount is evident, replace the bolt.

Hydraulic Oil Change Schedule

1. The hydraulic oil should be competely changed every five years. The ETJ uses just under two gallons of either Hydraulic Jack Oil, Automatic Transmission Oil, or MIL-H-5606 Hydraulic Fluid.

2. Have both Pistons (3)(6) fully lowered and reduce the Frame Tank (28) air pressure to zero. Tilt the ETJ towards the side that has the Oil Filler Pipe Plug (11) until the Frame Tank is horizontal.

3. Disconnect the Tank Air Hose (22) from the 45 Degree Swivel Fitting (23). Place a two gallon capturing pan below the Oil Filler Pipe Plug (11). Remove the Plug and drain the oil.

4. Put the ETJ back upright and temporarily tighten the Pipe Plug (11) into the 45 Degree Swivel Fitting (23). Do not over-tighten.

5. Tilt the ETJ toward the side that has the Air Regulator (25) on until the Frame Tank (28) is horizontal. Using a small funnel, pour in 1 3/4 gallons of oil mentioned in step 1 above.

6. Gently put the ETJ back upright and continue to fill the Frame Tank (28) 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.

7. With a shop rag under the 45 Degree Swivel Fitting (23) to catch a little oil, remove the Oil Filler Plug (11) and re-tighten it back into the filler hole on the side of the Frame Tank (28). Reconnect the Tank Air Hose (22) to the 45 Degree Swivel Fitting. Do not over-tighten as this can damage the hose end.

SERVICING THE ETJ
Symptoms & Cures

The Upper Piston has become "jerky" or "jumpy"!

- **WARNING! Do not operate the ETJ in this condition!**

- The oil level in the ETJ's Tank (28) has become so low that air now enters the cylinder before the pistons reach full extension. Immediately lower both Pistons (3)(6) completely. Reduce the Frame Tank (28) air pressure to zero. Unscrew the Oil Filler Pipe Plug (11) 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 1.9 gallons).

The ETJ will not raise a heavy load!

- Are you sure the load is less than 1000 pounds? Are you sure the load isn't severely off-set from center?

- Is the shop compressed air able to deliver 140 psi? Is the Air Regulator (25) properly adjusted? Is the Air Gauge (24) working?

- Leaving the Air Regulator (25) connected to the Male Coupling Nipple (26), unscrew the Nipple from the Air Receiving Block welded onto the Frame Tank (28). Connect a male hose connector directly to the Air Receiving Block (1/4" NPT); and the shop air to it. This should prove that the Air Regulator is no longer working properly.

- Make sure the Spring Compression Plate Bolt (62) hasn't become loose. Do not over-torque!

The ETJ's Pistons go up way too slowly!

- Check the shop air hose for restrictions.

- Check the Air Regulator (25) by following the 3rd procedure of the previous symptom.

- Remove your male hose connector; and then remove the Air Receiving Screen (27) with a small pair of bill-nosed pliers. Blow out the Screen with shop air, clean it, and insert it all the way back into the Air Receiving Block with the seams upwards.

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

- **WARNING! Do not operate the ETJ in this condition!**

- Make sure the Spring Compression Plate Bolt (62) hasn't become loose. Do not over-torque!

- Check for proper Valve Stem adjustment as shown in the step 11 procedure found in the "Hydraulic Valve Assembly" section.

- There might be something between the Ball Bearing (55) and its seat in one of the ports in the Valve Base of the Frame (28). See the "Hydraulic Valve Removal and Assembly" sections.

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

- **WARNING! Do not operate the ETJ in this condition!**

- There is something between the Ball Bearing (55) and its seat in one of the ports in the Frame's Valve Base (28). See the "Hydraulic Valve Removal and Assembly" sections.

Air Valve Cover Assembly

>>>>>>>> **WARNING** <<<<<<<<

The ETJA-JA Air Valve Cover Assembly should never be installed onto the ETJ Jack if the Safety Valve Warning Label (46) is missing from the inside of the Air Valve Cover. It warns that the ETJ Jack should never be used without the 160 psi Pop-off Safety Valve.

1. Being careful not to crush or damage the Air Valve (37) in a vise, etc. while assembling items to it, tighten the two 1/4" Pipe Plugs (36) into the Air Valve (37) at the C1 cylinder and exhaust ports.

2. Tighten the 160 psi Pop-off Safety Valve (30) and the Tank Air Hose (38) into the Female Tee (31). Put some pipe compound or Teflon tape on the 1/4" Pipe Nipple (32) where it will thread into the Female Tee and thread it in by hand.

3. Tighten the above assembly into the C2 cylinder port of the Air Valve (37). Make sure the Tank Air Hose ends up in line with the Air Valve and over the C1 cylinder port pipe plug.

4. Tighten the Street Elbow (34) into the intake port of the Air Valve (37) to where it points 12-15 degrees out-of-line with the Air Valve towards the jack side and away from the Valve Cover (44). Tighten the Incoming Air Hose (35) into the Street Elbow. Thread the Air Muffler (33) into the C2 exhaust port.

5. Place the Air Valve Cover (44) upside down and push the Tank Air Hose (38) through the oval hose passage slot in the top of the Air Valve Cover. Then push the Incoming Air Hose (35) through the hose passage slot on top of the Tank Air Hose. You may experience some difficultly pushing the hose end through the slot, but if a slight downward pressure is applied it will go through.

6. Push two Bolts (45) up through the Air Valve Cover (44). Put two Flat Washers (39) over each Bolt. Bring the Air Valve (37) over the Bolts and thread them into the Air Valve. Make sure the Air Valve isn't tilted as you tighten the bolts.

Foot Valve Control Assembly

1. Turn the Foot Valve Control (68) upside down.

2. Push the Compression Spring (67) over the small end of the Release Locking Pin (66) 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 (68) until the small portion of the Release Locking Pin (66) protrudes through the backside of the Foot Valve Control as far as possible. At this point the Compression Spring (67) should be fully compressed inside of the Compression Spring Housing (not shown) that's welded to the underside of the Foot Valve Control; and the large portion of the Release Locking Pin should be clear of the front lip of the Foot Valve Control.

4. Slide the .5" Snap Ring (65) over the large portion of the Release Locking Pin (66) 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 to where the large portion end of the Pin is flush with the outside front lip of the Foot Valve Control.

Hydraulic Valve Removal

1. Remove the Air Valve Cover Assembly by disconnecting the Tank Air Hose (22) from the 45 Degree Swivel Fitting (23); then disconnecting the Incoming Air Hose (20) from the Straight Swivel Fitting (21); and then removing the Cover Anchor Bolt (40) and its Flat Washer (41).

2. Disconnect the two Air Valve Extension Springs (70) from the Treadle Leveling Rod (71) being careful not to damage them.

