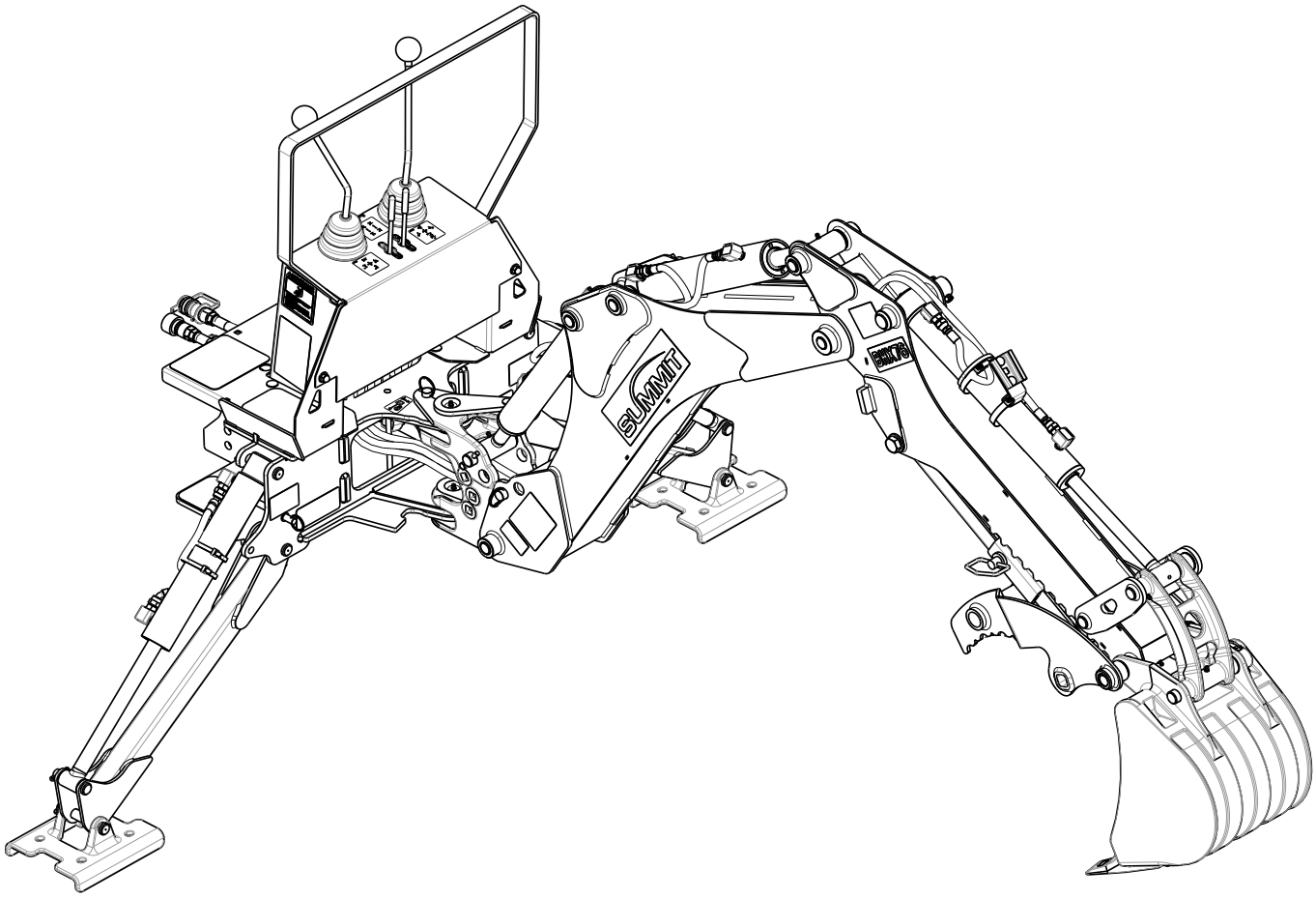
SUMMIT TRACTORS

MODEL BHX76
BACKHOE

BHX SERIES

INCLUDES OPERATOR'S MANUAL & PARTS CATALOG

SERIAL NUMBER 10001 AND LATER



SMB1673
NO. 032679

WARRANTY CONDITIONS

Warranty Coverage:

Summit Tractors warrants BHX Series Backhoes purchased from Summit Tractors or an authorized Summit Tractors retailer by the original purchaser to be free from defects in material and workmanship for a period of twenty four (24) months from date of purchase.

Warranty Does Not Include:

1. Transportation to servicing dealer's business location or, at the option of the original retail purchaser, the cost of a service call.
2. Used equipment.
3. Normal maintenance service and wear items.
4. Repairs or adjustments caused by improper use; failure to follow recommended maintenance procedures, accidents or other casualty.
5. Liability of incidental or consequential damages of any type, including but not limited to lost profits or expenses of acquiring replacement equipment

Right To Make Design and Product Changes:

Summit Tractors reserves the right to make changes in the design and other changes in its Summit Tractors Products at any time without incurring any obligation with respect to any product previously ordered, sold, or shipped.

California Proposition 65

WARNING: Cancer and reproduction harm - www.P65Warnings.ca.gov

CONGRATULATIONS

You are now the proud owner of a Summit Tractors Backhoe. This Backhoe is a product of quality engineering and manufacturing. It is made of fine materials and under a rigid quality control system. It will give you long, satisfactory service. To obtain the best use of your Backhoe, please read this manual carefully. It will help you become familiar with the operation of the Backhoe and contains many helpful hints about Backhoe maintenance. The immediate use of new techniques in the manufacture of products may cause some small parts of this manual to be outdated. Summit Tractor dealers will have the most up-to-date information. Please do not hesitate to consult with them.

Because Summit Tractor maintains an ongoing program of product improvement, we reserve the right to make improvements in design or changes in specifications without incurring any obligation to install them on units previously sold.

Because of the possibility that some photographs in this manual were taken of prototype models, production models may vary in some detail. In addition, some photographs may show shields removed for purposes of clarity. Never operate this implement without all shields in place.

RETAIL CUSTOMER'S RESPONSIBILITY UNDER THE SUMMIT TRACTOR WARRANTY

It is the Retail Customer and/or Operator's responsibility to read the Operator's Manual, to operate, lubricate, maintain, and store the product in accordance with all instructions and safety procedures. Failure of the operator to read the Operator's Manual is a misuse of this equipment.

It is the Retail Customer and/or Operator's responsibility to inspect the product and to have any part(s) repaired or replaced when continued operation would cause damage or excessive wear to other parts or cause a safety hazard.

It is the Retail Customer's responsibility to deliver the product to the authorized Summit Tractor dealer from whom it was purchased, for service or replacement of defective parts which are covered by warranty. Repairs to be submitted for warranty consideration must be made within forty-five (45) days of failure.

It is the Retail Customer's responsibility for any cost incurred by the Dealer for traveling to or hauling of the product for the purpose of performing a warranty obligation or inspection.

IMPORTANT SAFETY PRECAUTIONS

UNDERSTAND SIGNAL WORDS

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE is used to address practices not related to physical injury.

SAFETY ALERT SYMBOL

This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel in the operation, transport, maintenance and storage of equipment. Lack of attention to safety can result in accident, personal injury, reduction of efficiency and worst of all – loss of life. Watch for safety hazards and correct deficiencies promptly. Use the following safety precautions as a general guide to safe operations when using this machine. Additional safety precautions are used throughout this manual for specific operating and maintenance procedures. Read this manual and review the safety precautions often until you know the limitations. Do not allow children or untrained persons to operate equipment. Do not operate equipment under the influence of drugs or alcohol.

THE TRACTOR AND LOADER

1. Read the tractor and loader operator's manual to learn how to operate your tractor and loader safely. Failure to do so could result in serious injury or death and equipment damage.

2. It is recommended that tractor be equipped with Rollover Protective System (ROPS) and seat belt used for all loader operations. Keep foldable ROPS systems locked in the up position at all times when operating the backhoe.

3. Add wheel ballast or front weight for stability.

4. Move wheels to the tractor manufacturer's widest recommended settings to increase stability.

5. Move and turn the tractor at low speeds.

6. Stop tractor engine, place transmission in park (or neutral), engage parking brake, lower loader arms to ground, cycle all hydraulic controls to relieve pressure, allow machine moving parts to stop, remove ignition key to prevent unauthorized person from starting before tractor or servicing, repairing, or making adjustments to the equipment.

7. Wear personal protective equipment (PPE), such as, but not limited to, protection for eyes, ears, lung, head, hands and feet when operating, servicing, or repairing equipment. Avoid wearing loose clothing or jewelry that may catch and entangle on equipment moving parts.

THE BACKHOE

1. DO NOT operate the backhoe unless it is rigidly attached to the tractor.

2. KNOW your controls. Read this operator's manual and the manual provided with your tractor. Learn how to stop the tractor, the engine and the backhoe quickly in an emergency.

3. PROVIDE adequate front end weight to counter-balance the backhoe at all times. 20% of the total tractor, loader and backhoe weight must be on the tractor front axle. If unsure of weight distribution, determine at a weight scale. Total vehicle weight, including backhoe and counter weights, must not exceed the ROPS certificate for gross vehicle weight.