3. Loosen the Hex Socket Set Screw (50) at least one-half turn with a 3/16" hex key that passes down through the top hole in the Foot Valve Control (68).

4. Tighten a pair of curved jaw vise-grips onto the protruding end of the Treadle Pivot Pin (63) and pull the Pin completely out from the Foot Valve Control (68). Remove the Air Valve Kicker (73) and the Foot Valve Control thereby exposing the hydraulic valves.

5. Tilt the ETJ backwards until the jack's tank is horizontal and the hydraulic valves point straight upwards. This will keep the hydraulic oil from leaking out when the valves are removed and from coming out of the air inlet at the top of the jack's tank.

6. Remove the Spring Compression Plate (61) by unscrewing its Retaining Bolt (62). Unscrew the Valve Stem Connector Bolts (53) and remove the Hydraulic Valve Rockers (52) by turning them upwards; and then sliding them off from the bar they pivot on.

7. Pull both the Intake Valve Stem (64) Assembly and the Exhaust Valve Stem (57) Assembly out of their respective ports. Take a pen or rod magnet and remove the 7/16" Ball Bearing (55) from each valve port.

Hydraulic Valve Assembly

1. Keep the ETJ tilted backwards where the jack's tank is horizontal and the hydraulic valve ports point straight upwards. This will keep the hydraulic oil from leaking out of the valve ports and from coming out of the air inlet at the top of the jack's tank.

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 (55) into each of the ports.

3. If the Valve Stem Connectors (59) are not threaded onto Valve Stems (57)(64), thread the Finished Jam Nuts (58) and the Valve Stem Connectors about two-thirds the way onto the Valve Stems.

4. Inspect the Hydraulic Valve O-Rings (56) for wear or cuts; and replace if necessary. Oil the O-Rings liberally before sliding them over the Valve Stems (57)(64). 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 (57)(64) assemblies pushed as far as possible into their respective ports, adjust the total Valve Stem assembly length that protrudes out from the Frame's (28) valve block 4 27/32".

6. Spread a little grease on each side of the Valve Rocker Bar that's welded onto the Treadle Support Block (51). Push grease into each side of the pivot hole in each one of the Valve Stem Connectors (59).

7. Put the Treadle Pivot Pin (63) back into the Treadle Support Block (51), but don't tighten it in place.

8. Place the Valve Compression Springs (60) over the ends of the Valve Stem Connectors (59) and put the Spring Compression Plate (61) down onto the Treadle Support Block (51) with the Treadle Pivot Pin (63) protruding out through the Plate's oval slot. Secure the Spring Compression Plate with a 1/2" x 1" NC HH Bolt (62). Tap the top side of the Plate one way or the other with a hammer until the Treadle Pivot Pin freely comes out.

9. Slide a Hydraulic Valve Rocker (52) 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 (59).

10. Connect each Valve Rocker (52) to its respective Valve Stem Connector (59) with the Special 5/16" Pivot Bolt (53) and a 5/16" NC Hex Lock Nut (54). Never use a worn bolt as it can greatly affect the Valve Stem assembly's movement.

11. Check each one of the Valve Stem 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 (61). Insert it in until it hits the end of the Valve Stem Connector (59). The depth should be **17/32"** (.531") 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 (55) which could lead to the ETJ's pistons raising or lowing unexpectedly.

12. If adjustment is necessary, clamp a pair of curved jaw vise grips onto the non-thread area of the Intake (64) or Exhaust (57) Valve Stem and loosen the Finished Jam Nut (58) away from the Valve Stem Connector (59). Turn the Valve Stem with the vise grips 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 (52) where it will make contact with the bottom of the Foot Valve Control (68). Apply a liberal amount of grease onto the Treadle Pivot Pin (63) with a buildup on the end that will first be inserted. Lower the Foot Valve Control Assembly (69) onto the Treadle Support Block (51) and insert the Pivot Pin through the front of the Foot Valve Control, through the Treadle Support Block (51), and just out the back of the Foot Valve Control.

14. Apply some grease into the pivot hole in the Air Valve Kicker (73) and lower it down between the Tank (28) and the Foot Valve Control (68). Push the Treadle Pivot Pin (63) through the Air Valve Kicker until the Pivot Pin rests against the Tank. Tighten the 3/8" Hex Socket Set Screw (50) against the Pivot Pin. Gently put the ETJ back upright.

15. If the Treadle Leveling Rod (71) isn't assembled onto the Air Valve Kicker (73), push the Leveling Rod through the tab. Thread a Hex Nut (72) on each side until they just touch the tab while the Leveling Rod is approximately center.

16. Hook the Air Valve Extension Springs (70) to the Spring Anchor Tabs on top of the Foot Valve Control (68) by having the hook of the Spring go through the Anchor Tabs from inside to outside. Tilt the Air Valve Kicker (73) to one side and connect that side's Spring to the Treadle Leveling Rod (71); 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 (73) straight in line with the Tank (28) with one hand. With the other hand adjust the Treadle Leveling Rod one way or the other until the Foot Valve Control Assembly (69) is horizontal with the floor. Tighten both Hex Nuts (72) against the Air Valve Kicker's tab.

18. Gently put the Air Valve Cover Assembly onto the Anchor Channel welded on the front of the Tank (28). Put the Cover Anchor Bolt (40) down through the Flat Washer (41) and thread part way down into the Anchor Channel. Push the Air Valve Cover's top flat against the Tank and hold while tightening the Cover Anchor Bolt.

19. Connect the Incoming Air Hose (20) to the Straight Swivel Fitting (21); and connect the Tank Air Hose (22) to the 45 Degree Swivel Fitting (23). Do not over-tighten as this can damage the hose ends.

Load Pistons Removal

>>>>>>>> **CAUTION** <<<<<<<<

Two vise-grip ratcheting chain wrenches are needed to remove the hydraulic pistons. Do not attempt to remove the Secondary Cylinder Cap(2) without these as the Piston-Cylinder (6) may become damaged.

1. Disconnect the shop air from the ETJ Under-the-Hoist Jack. The Tank (28) must be completely free of compressed air prior to the following operations.

2. Connect the "J" hook of the Transmission Tie-down Strap (80) into the milled end of the Upper Tilt Pivot Pin (83) and form the tightest loop possible.

3. Using a portable floor crane, chain hoist, come-along, etc. that's capable of lifting at least 80 inches from the floor, hook into the above strap loop. Press the Foot Valve Control (69) all the way down on its right (intake) side and keep it depressed. Slowly lift the load pistons (3)(6) up to their fullest extensions, but don't lift the jack!

4. Release the Foot Valve Control (69) allowing it to return to its relaxed position (neutral). Lower the lifter that was used to raise the load pistons (3)(6) to where the Transmission Tie-down Strap (80) just starts to relax.

5. Fold a shop rag three or four times and wrap it around the Piston-Cylinder (6) where it goes into the Main Cylinder Cap (8). Wrap the chain of one of the vise-grip ratcheting chain wrenches over the rag just above the Main Cylinder Cap and tighten the wrench.

6. Fold another shop rag three or four times and wrap it around the top third of the Secondary Cylinder Cap (2). Wrap the chain of the second vise-grip ratcheting chain wrench over the rag and tighten where the chain is just below the top of the Cap.

7. Loosen the Secondary Cylinder Cap (2) from the Piston-Cylinder (6). It may require a sharp rap with a mallet against the wrench to break the Cap loose.

>>>>>>>> **CAUTION** <<<<<<<<

Do not proceed to remove the Upper Piston without the chain wrench in place on the Piston-Cylinder (6) as the Piston-Cylinder may rapidly retract back into the main jack cylinder causing oil to cascade out over the top.

8. Unscrew the Secondary Cylinder Cap (2) completely. Press down hard on the right (intake) side of the Foot Valve Control (69) and keep it depressed. Lift the Upper Piston (3) out slowly; and then release the Foot Valve Control.

9. If the Upper Piston (3) will be reinstalled without the removal of the Piston-Cylinder (6), press the Foot Valve Control (69) down on its left (exhaust) side until the oil in the Piston-Cylinder is about 8 inches from the top, then go to step 11 of the LOAD PISTONS INSTALLATION section.

10. Press the Foot Valve Control (69) all the way down on its left (exhaust) side and engage the Release Locking Pin (66) on the top of the tab welded on the side of the Tank (28).

11. Release the vise-grip ratcheting chain wrench that's tightened to the Secondary Cylinder Cap (2), but NOT the one on the Piston-Cylinder (6). Put the shop rag around the top third of the Main Cylinder Cap (8); wrap the chain of the wrench over the rag and just under the top of the Cylinder Cap; and tighten the wrench.

12. When the oil has retracted below the bottom of the Piston-Cylinder (6), unscrew the Main Cylinder Cap (8) completely and carefully raise the Piston-Cylinder out of the jack's main cylinder. Be very careful not to damage the Piston-Cylinder.

13. It is highly recommended that the Tank Sealing O'Ring (29) be left in its groove unless it allows air to escape from the tank. If it's to be removed, don't use a sharp tool!

Load Pistons Installation

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

Two vise-grip ratcheting chain wrenches are needed to install the hydraulic pistons. Do not attempt installation without them as damage to the caps and pistons may occur.

1. If it was necessary to replace the Tank Sealing O'Ring (29), liberally grease the O'Ring. With an o'ring installation tool or a small dull screw driver, push a portion of the O'Ring into the groove. Move about 3/4 to 1 inch and push that portion into the groove. Gently press the hump down into the groove as you work towards where you were before. Continue this process until the O'Ring is completely down in the groove with no humps.

2. Spread a film of grease on the outside smooth portion of the main cylinder that protrudes out of the jack's tank top (28).

3. Inspect and clean the Main Cylinder Cap (8) so it is absolutely free of dirt and grit. Install the Wiper Ring (7) into the groove on top of the Cap.

4. Inspect and clean the inside and outside of the Piston-Cylinder (6) so it is absolutely free of dirt and grit. Bathe the Piston-Cylinder O'Ring (5) in hydraulic oil and gently slide it over the bottom of the Piston-Cylinder and up into the groove.

5. Spread a liberal amount of hydraulic oil over the entire lower guidance portion of the Piston-Cylinder (6) including its top shoulder. Slide the Main Cylinder Cap (8) down over the top of the Piston-Cylinder carefully making sure the Wiper Ring (7) doesn't snag on the threads. Lower it until it rests on top of the lower guidance portion of the Piston-Cylinder.

6. Fold a shop rag three or four times and wrap it around the Piston-Cylinder (6) about 1 1/2 inches above the Main Cylinder Cap (8). Wrap the chain of one of the vise-grip ratcheting chain wrenches over the rag and tighten.

7. Apply some hydraulic oil to the top inside of the main cylinder that protrudes out of the jack's Tank (28) top. Slowly and carefully lower the Piston-Cylinder (6) into the main cylinder. While slightly turning the Piston-Cylinder clockwise, apply a little downward pressure until the O'Ring is compressed and into the main cylinder. Tighten the Main Cylinder Cap (8) down on the cylinder by hand as far as possible.

8. Fold a shop rag three or four times and wrap it around the top third of the Main Cylinder Cap (8); wrap the chain of the other chain wrench over the rag and just under the top of the Cylinder Cap; and tighten the wrench.

9. Tighten the Main Cylinder Cap (8) against the Tank's (28) top plate with moderate pressure (the Cap must be touching all the way around). Wipe off the excess grease.

10. Connect the shop air to the jack and press down the Foot Valve Control (69) on the right (intake) side until the oil level in the Piston-Cylinder (6) is about 8" from the top.

11. Inspect and clean the Secondary Cylinder Cap (2) so its absolutely free of dirt and grit. Install the Wiper Ring (1) into the Cap's groove. Inspect and clean the Upper Piston (3) so its absolutely free of dirt and grit. Bathe the Upper Piston O'Ring (4) in hydraulic oil and gently slide it over the bottom of the Upper Piston and up into the groove.

12. Spread a liberal amount of hydraulic oil over the entire lower guidance portion of the Upper Piston (3) including its top shoulder. If necessary slide the Secondary Cylinder Cap (2) down over the top of the Upper Piston carefully making sure the Wiper Ring (1) doesn't snag the hole.

>>>>>>>> **CAUTION** <<<<<<<<

Either have the Lifting Head Assembly attached to the Upper Piston (3) at this time; or temporarily put the Lower Rocker Pin/Axle (91) through the Upper Piston's hole. This will insure that the Upper Piston can not go too deep into the Piston-Cylinder (6).

13. Apply some hydraulic oil to the top inside of the Piston-Cylinder (6). Slowly and carefully lower the Upper Piston (3) into the Piston-Cylinder. If the Upper Piston's O'Ring (4) doesn't compress and enter the Piston-Cylinder, apply a little downward pressure on the Upper Piston while turning it one way or the other. Thread the Secondary Cylinder Cap onto the Piston-Cylinder by hand.

14. Remove the chain wrench and shop rag from the Main Cylinder Cap (8). With the rag folded 3 or 4 times, wrap it around the top third of the Secondary Cylinder Cap (2). Wrap the chain of the chain wrench over the rag and tighten where the chain is just below the top of the Cap. Tighten the Cap onto the Piston-Cylinder (6). It is suggested that the chain wrench around the Cap be rapped a couple of times with a mallet to insure that the Cap is "locked" in place. Remove both chain wrenches and the shop rags.