4. BE SURE the area is clear of overhead or underground utility hazards. Consult local Utilities before digging. Do not leave the operator's seat if any part of the tractor, loader, or backhoe contacts electric lines or underground cables.

5. POSITION a barricade around the work area.

6. KEEP all bystanders a safe distance away.

7. DO NOT attempt to enter operator's platform of backhoe by using the stabilizers as a step.

8. OPERATE from the backhoe operator's seat only.

9. ALLOW only one person to operate the backhoe at any time.

10. DISENGAGE safety locks as shown before attempting to operate the backhoe.

11. NEVER dig with the backhoe unless the stabilizers are properly set.

12. DO NOT dig under stabilizers or tractor backhoe. Soft ground or sand soil can cause cave-ins.

13. KEEP BUCKET away from the stabilizer area to avoid possible stabilizer damage.

14. ALWAYS swing bucket uphill to dump when on a hillside and keep loaded bucket low.

15. SET BRAKES and block wheels when operating on hills and banks to avoid dangerous runaway.

16. WATCH for overhead wires. DO NOT touch wires with any part of the backhoe.

17. NEVER allow a person to work under a raised bucket.

18. NEVER lift a person with the backhoe.

19. DO NOT use the backhoe as a battering ram. Use the backhoe only for digging.

20. ALWAYS lower the backhoe bucket and stabilizers to the ground, shut off engine, and apply the parking brake before getting off unit, or when not digging.

21. NEVER leave the tractor unattended with the engine running.

22. DO NOT attempt to raise the tractor off the ground or move the tractor forward or backward using the backhoe dipperstick or bucket.

23. PROTECTIVE sleeves over hydraulic hoses must be securely fastened onto metal hose fittings. Replace if damaged.

TRANSPORTATION

1. ALWAYS engage safety locks before transporting backhoe.

2. DO NOT drive the tractor near the edge of a ditch or excavation.

3. ALWAYS use accessory lights and devices when transporting on a road or highway to warn operators of other vehicles. Check your local government regulations.

4. BE SURE the Slow Moving Vehicle (SMV) emblem is visible to the rear.

ADJUSTMENTS AND INSPECTION

1. CHECK pins that attach backhoe to tractor and all pivot pins for tightness several times daily. Replace any parts that are bent, broken or missing.

2. ALWAYS engage safety locks before servicing backhoe.

3. DO NOT oil, grease, or adjust the backhoe while it is in motion. For greasing, see Service section for details.

4. DO NOT change any backhoe relief valve settings. They are factory set for best backhoe performance and safety.

5. PROTECT YOUR EYES - WEAR SAFETY GLASSES

6. GUARD AGAINST INJURY when driving connecting pins or performing any repair in which particles can chip from work piece or striking tool.

7. DO NOT remove any guards on backhoe or tractor.

AVOID HIGH-PRESSURE FLUIDS

ESCAPING fluid under pressure can have sufficient force to penetrate the skin and cause serious injury. Be sure to stop engine and relieve all pressure before disconnecting lines. Be sure all connections are tight and that lines, pipes, and hoses are not damaged before applying pressure to the system. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood - not your hands - to search for suspected leaks.
SEE A DOCTOR at once if injured by escaping fluid. Serious infection or gangrene can develop if proper medical treatment is not administered immediately.

SERIAL NUMBER INFORMATION

A product identification label is provided for your backhoe. The numbers on this label are important if your backhoe should require dealer service, or if you need additional information on the equipment. Prior to using the backhoe for the first time, record the numbers from the identification label in the appropriate spaces provided below.

MODEL NO. _____

SERIAL NO. _____

Location: Each Side of Boom
Part No. 020435

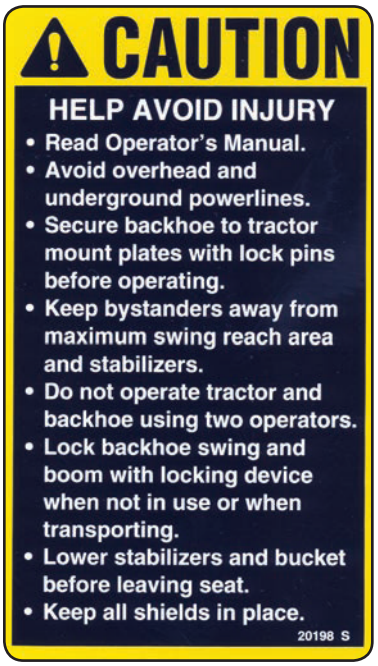
Location: Each Side of Dipperstick
Part No. 020441

SAFETY DECALS

The safety of the operator was a prime consideration in the design of the backhoe. Proper shielding, convenient controls, simple adjustments and other safety features have been built into this implement. The following decals are located on the backhoe. Keep decals clean and replace them immediately if they are missing. Contact your dealer for replacements.

Location: Right Side of Control Tower
Part No: 020138

Location: Left Side of Control Tower
Part No: 020170



Location: Right and Left Side of Control Tower
Part No: 020198

IMPORTANT FEDERAL LAWS AND REGULATIONS* CONCERNING EMPLOYERS, EMPLOYEES AND OPERATIONS.

*(This section is intended to explain in broad terms the concept and effect of the following federal laws and regulations. It is not intended as a legal interpretation of the laws and should not be considered as such).

U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

This Act Seeks:
"…to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources…"

DUTIES
Sec. 5(a) Each employer-
(1) shall furnish to each of his employees employment and a place of employment, which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees;
(2) shall comply with occupational safety and health standards promulgated under this Act.
(b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act, which are applicable to his own actions and conduct.

OSHA Regulations
Current OSHA regulations state in part: "At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved." These will include (but are not limited to) instructions to:

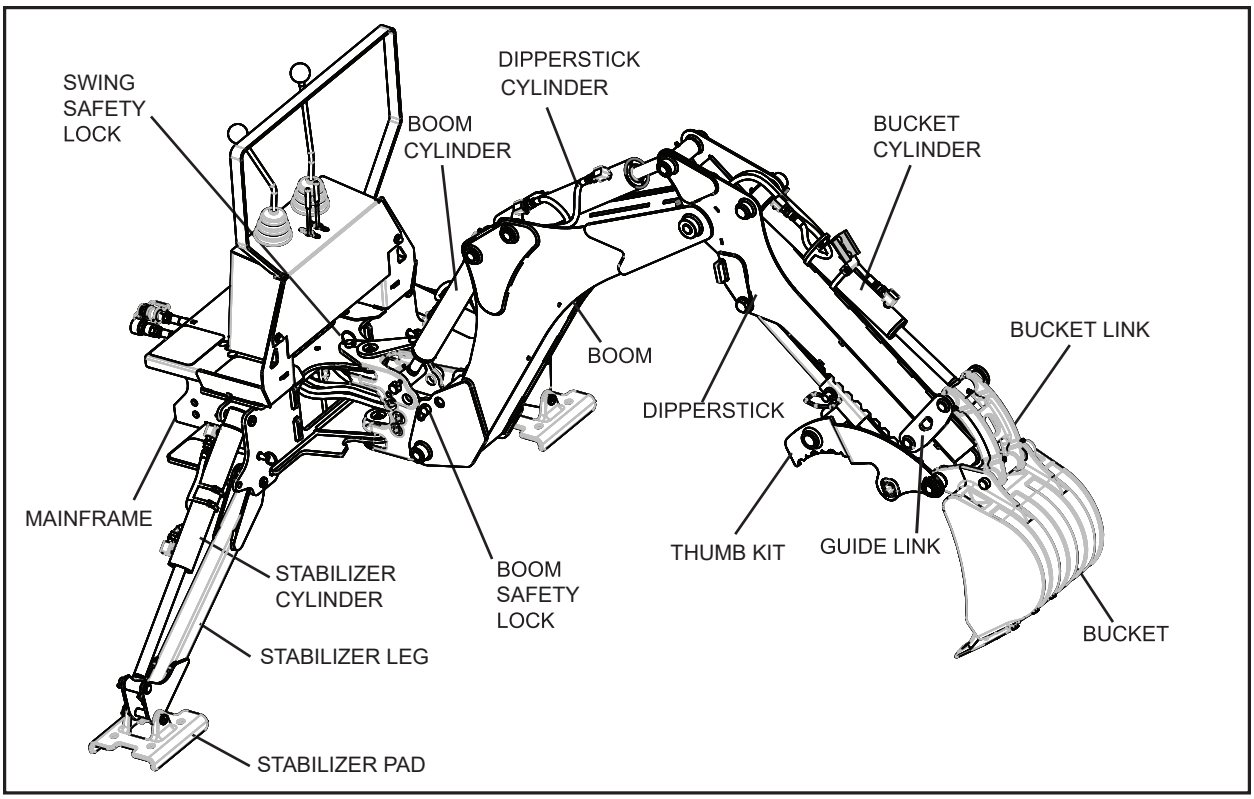
- Keep all guards in place when the machine is in operation.
- Permit no riders on equipment.
- Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which are necessary to safely service or maintain the equipment.
- Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

EMPLOYEE TRACTOR OPERATING INSTRUCTIONS:

1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going, especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly – no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
9. When tractor is stopped, set brakes securely and use park lock if available.

Child Labor Under 16 Years Old
Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situations. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.)

GENERAL OPERATION



CAUTION

To avoid possible injury, observe the following safety rules BEFORE OPERATING the backhoe.

1. BE SURE area is clear of underground utilities or other hazards.

2. POSITION barricade around work area.

3. PROVIDE adequate front end weight to counter-balance tractor at all times. 20% of the total tractor, loader and backhoe weight must be on the tractor front axle.

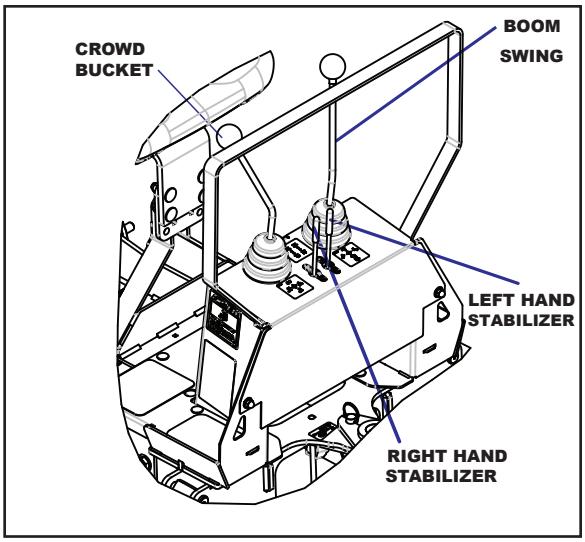
4. Keep bystanders a safe distance away.

GENERAL OPERATION

DIRECTIONS: The terms right, left, front and back shall be determined from the position of the operator when seated in the operating position on the backhoe.

ENGINE SPEED

The speed at which the backhoe operates is partially dependent on engine RPM. Use a moderate engine speed to start and increase it as your experience permits. Refer to "DIMENSIONS AND SPECIFICATIONS" for hydraulic flow volume requirements. When powering from tractor systems with higher output, reduce engine RPM to obtain acceptable backhoe operating speed.



CONTROLS

The backhoe has two major control levers plus the stabilizer control levers. These controls are located on the control panel directly ahead of the operator. The following is a list of the controls, with the function of each, reading from left to right.

1. **Boom/Swing**: Push lever forward, the boom moves down, away from the operator. Pull lever back, the boom moves up, toward the operator.

The Boom/Swing Control Lever has an added “float” function. A detent or stop should be felt when the lever is pushed forward to move the boom down. Pushing the lever forward more will overcome the detent and cause the boom to float, or move down or up freely, depending on the forces acting on it. When the lever is released it should return to the center, neutral position.

Move lever to the left, the backhoe swings to the left.

Move lever to the right, the backhoe swings to the right.

By moving the lever to one of the intermediate positions, the boom can be swung left or right at the same time it is being raised or lowered, performing the two operations simultaneously.

SWING LEFT AND LOWER the boom by moving the control lever forward and to the left.

SWING LEFT AND RAISE the boom by moving the control lever back and to the left.

SWING RIGHT AND LOWER the boom by moving the lever forward and to the right.

SWING RIGHT AND RAISE the boom by moving the lever back and to the right.

2. **Left Hand Stabilizer**: Push lever forward, the LH stabilizer lowers. Pull lever rearward, the LH stabilizer raises.

3. **Right Hand Stabilizer**: Push lever forward, the RH stabilizer lowers. Pull lever rearward, the RH stabilizer raises.

4. **Crowd/Bucket**: Push lever forward to crowd out the dipperstick (dipperstick moves away from the operator). Pull lever back to crowd in the dipperstick (dipperstick moves toward the operator). Move lever to left, the bucket curls in. Move lever to right, the bucket extends out.

By moving the lever to one of the intermediate positions, the dipperstick can be extended or retracted at the same time the bucket is being loaded or dumped.

EXTEND AND LOAD the bucket by moving the lever forward and to the left.

RETRACT AND LOAD the bucket by moving the lever back and to the left.

EXTEND AND DUMP the bucket by moving the lever forward and to the right.

RETRACT AND DUMP the bucket by moving the lever back and to the right.

The two operations of the boom lever, combined with the two operations performed by the bucket and dipperstick control lever, provide four simultaneous operations from the two levers, keeping cycle time to a minimum.

In general, the direction of movement of a control lever corresponds to the movement of the operating member.

OPERATING THE BACKHOE

CAUTION

To avoid possible injury, observe the following safety rules WHEN OPERATING the backhoe.

NOTICE: You will hear noise coming from the control valve whenever a port relief opens. The noise is normal during backhoe operation.

1. DISENGAGE safety locks as shown before attempting to operate the backhoe. Store lockpins in holes provided in floor plate.

2. OPERATE from the backhoe operator’s seat only.

3. LOWER the stabilizers until the rear of the tractor is totally supported by them. NOTE: Rear tires should not come up off of the ground.

4. DO NOT dig under the stabilizers or tractor backhoe.

5. DO NOT touch overhead wires with any part of the backhoe.

6. DO NOT attempt to raise the tractor off the ground or move the tractor forward or backward using the backhoe dipperstick or bucket.

7. DO NOT lose stability by swinging the bucket downhill when positioned on a slope.

8. DO NOT lower the backhoe boom using the “float” function. It will free fall, and could result in injury to bystanders or damage to the backhoe.

It is not difficult to become an efficient operator. Control lever operating decal is located on back of the control panel. Study, this decal. It will assist you in becoming familiar with the controls.

Smooth, light handling of the controls will result in the most efficient backhoe operation.

Operate the backhoe control levers to become familiar with their speed and movements. The engine speed and the size of the hydraulic system will determine the speed of cylinder operation. When powering from tractor systems with higher output than required, reduce engine RPM to obtain acceptable backhoe operating speed.

Swing the boom several times to practice controlling the speed of swing. Do not operate the swing more than 45° each way for the first few times, then gradually increase the arc.

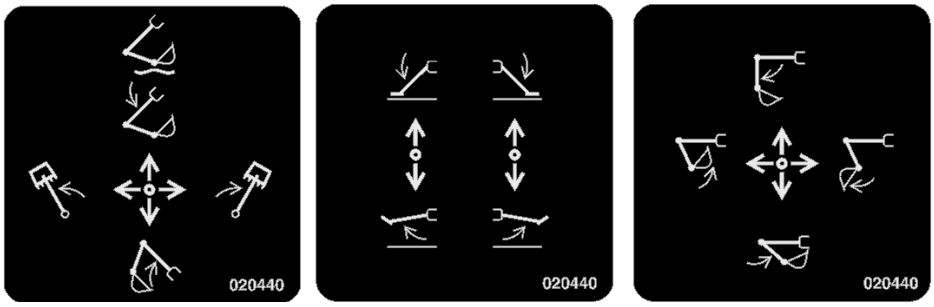
The boom “float” function may be used during digging to eliminate down pressure when cleaning the bottom of a trench. The primary purpose of the boom “float” function is to protect the operator from serious injury in the event that the backhoe or tractor hitch would fail.

Best results are obtained by digging near the center of the swing arc so material can be dumped on either side.

As the operator becomes more familiar with the operation of the backhoe, it will be common practice to operate two controls at one time. For example; with the bucket extended and the dipperstick extended, the lift control and crowd control can be operated together to bring the bucket toward the operator with down pressure on it. As the dipperstick approaches the operator, the crowd and bucket controls can be operated to close the bucket and trap the material. At the end of the stroke, the lift and crowd controls are operated to move the load up and away from the operator to save time in clearing the excavation.

This dual operation of controls will speed and simplify the digging operation. When performing dual operations with the backhoe control levers, the respective backhoe movements may not always occur simultaneously.

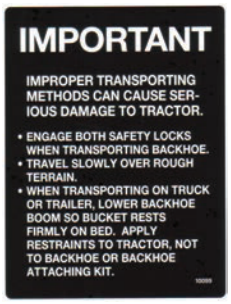
NOTICE: Actuating the bucket is the key to powerful digging. Operating the crowd and bucket controls simultaneously will insure a full bucket and prevent waste motion and time.



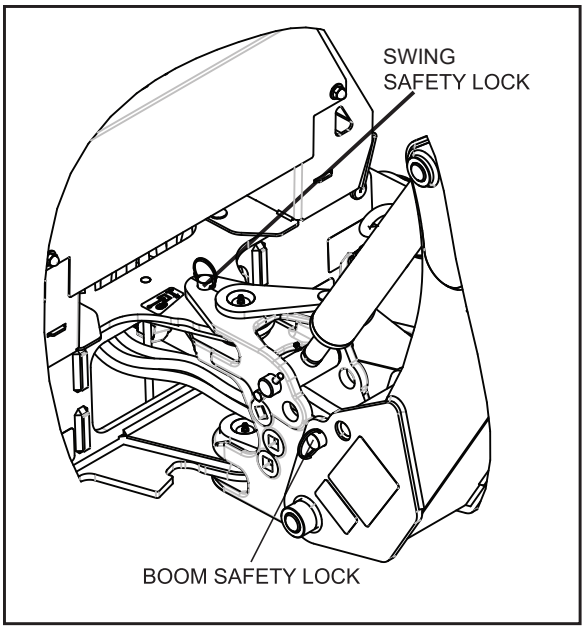
Part No. 020440
Location: Back of Control Panel

TRANSPORTING THE BACKHOE

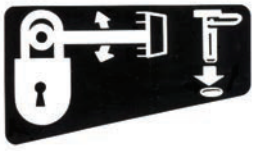
NOTICE: To prevent serious damage to the tractor, read and follow the instructions on the following decal:



Part No. 010099
Location: Right Side
of Boom



Location: Right Side of Boom
Part No. 020051



Location: Top of Main Frame
Part No. 020050

CAUTION

To avoid possible injury, observe the following safety rules when transporting the backhoe:

1. ALWAYS engage safety locks as shown In General Operation when transporting backhoe.

2. TRAVEL SLOWLY over rough terrain, on hillsides, and around curves to prevent tipping.

3. DO NOT drive the tractor near the edge of a ditch or excavation.

4. USE accessory lights and Slow Moving Vehicle (SMV) emblem when traveling on highways.

Before leaving backhoe operator's seat, position the backhoe for transport by raising boom, crowding dipperstick in, swinging to center and raising the stabilizers. ALWAYS engage safety locks as shown when transporting.