15. Press the Foot Valve Control (69) down on the left (exhaust) side until both the Piston-Cylinder (6) and the Upper Piston (3) are fully lowered. This will "bleed" the air out of the hydraulic cylinder.

Lifting Head Assembly

1. Press the Foot Valve Control (69) down on the right (intake) side until the top of the Upper Piston (3) is about chest high.

2. Spread a film of grease on the Lower Rocker Pin/Axle (91) and put the Snap Ring (93) on one end only. Slide one of the Lower Rocker Rollers (92) onto the Pin/Axle and up against the Snap Ring. Spread a film of grease on the side of the Rocker Roller that'll be up against the Lower Rocker Weldment (86).

3. Put the Shaft Tilt Insert (89) into the top of the Upper Piston (3). Put some hydraulic oil on the threaded rod that's anchored to the Lower Rocker Weldment (86) and thread the rod into the receiving threaded hex bar of the Shaft Tilt Insert (89) until the threaded rod sticks out below the threaded hex bar about 1 inch.

4. Lower the Lower Rocker Weldment (86) over the Shaft Tilt Insert (89) and the Upper Pistion (3). Pass the Lower Rocker Pin/Axle (91) 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 until the Rocker Roller (92) is up against the Lower Rocker Weldment.

5. Spread a film of grease on the side of the Lower Rocker Roller (92) that'll be up against the Lower Rocker Weldment (86) and slide it on over the Lower Rocker Pin/Axle (91). With a pair of 90 degree snap ring pliers, place the second Snap Ring (93) in its groove next to the Rocker Roller. Make sure both Rollers freely turn.

6. Put some hydraulic oil on the threaded rod that's anchored to the Upper Lifting Head (85) and thread the rod into the receiving threaded hex bar of the Lower Rocker Weldment (86) until the threaded rod sticks out below the threaded hex bar about 1 inch.

7. Install a Snap Ring (84) onto the Upper Tilt Pivot Pin (83) in the groove next to the tube. Spread a film of grease over the section of the Pin between the snap ring grooves. Lower the Upper Lifting Head (85) over the Lower Rocker Weldment (86). Pass the Pin through the Upper Lifting Head and the Lower Rocker Weldment so that the milled portion of the Pin is over the threaded rod that's anchored to the Lower Rocker Weldment. Install a Snap Ring (84) into the groove next to the Pin's milled portion.

8. If necessary, thread a Jam Nut (87) onto the threaded rod that's anchored to the Lower Rocker Weldment (86); and onto the one anchored to the Upper Lifting Head (85). Thread the Tilt Crank Wing or Knob (88) 5/8 to 3/4 inch onto each threaded rod. Tighten the Jam Nuts against the Wing or Knob with sufficient force to "lock" them in place.

9. Turn the Upper Tilt Pivot Pin (83) to where the tube welded to it is on top. Install the Transmission Tie-down Strap (80) to the Pin with the cam lever of the buckle out away from the Upper Lifting Head (85) when the buckle is straight up and down.

ETJ & ETJ-EH PARTS LIST

ITEM NO.	*PART NO.*	*DESCRIPTION*	*QTY.*
		ETJ Under-the-Hoist Jack	
1	5322	2 1/2" 959 WIPER RING	1
2	ETJA-57	SECONDARY CYLINDER CAP	1
3	ETJA-RSS	UPPER PISTON	1
4	5242	334 2 5/8" x 3" O'RING	1
5	5254	342 3 5/8" x 4" O'RING	1
6	ETJA-RSP	PISTON-CYLINDER	1
7	5330	3 1/2" 959 WIPER RING	1
8	ETJA-57	MAIN CYLINDER CAP	1
9	8090	1000 LB. CAPACITY STICKER	1
10	8040	MHC PRODUCT STICKER	1
11	5750	1/4" NPT HHP-S HOLLOW HEX PLUG	1
12	8050	OIL LEVEL STICKER	1
13	8048	ETJ WARNING/INSTRUCTION STICKER	1
14	7890	BRASS OVAL I.D. TAG	1
15	7895	#2 3/16" SH "U" DRIVE SCREW	2
16	6700	3100-50 1/2" SNAP RING	2
17	7880	WHITE HANDLE GRIP	2
18	ETJA-H	TRANSPORT HANDLE	1
19	ETJA-110	TRANSPORT HANDLE PIN	1
20	5553	1/4" NPT x 10" AIR HOSE - INCOMING	1
21	5630	1/4" NPT STRAIGHT SWIVEL FITTING	1
22	5550	1/4" NPT x 9 1/2" AIR HOSE - TANK	1
23	5635	1/4" NPT 45 DEGREE SWIVEL FITTING	1
24	9000	SMALL 1/8" AIR GAUGE	1
25	5800	SMALL 1/4" AIR REGULATOR	1
26	5680	1/4" NPT MALE COUPLING NIPPLE	1
27	ETJA-109	AIR RECEIVING SCREEN	1
28	ETJA-F	FRAME (with legs welded on)	1
28	ETJA-FKD	FRAME (leg knock-down design)	1
29	5275	246 4 1/2" x 4 3/4" TANK O'RING	1
30	5785	160 psi SAFETY POP-OFF VALVE	1
31	5661	1/4" NPT PIPE FEMALE TEE	1
32	5679	1/4" NPT PIPE MALE NIPPLE	1
33	5795	1/4" MINI AIR MUFFLER	1
34	5641	1/4" NPT 90 DEGREE STREET ELBOW	1
35	(see item no. 20 above)		

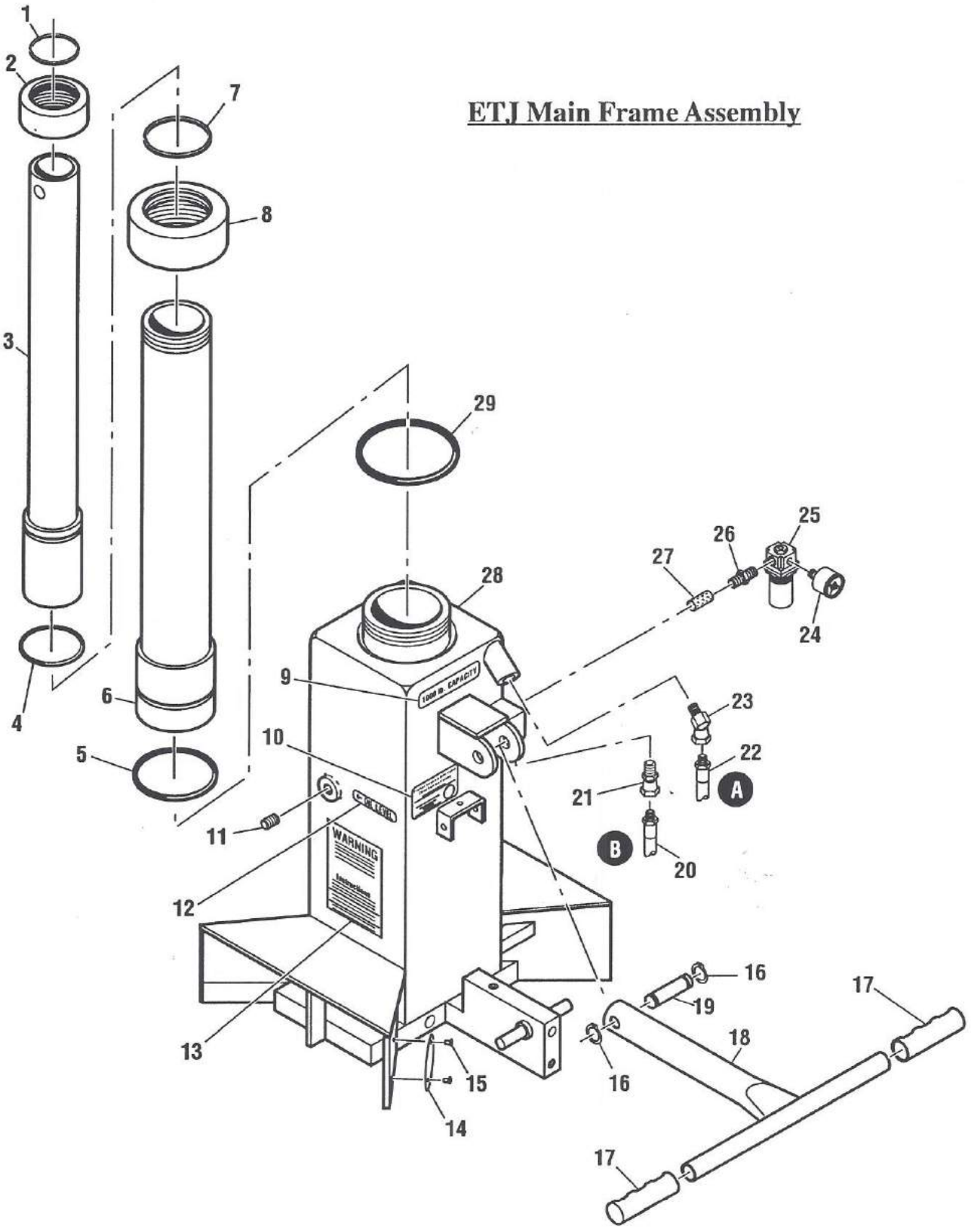
ITEM NO.	*PART NO.*	*DESCRIPTION*	*QTY.*
36	5750	1/4" NPT HHP-S HOLLOW HEX PLUG	2
37	5790	HUMPREY 42PP TAC AIR VALVE	1
38	(see item no. 22 above)		
39	6609	5/16" SAE FLAT WASHER	4
40	6251	3/8" x 3/4" NC HH BOLT ZP	1
41	6610	3/8" SAE FLAT WASHER	1
42	8005	M.H.C. CORPORATE 2 1/2" DECAL	1
43	8940	3/8" NEOPRENE RUBBER 3/4" x 1 1/2"	1
44	ETJA-J	AIR VALVE COVER (only)	1
45	6240	5/16" x 3/4" NC HH BOLT	2
46	8049	ETJ SAFETY VALVE WARNING	1
50	6015	3/8-16 x 3/8" HEX SOC SET SCREW	1
51	---------	TREADLE SUPPORT BLOCK (part of #28)	
52	ETJA-I	HYDRAULIC VALVE ROCKER	2
53	6225	SPECIAL 5/16" PIVOT BOLT	2
54	6020	5/16" NC HEX LOCK NUT	2
55	5918	7/16" GR25 BALL BEARING	2
56	5222	204 3/8" x 5/8" O'RING	2
57	ETJA-72	EXHAUST VALVE STEM	1
58	6027	3/8"-24 NF HEX FINISH JAM NUT	2
59	ETJA-70	VALVE STEM CONNECTOR	2
60	7431	VALVE COMPRESSION SPRING	2
61	ETJA-63	SPRING COMPRESSION PLATE	1
62	6300	1/2" x 1" NC HH BOLT	1
63	ETJA-69	TREADLE PIVOT PIN	1
64	ETJA-71	INTAKE VALVE STEM	1
65	6700	3100-50 1/2" SNAP RING	1
66	ETJA-67	RELEASE LOCKING PIN	1
67	7420	F4 COMPRESSION SPRING	1
68	ETJA-G	FOOT VALVE CONTROL (only)	1
69	ETJA-GA	FOOT VALVE CONTROL ASSEMBLY	1
70	7443	AIR VALVE EXTENSION SPRING	2
71	ETJA-96	TREADLE LEVELING THREADED ROD	1
72	6025	3/8" NC NEX NUT	2
73	ETJA-K	AIR VALVE KICKER	1
80	9210	TRANSMISSION TIE-DOWN STRAP	1
81	6016	1/4" NC HEX NUT	1
82	6200	1/4" x 1 1/2" NC HH BOLT	1
83	ETJA-U	UPPER TILT PIVOT PIN	1
84	6710	3100-75 3/4" SNAP RING	2

ITEM NO.	*PART NO.*	*DESCRIPTION*	*QTY.*
85	JCET-G	UPPER LIFTING HEAD	1
86	ETJA-N	LOWER ROCKER WELDMENT	1
87	6055	5/8"-18 NF FINISH JAM NUT	2
88	ETJA-T	TILT CRANK WING or KNOB	2
89	ETJA-M	SHAFT TILT INSERT	1
90	7580	1/4"-28 x 1/2" GREASE FITTING	2
91	ETJA-99	LOWER ROCKER PIN/AXLE	1
92	ETJA-100	LOWER ROCKER ROLLER	2
93	6710	3100-75 3/4" SNAP RING	2
100	ETJA-FKD	FRAME (leg knock-down design)	1
101	8010	M.H.C. CORPORATE 5" DECAL	1
102	ETJA-LA	REMOVABLE LEG (with caster assembled)	4
103	6320	1/2" x 3" NC HH BOLT	4
104	ETJA-80	LEG RETENSION WASHER	4
105	ETJA-L1	REMOVABLE LEG (only)	4
106	7249	21-4 4" CASTER w/P.C. WHEEL	4
107	6025	3/8"-16 NC HEX NUT	16
108	6250	3/8" x 3/4" NC HH BOLT	16
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	12
115	ETJA-X	TRANSMISSION PAN SUPPORT	4
116	6310	1/2" x 2" NC HH BOLT ZP	4