When transporting for long distances, periodically examine the backhoe and raise stabilizers and bucket back up to the full transport height. It is normal for the backhoe to slowly settle while being transported.

WHEN TRANSPORTING

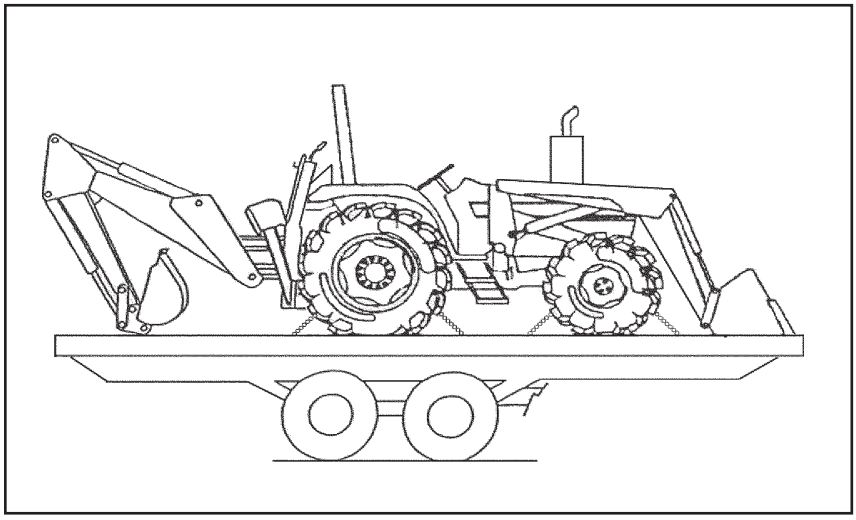
CAUTION

DO NOT CHAIN BACKHOE DOWN IN ORDER TO SECURE TRACTOR TO TRAILER.

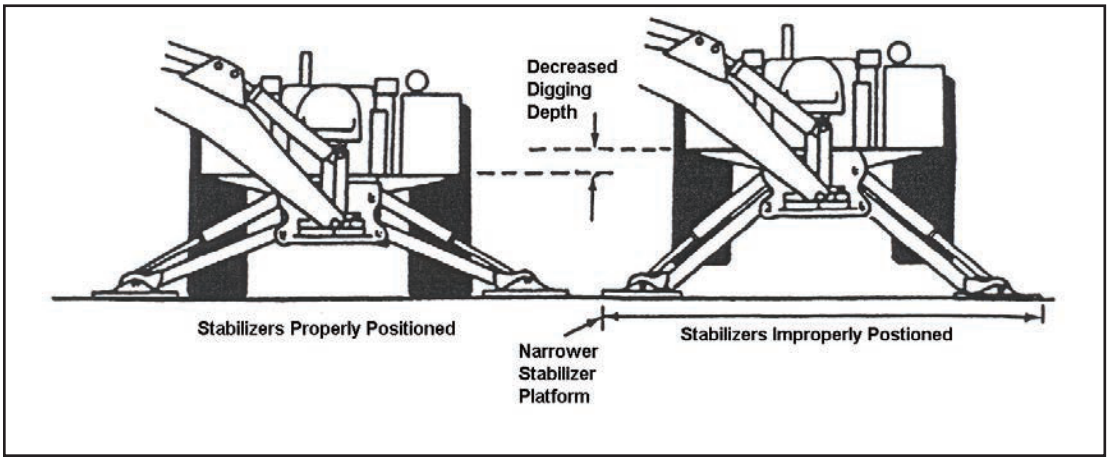
DO NOT ATTACH HOLD DOWN CHAINS ANYWHERE ON BACKHOE ASSEMBLY.

SECURE LOADER.

BUCKET SHOULD BE LOWERED TO BED WHEN POSSIBLE.



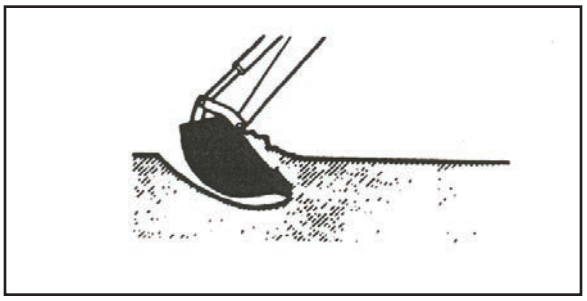
PLACING THE STABILIZERS



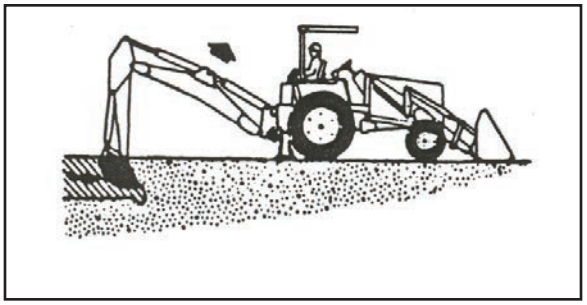
Set the stabilizers to remove weight from the rear wheels. The wheels are to remain touching the ground as this provides for the widest stabilizer stance and the lowest center of gravity. Raising the wheels off the ground will not only reduce stability and digging depth, but will impair performance and impose unnecessary stress on the unit.

FILLING THE BUCKET

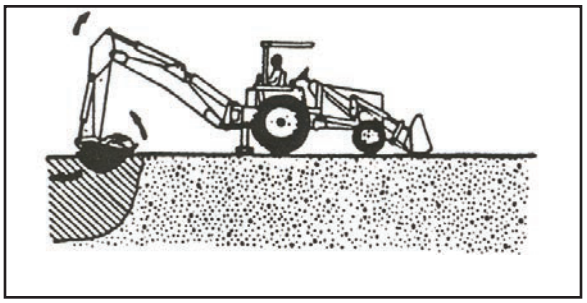
Control the bucket attitude throughout the digging cycle to keep teeth at the proper angle for best penetration. This will minimize dragging and scraping the bucket through the ground.



When digging in hard-packed soil, bucket penetration can be increased by applying down pressure with the boom while crowding in and curling the bucket. If the crowd action "stalls" it may be necessary to apply lift occasionally during the digging cycle to correct the bucket depth.

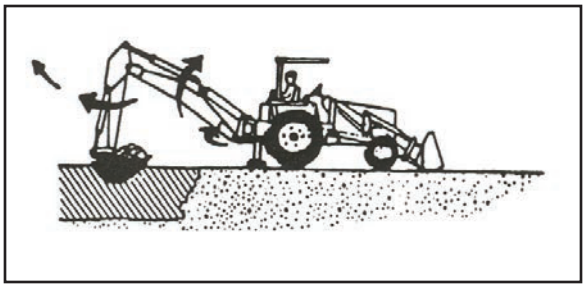


To obtain a cleaner trench and avoid the build up of material directly in front of the backhoe, crowd out and completely curl the bucket while starting to lift it from the excavation. In this way, excess material will fall back into the excavation.



DUMPING THE BUCKET

To dump the bucket at the end of the digging cycle, lift the bucket clear of the trench while crowding it out and swinging it to the spoil pile.

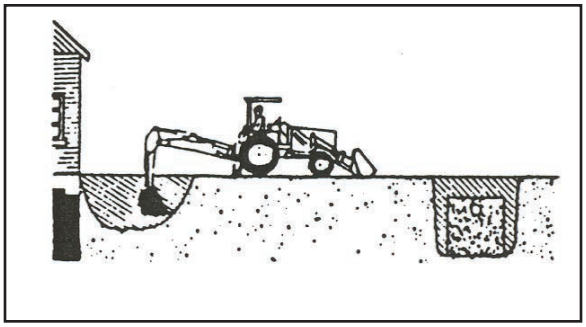


As the pile is approached, dump the bucket. When the bucket is empty, the dipperstick and bucket are in position to resume digging upon return to the trench.

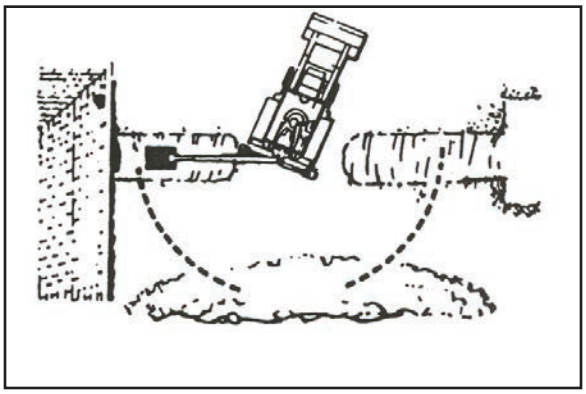
NOTICE: Avoid constant jarring or hammering-type contact between the spoil pile and the loaded bucket, as this may cause premature wear to the backhoe pins and bushings.

TRENCHING BETWEEN A BUILDING AND OPEN EXCAVATIONS

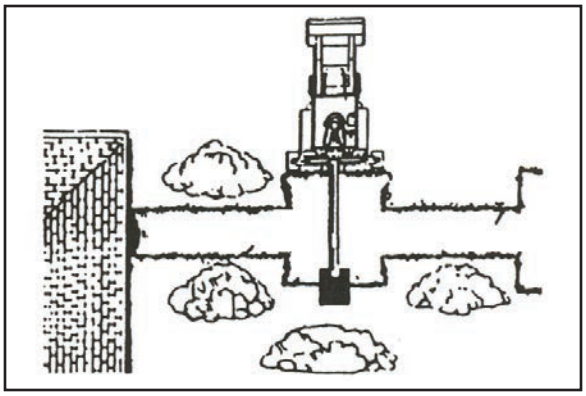
Start the trench at the building. Trench out halfway to the excavation. Then start trenching from the excavation to the first trench. Dig toward the first trench until there is just enough room to move the unit out between the two trenches.



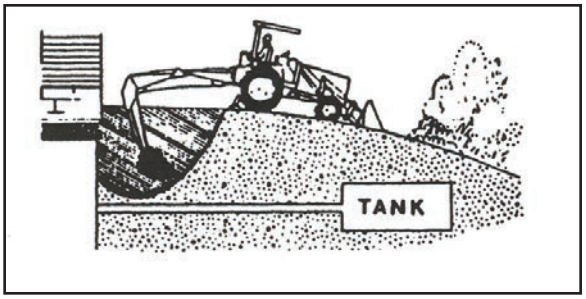
Position the unit so the backhoe swing post is over the centerline of the trench connection. Dig with the backhoe at extreme swing positions, and in as close to the stabilizers as possible. Pile the spoil on the opposite side of the trenches.



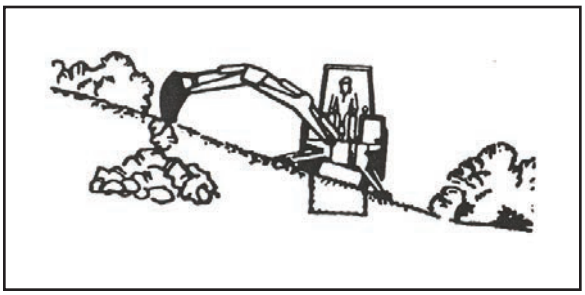
Position the unit forward with the lift and crowd levers so the two trenches can be connected. Pile the spoil on the opposite side of the trench.



SIDE SLOPE EXCAVATING OR TRENCHING
Dig with the backhoe uphill whenever possible.

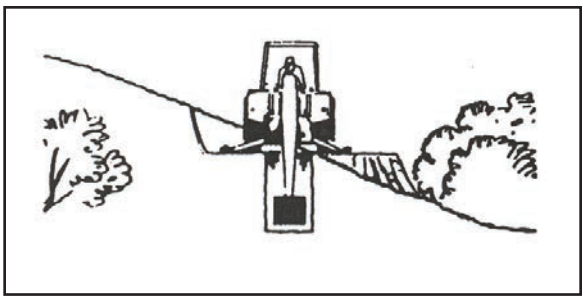


Level the backhoe on slopes with the stabilizers to dig plumb trenches, or use the backhoe or loader to cut a level slot for the uphill wheel and stabilizer. Pile the spoil from the slot on the low side.

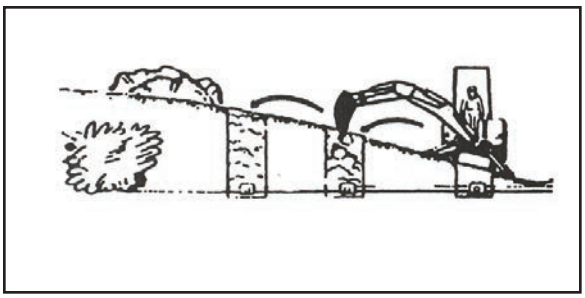


When on the side of a steep slope, cut a level surface along the uphill side of the trench with the loader.

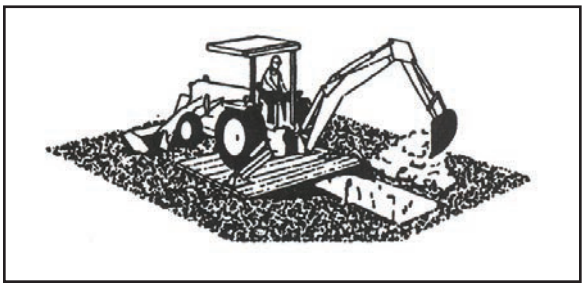
Pile the spoil of the cut downhill. When digging, pile the spoil of the trench uphill.



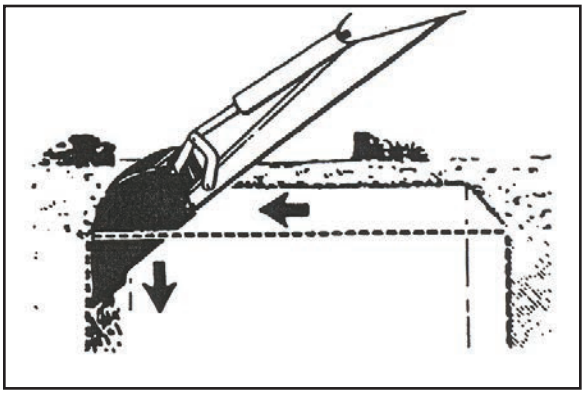
Dig field trenched progressively. As soon as one trench is completed, have the workmen lay the tile. Start the next trench, using the spoil to fill the previous trench.



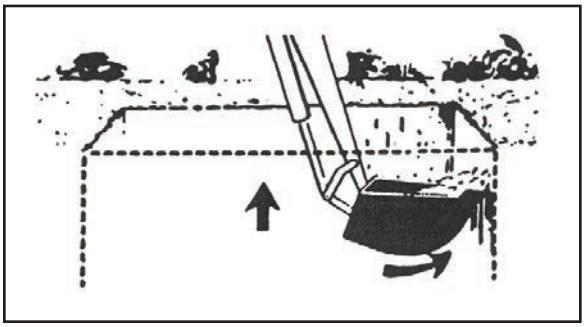
MISCELLANEOUS
When finishing straight walls or bellholes in sandy soil, use a platform under the rear tires and the stabilizers. The platform distributes the load over a larger area and lessons the possibility of a cave-in. The platform also tends to keep the unit from creeping rearward if hard digging is encountered.



FINISHING STRAIGHT WALLS
Finish the far wall by crowding out while forcing the bucket down from the boom. Actuate the bucket (curl out) to keep the bottom of the bucket vertical.



To finish the near wall, lift up and crowd in. Keep the edges of the bucket horizontal.



BACKFILLING
Backfill by lifting the bucket over the spoil pile and then crowding in. Pull both the crowd and lift levers for smooth, even backfilling.

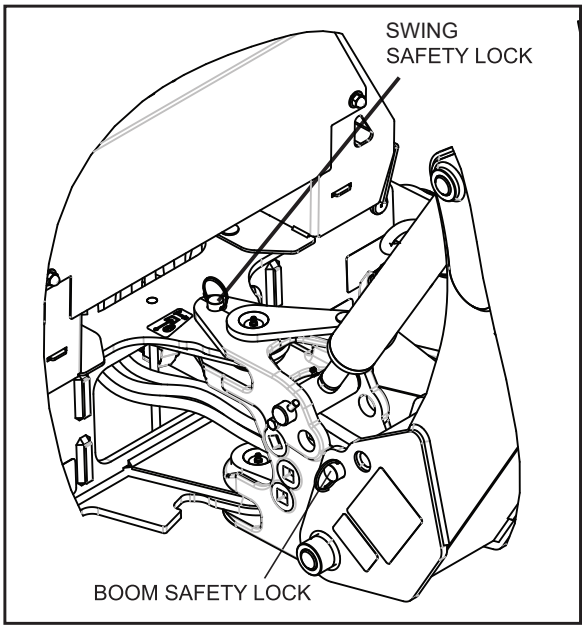
NOTICE: Do not backfill by using the swing circuit and dragging the bucket sideways. Doing so can cause damage to the dipperstick boom swing cylinders or mainframe.

BACKHOE SERVICE

CAUTION

To avoid possible injury, observe the following safety rules WHEN SERVICING the backhoe:

1. ENGAGE safety locks before servicing the backhoe.



2. DO NOT oil, grease or adjust the backhoe while it is in motion.

3. DO NOT change any backhoe relief valve settings. They are factory set for best performance and safety.

can have sufficient force to penetrate the skin and cause serious injury. Be sure to relieve all pressure before disconnecting lines. Be sure all connections are tight and that lines, pipes and hoses are not damaged before applying pressure to the system.