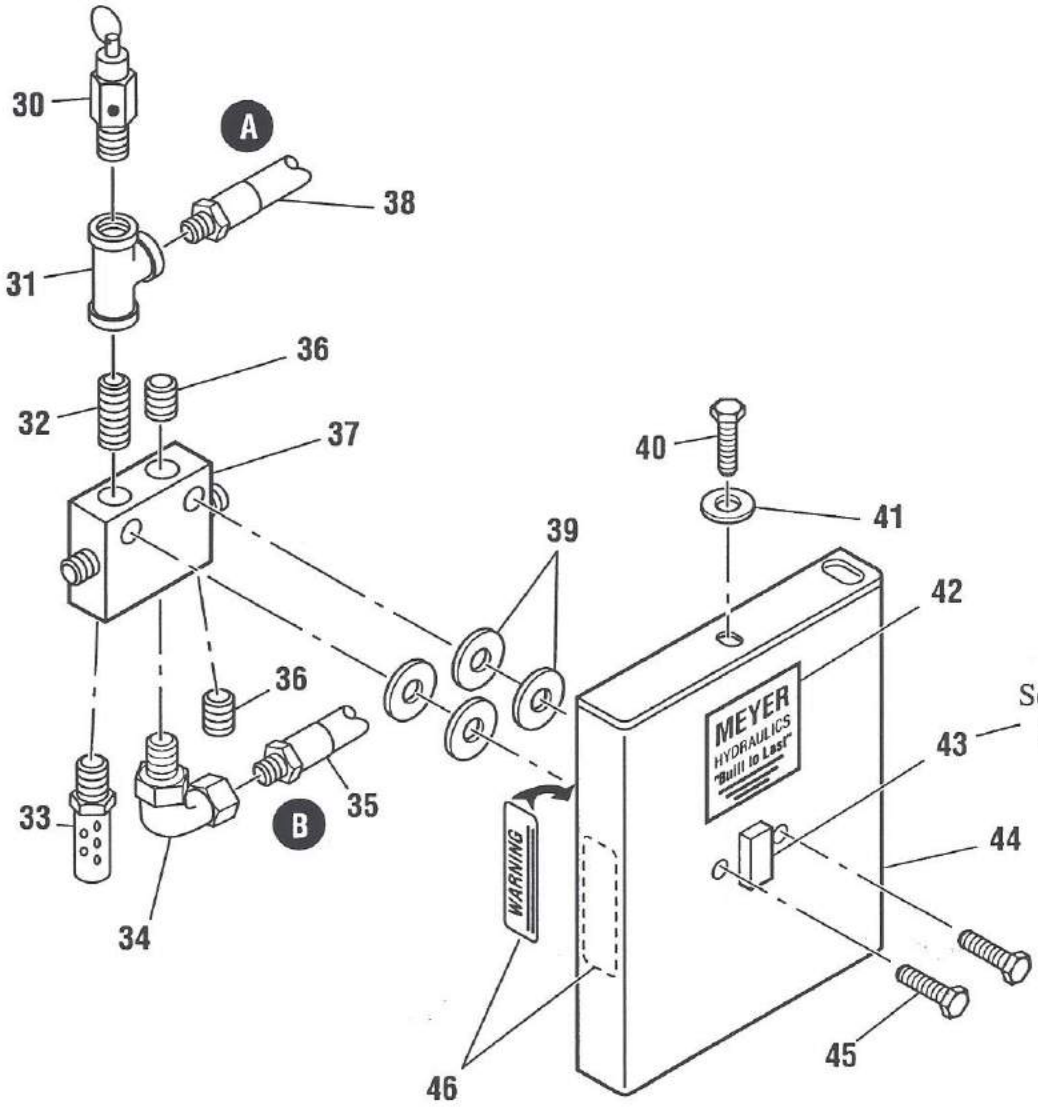
ETJ-EH Engine Support Head

120	JCET-25	PROTECTION RUBBER PAD	1
121	6247	5/16" x 4 1/2" NC CARRIAGE BOLT	4
122	JCET-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	JCET-J	LEFT MOTOR BASE SLIDE	2
126	6300	1/2" x 1" NC HH BOLT	4
127	JCET-I	RIGHT MOTOR BASE SLIDE	2
128	JCET-H	MOTOR SUPPORT HEAD FRAME	1
129	8017	ETJ-EH WARNING STICKER	2
130	9200	RATCHET SAFETY TIE-DOWN STRAP	2