5. FLUID ESCAPING from a very small hole can be almost invisible. Use a small piece of cardboard or wood – not your hands – to search for suspected leaks.

6. SEE A DOCTOR AT ONCE if injured by escaping fluid. Serious infection or gangrene can develop if proper medical treatment is not administered immediately.

7. PROTECT YOUR EYES – Wear safety glasses. Guard against injury when driving connecting pins or performing any repair in which particles can chip from work piece or striking tool

BEGINNING OF SEASON

- Remove all protective covering.
- Check hydraulic hoses for deterioration and replace, if necessary.
- Lubricate all grease fittings and oil handle linkage.
- Check hydraulic system for loss of fluid and, if necessary, fill to proper level.
- Tighten all loose bolts, nuts, and setscrews.
- Inspect and service bucket teeth as required.
- Operate the backhoe slowly for a short time before placing the unit under full load.

HYDRAULIC SYSTEM

Bleeding Backhoe Hydraulic System

If the hydraulic hoses have been disconnected from the backhoe or tractor, all trapped air must be removed after the hoses are connected. Start tractor engine and operate backhoe through all movements fully, several times, to purge the system of air.

Hydraulic System Hoses

Oil leaks in the pressure side of the system can be located by carefully inspecting the external area of the hoses and fittings.

When tightening connections, always use two wrenches.

NOTICE: Do not over-tighten fittings. Make them just tight enough to eliminate leaks.

NEVER use Teflon tape on pipe thread fittings. Always use a paste-type sealer.

Hoses on any backhoe are very severely worked and will fail in time. Examine them regularly and replace any that show signs of failure. Pay careful attention to the routing of hoses so they can move fully and freely without kinking, and cannot be pinched or cut by any part of the backhoe.

When disconnecting hydraulic hoses for service, always identify hose end and corresponding hydraulic fitting by labeling components. Refer to service parts section diagram for hydraulic hoses and fittings for labeling suggestions. Control valve function identification is from left to right when seated on backhoe (1 thru 6). Upper ports on control valve are identified as “A” and lower ports as “B”. For example; “1A” label would correspond to the Swing Circuit and the hose connecting to the rod side of the cylinder.

Hydraulic System

If the tractor system supplies the hydraulic power, service according to the tractor instruction manual.

BUCKET TOOTH POINTS
The bucket tooth points are self-sharpening and will require little attention; however, these can be replaced when they become badly worn or broken.

A tooth can be replaced by unbolting it from the bucket cutting edge. Install new tooth using new hardware.

TIGHTENING NUTS AND BOLTS
Periodically check to be sure all bolts and nuts are tight. See torque chart at back of manual.

Check all pivot pins for cotter pins, washers, and retainers; if missing, replace.

LUBRICATION
Economical and efficient operation of the backhoe is dependent upon regular and proper lubrication of all moving parts with a quality lubricant.

All parts provided with grease fittings should be lubricated with a good quality chassis lube type grease. If any grease fittings are missing, replace them immediately. Clean all fittings thoroughly before using grease gun.

Lubricate all grease fittings at least twice daily, once at the beginning of operation and again approximately halfway through the work day.

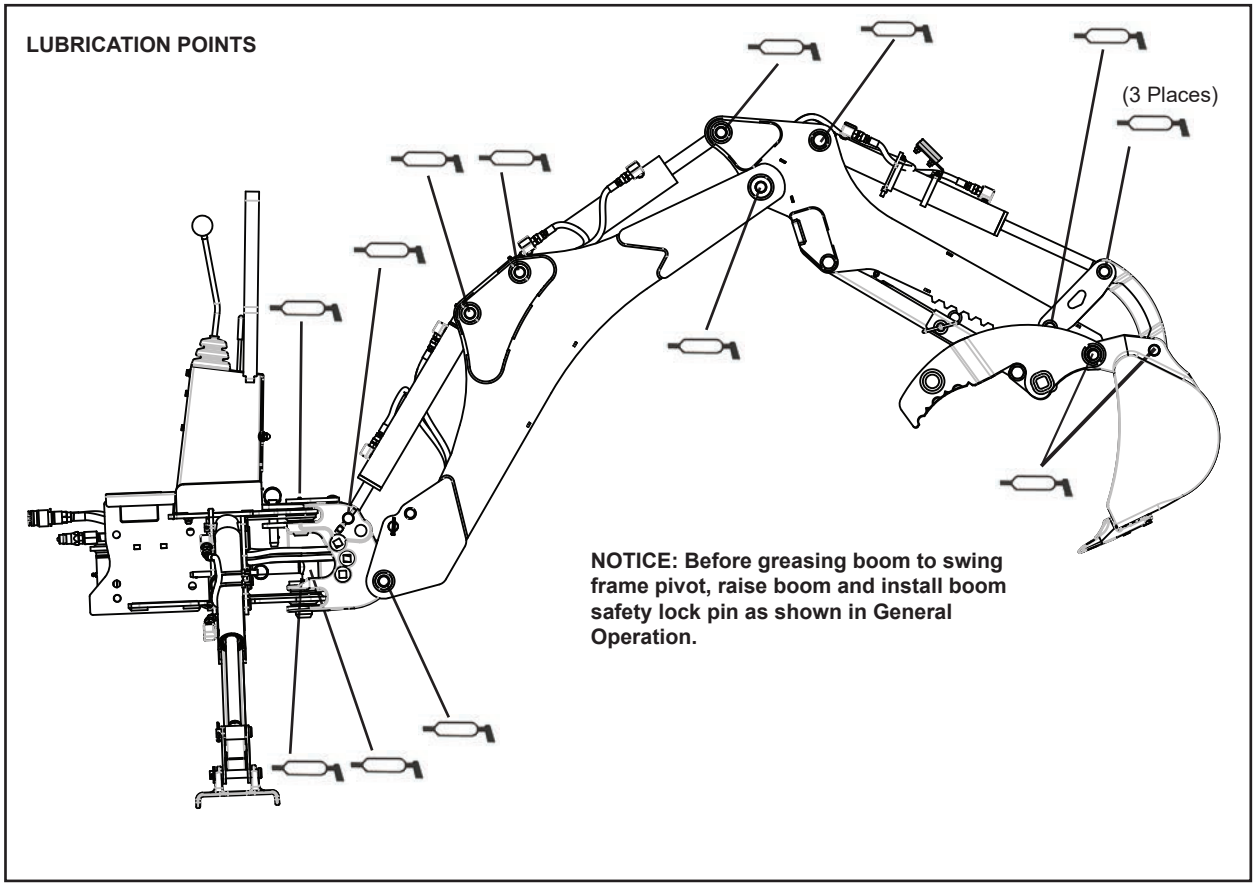
Lower stabilizers to the ground, extend dipperstick and bucket and lower boom so bucket rests on the ground as shown. Refer to these illustrations for the location of all grease fittings.

NOTICE: Before greasing boom to swing frame pivot, raise boom and install boom safety lock pin as shown in General Operation.

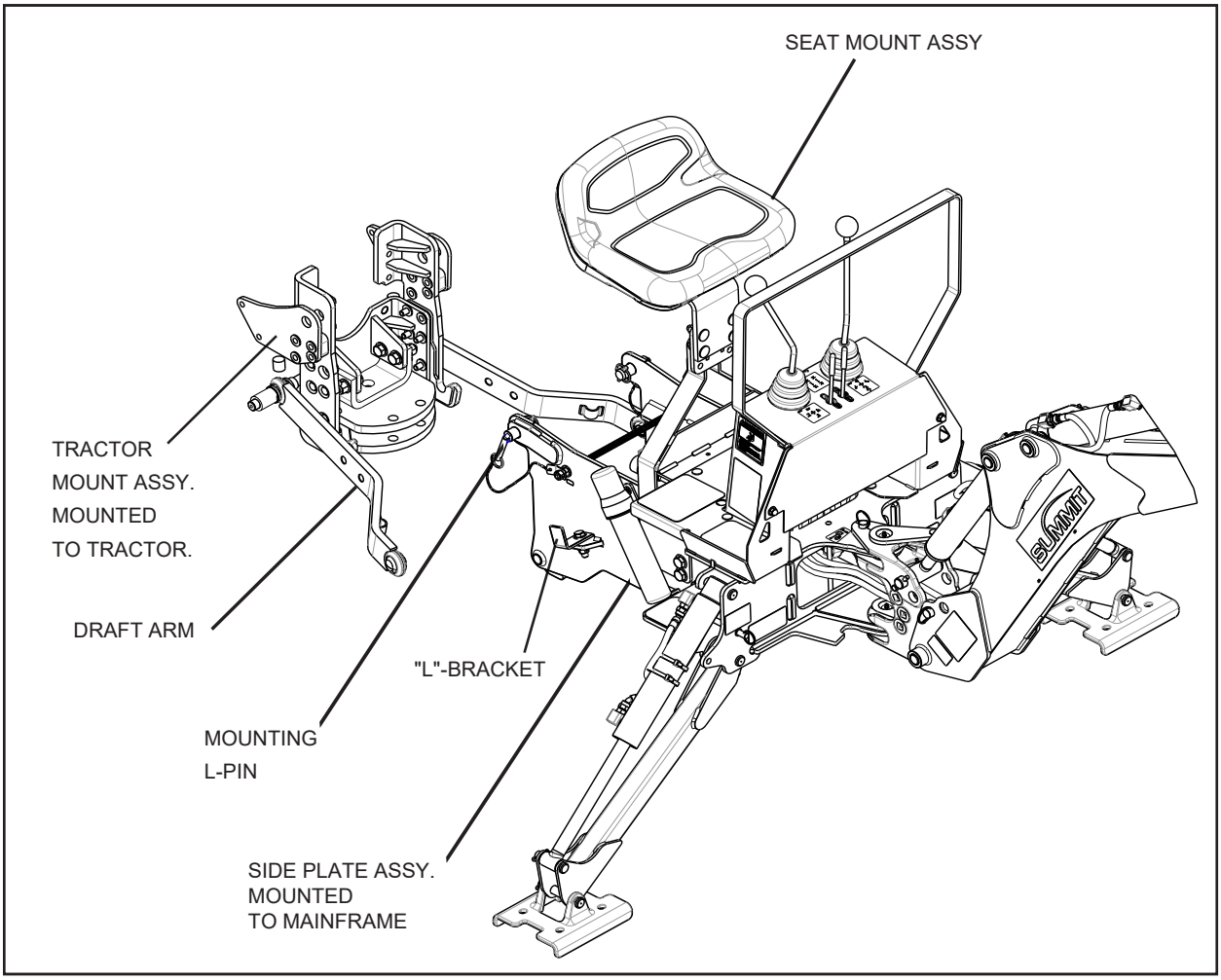
The following locations should be oiled with SAE30 oil:

A. Stabilizer Pivot Pins
B. Control Handle Linkage
C. Seat Bracket Pivot

NOTICE: Avoid excessive greasing. Dirt collects on exposed grease and increases wear greatly. After greasing, wipe off excessive grease from fittings.



INSTALLING BACKHOE TO TRACTOR



Note: When installed,Lower pins in backhoe frame will rest in hooks of tractor mounts. Top holes in backhoe frame will align with holes in tractor mounts.

1. Park tractor safely and assure that 3-point is raised.

2. Remove tractor 3-point center link and lift links. Draft arms Remain on tractor.

3. Remove Swinging Drawbar.

4. Back tractor up until approximately 6” from backhoe, and spread draft arms so they are outside of backhoe mainframe plates.

5. Disconnect pressure and power beyond hoses at quick coupler. Connect pressure, power beyond and tank line hoses of backhoe to appropriate lines coming off of Tractor.

NOTICE: Avoid damage! Be careful not to disconnect or damage hydraulic hoses when moving tractor.

6. **Use backhoe boom and stabilizer control levers to raise backhoe mainframe evenly and level to ground. Make sure to raise backhoe to clear the tractor draft arms, approximately 16”**

7. Reposition tractor under pins in backhoe.

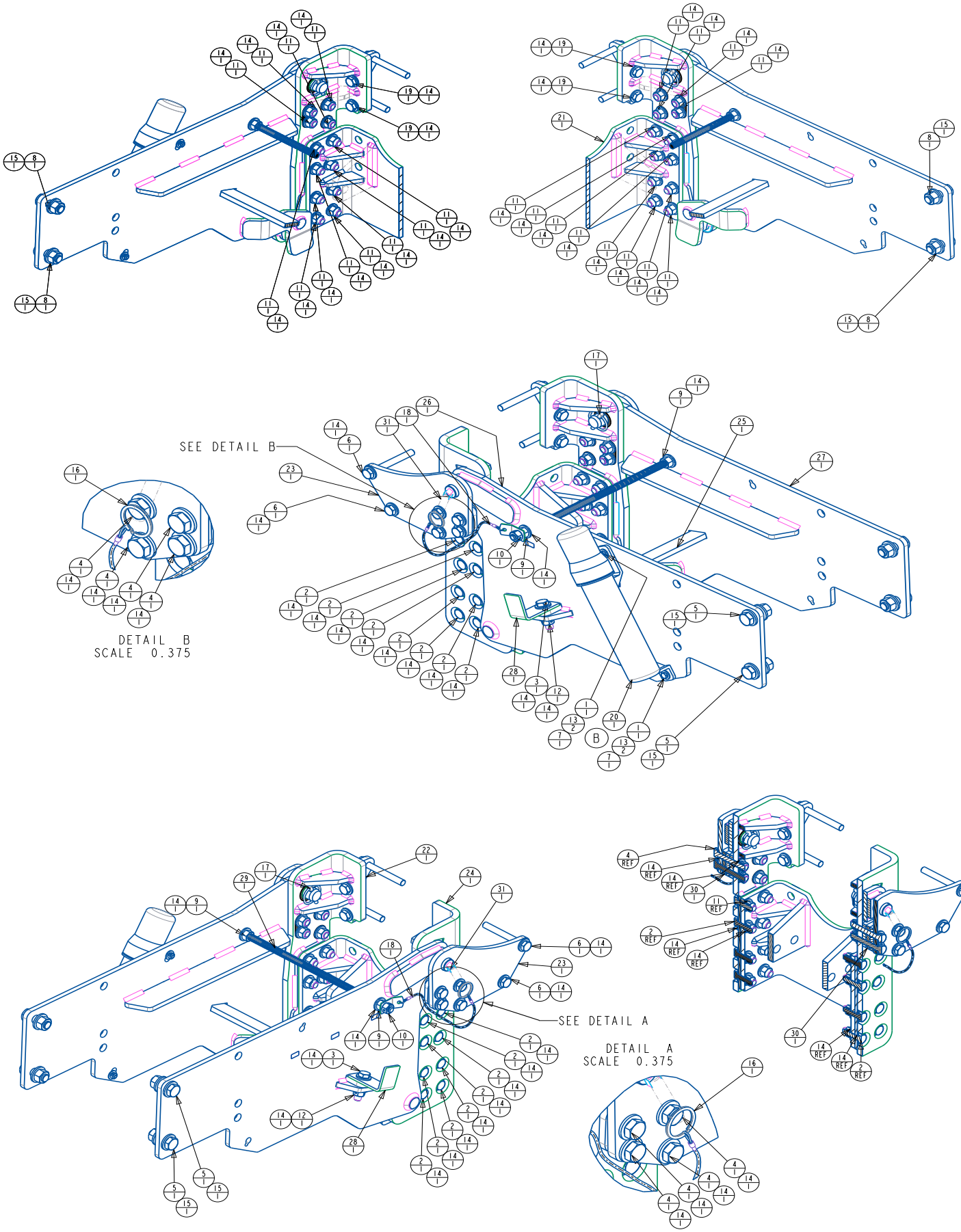
8. Use stabilizer control levers to raise or lower stabilizer legs as needed to position pins in backhoe frame above hooks in tractor mounts.

9. Use stabilizer control levers to lower stabilizer legs until pins rest in hooks in tractor mounts. Check to be sure hydraulic hoses are routed away from pinch points.

10. Use boom control lever to rotate backhoe towards tractor to align top holes, and install L-pins. Secure L-pins with lynch pins.

11. Place draft arms in L-brackets for storage when Backhoe is on tractor.

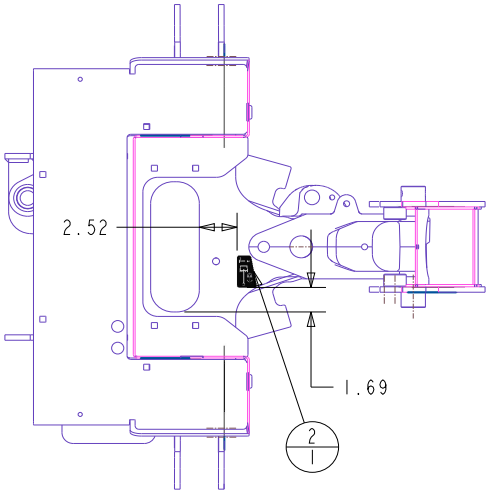
ASSY, MOUNT KIT- S0B1674



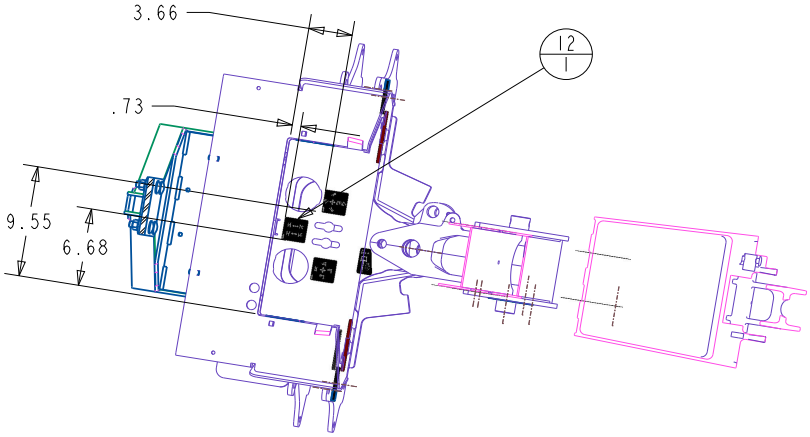
(SEE PAGE 19B PARTS LIST)