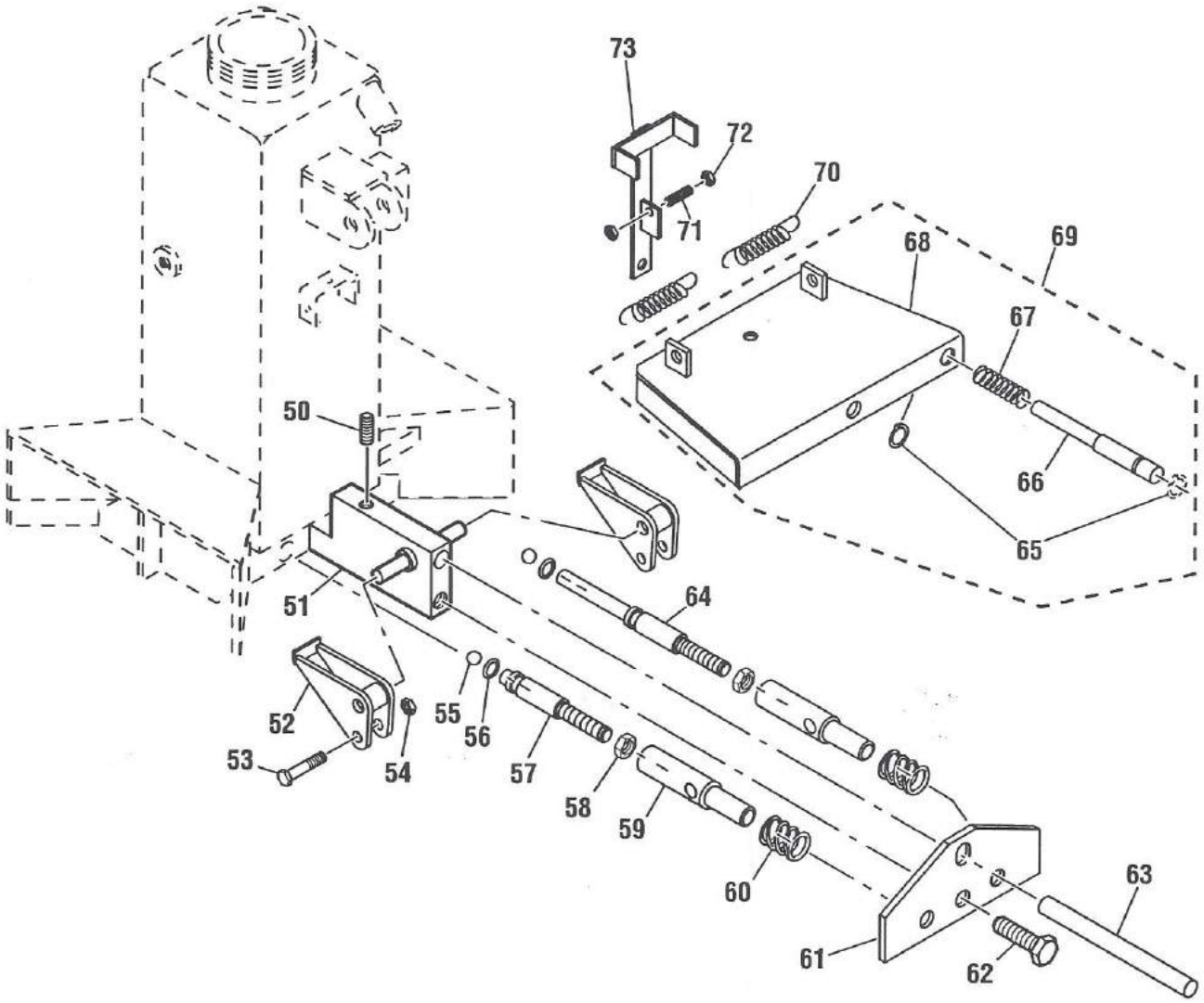
ETJ Main Frame Assembly



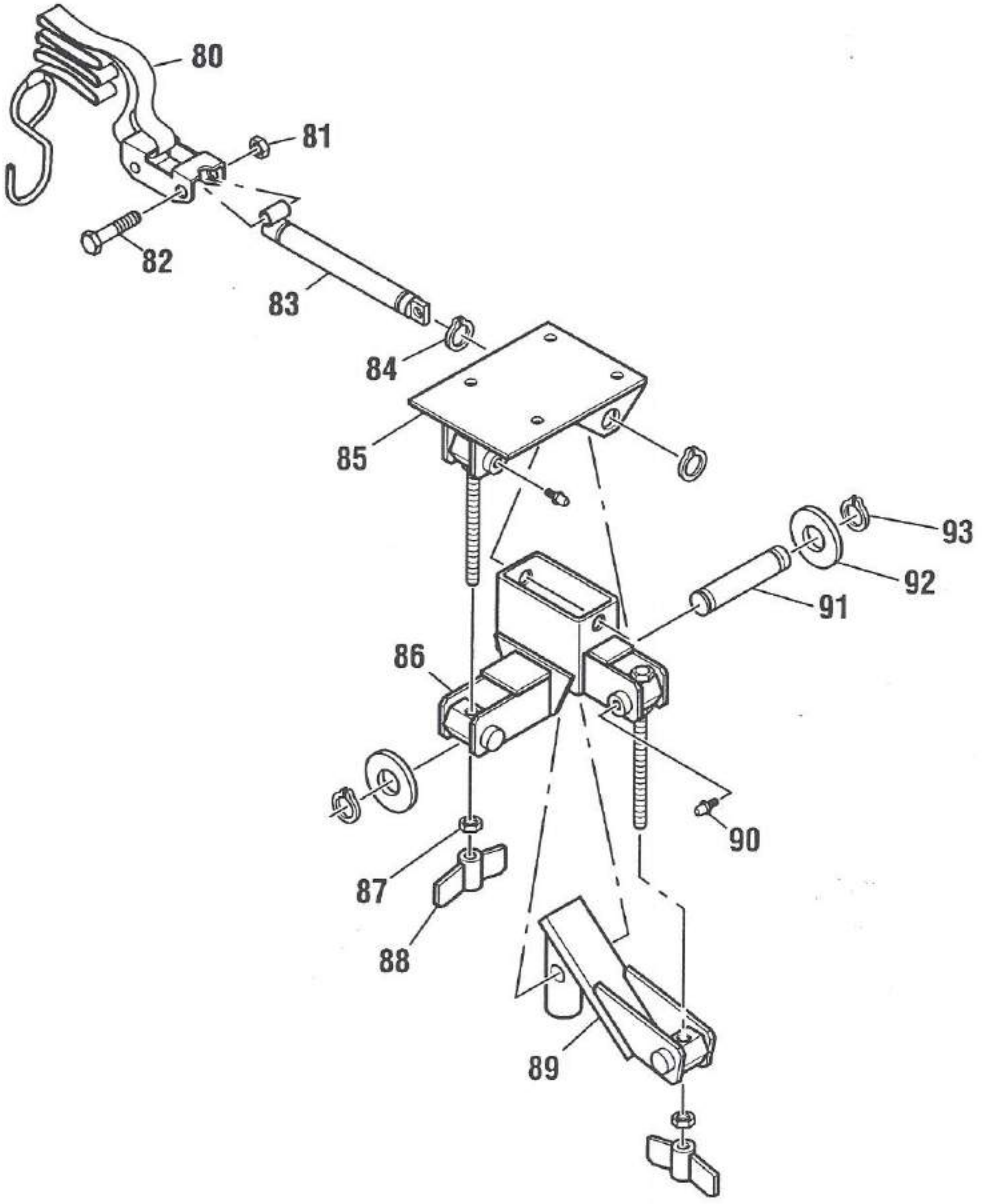
ETJ Air Valve Cover Assembly

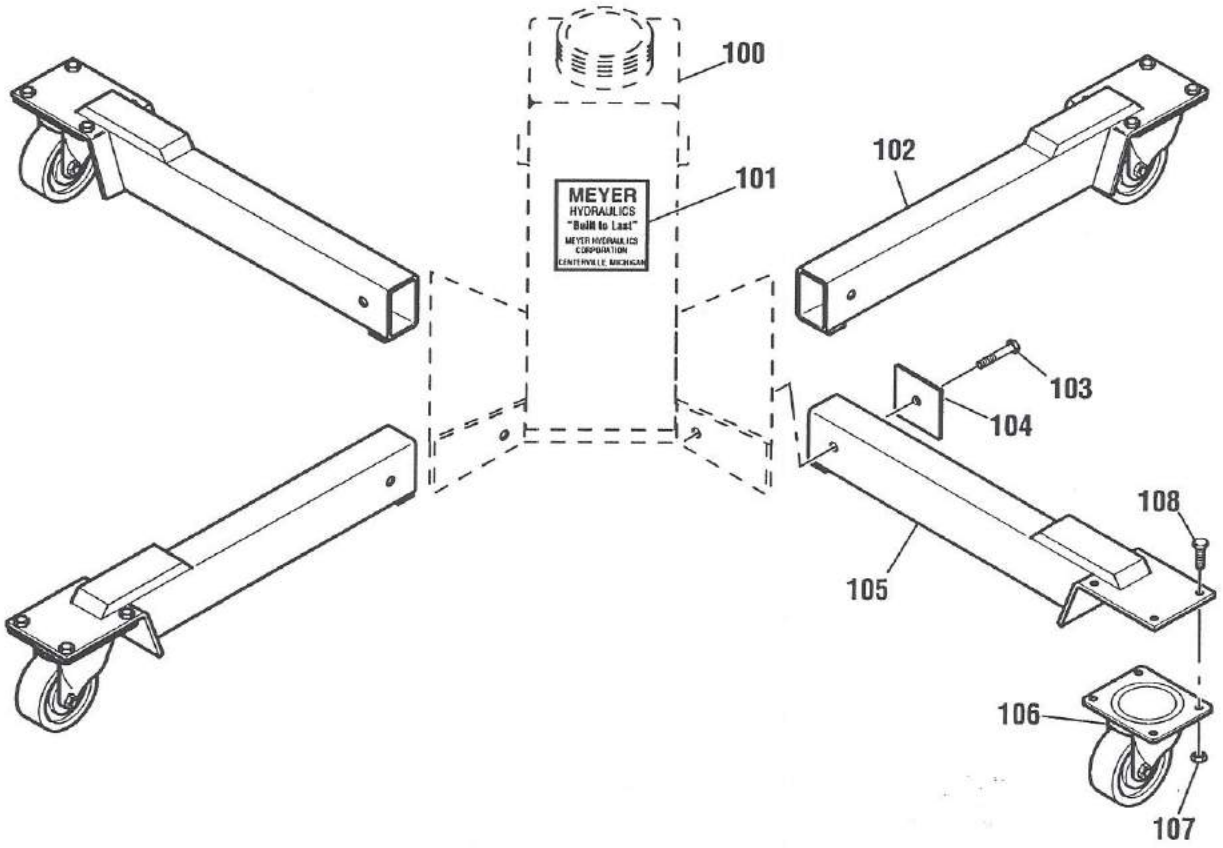


ETJ Foot Valve Control Assembly

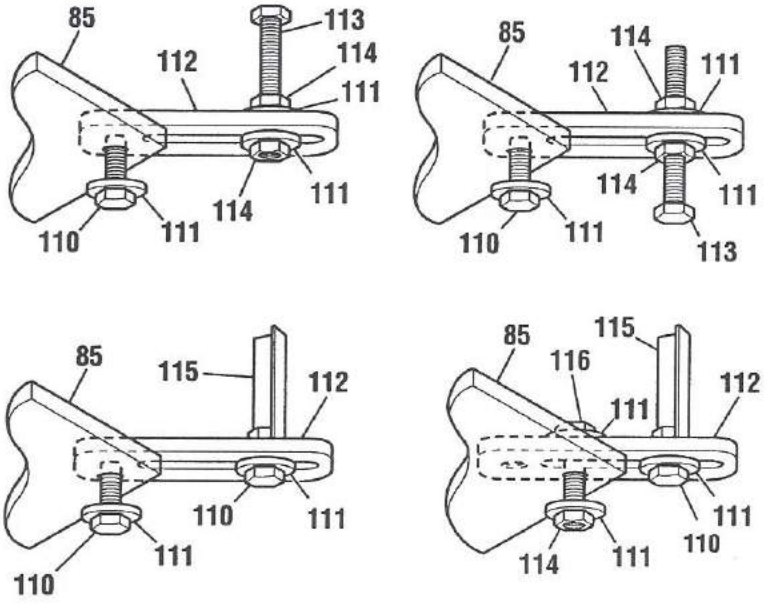


ETJ Lifting Head Assembly

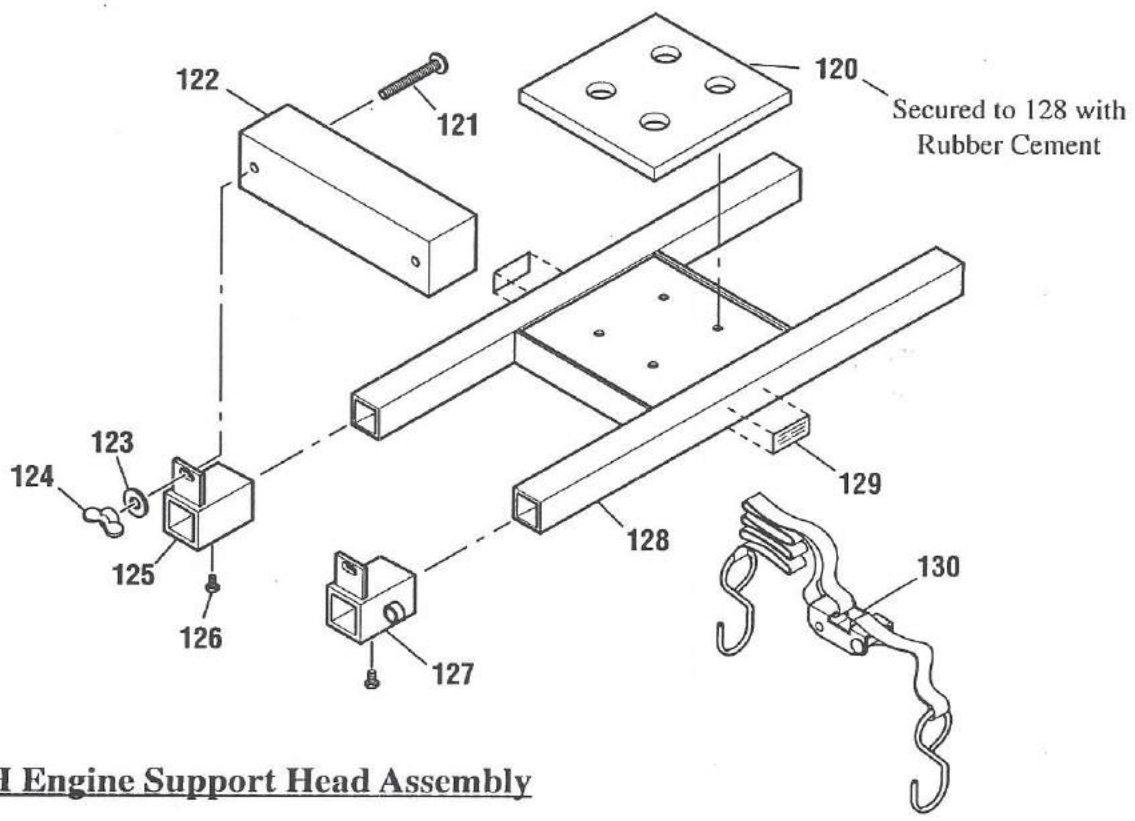




ETJ Removable Leg Assembly



Support Arm Assembly Configurations



ETJ-EH Engine Support Head Assembly