S0B1674 MOUNT ASSY - PARTS BREAKDOWN			
INDEX	QTY	PART NUMBER	DESCRIPTION
1	2		HHCS 1/4-20 UNC 1.00",GR5
2	16		HHCS 1/2-20-UNF 1-1/2"L,GR8
3	2		HHCS 1/2-20-UNF 2.0"L,GR5
4	8		HHCS 1/2-20-UNF 2-3/4"L,GR8
5	4		HHCS 5/8-18 UNF 1-3/4"L,GR5
6	4	007384	HHCS M12-1.75, 100,GR8.8
7	2		NUT,LOCK,MID 1/4-20 UNC,GR 2
8	4		NUT,HEX 5/8-18 UNF,GR5
9	4		NUT,HEX 1/2-13 UNC,GR5
10	2		NUT,LOCK,MID 1/2-13 UNC,GR 2
11	24		NUT,HEX 1/2-20 UNF,GR5
12	2		NUT,LOCK,MID 1/2-20 UNF,GR 2
13	4		WASHER, USS, LC 1/4"ID NOM
14	64	008164	WASHER,SAE,HRD 1/2"ID NOM
15	8	008178	WASHER,SAE,HRD 5/8"ID NOM
16	2		RING,SPLT KEY 1.159ID(1-1/4")x.1.380D
17	2	013491	PIN, LYNCH 1/4" x 1-9/16"
18	2	014172	CABLE, ASSEMBLY
19	4	018653	HHCS M12-1.75, 30,GR10.9
20	1	066208	TUBE, OWNERS MANUAL
21	1	847640	WELDMENT,MOUNT BASE
22	1	847645	WELDMENT, RH REAR MOUNT
23	2	847649	PLATE,UPPER MNT RR MNT
24	1	847650	WELDMENT, LH REAR MOUNT
25	1	847653	PLATE, CROSS SUPT
26	1	847655	WELDMENT,RH SIDE MOUNT
27	1	847660	WELDMENT,LH SIDE MOUNT
28	2	847664	BRACKET,ARM SUPT
29	1	847666	ROD,THRD-1/2-13 UNC MNT SUPT
30	2	847670	WELDMT,UPPER SPACER (SUMMIT)
31	2	849110	WELDMT, PIN BACKHOE HANDLE

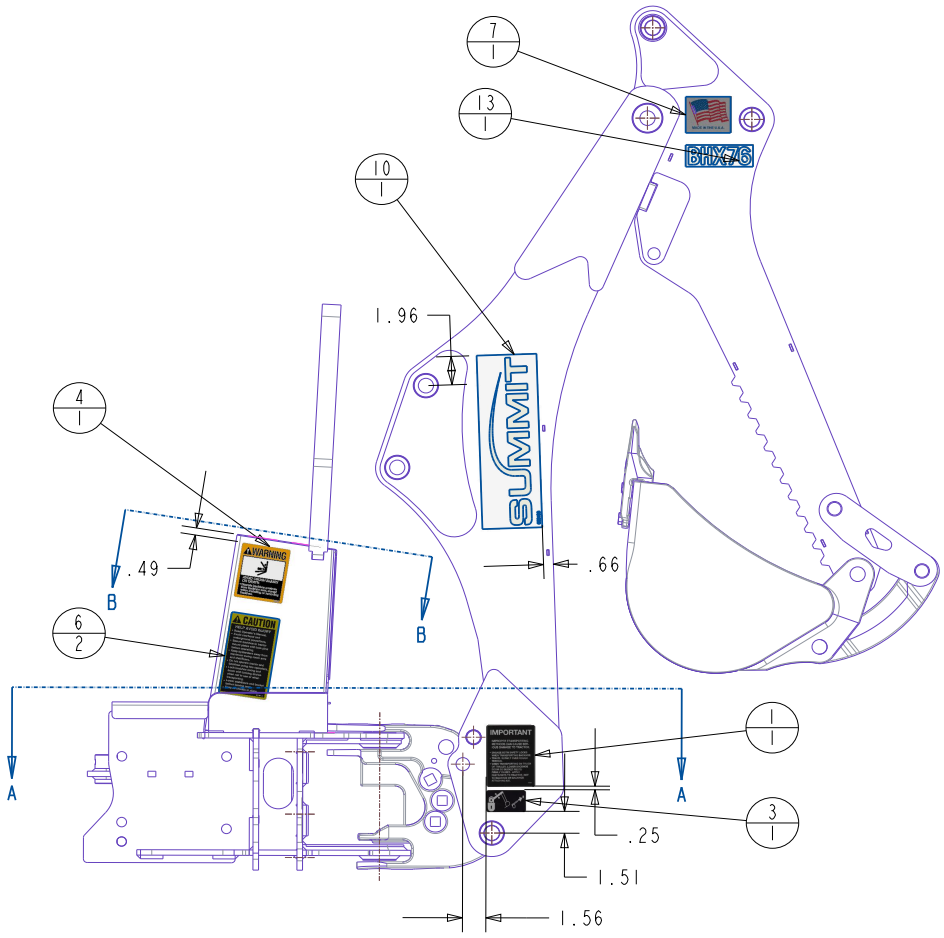
ASSY, DECAL PLACEMENT- SMB1673



SECTION A-A

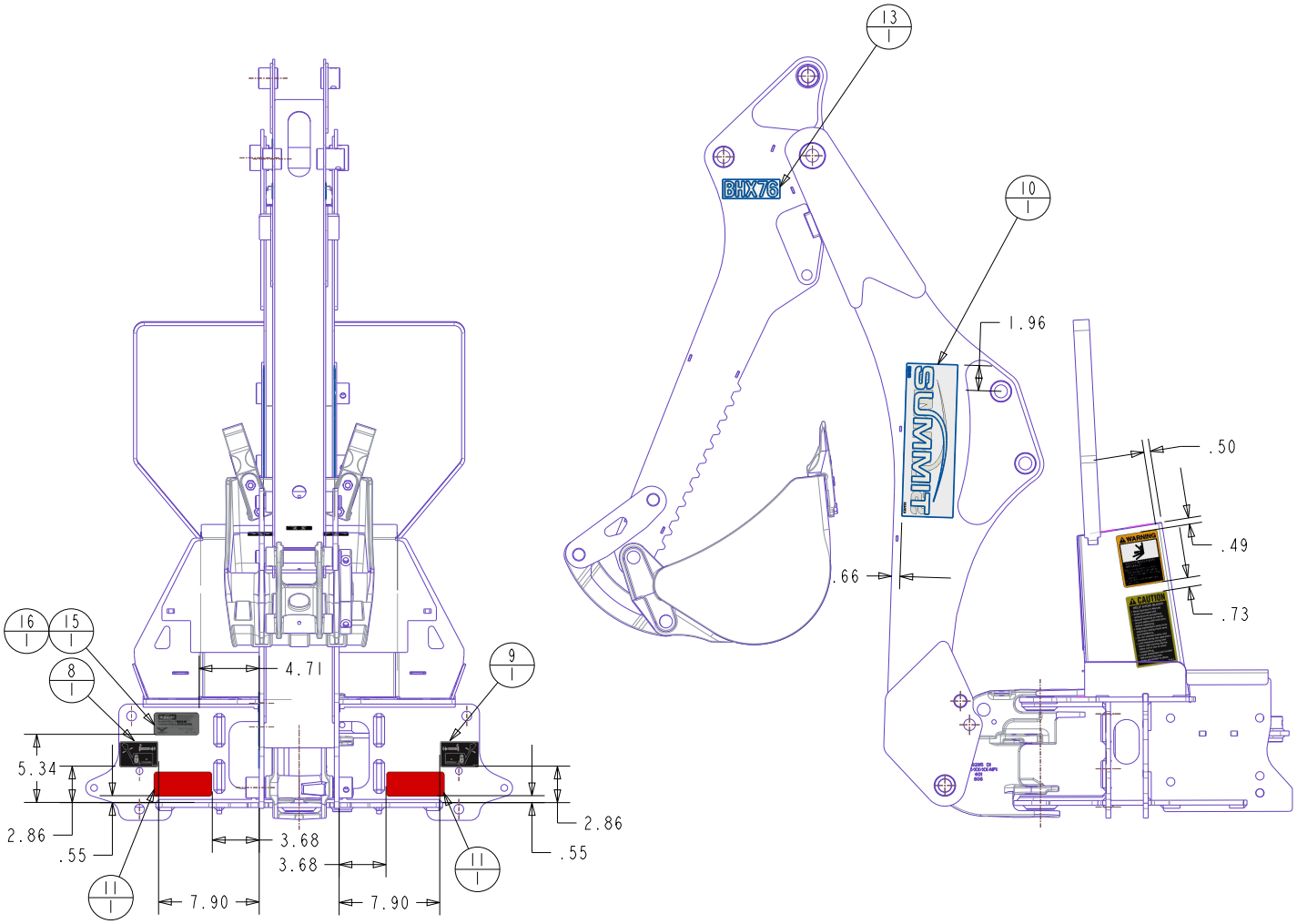


SECTION B-B
SCALE 0.100



(SEE PAGE 19E PARTS LIST)

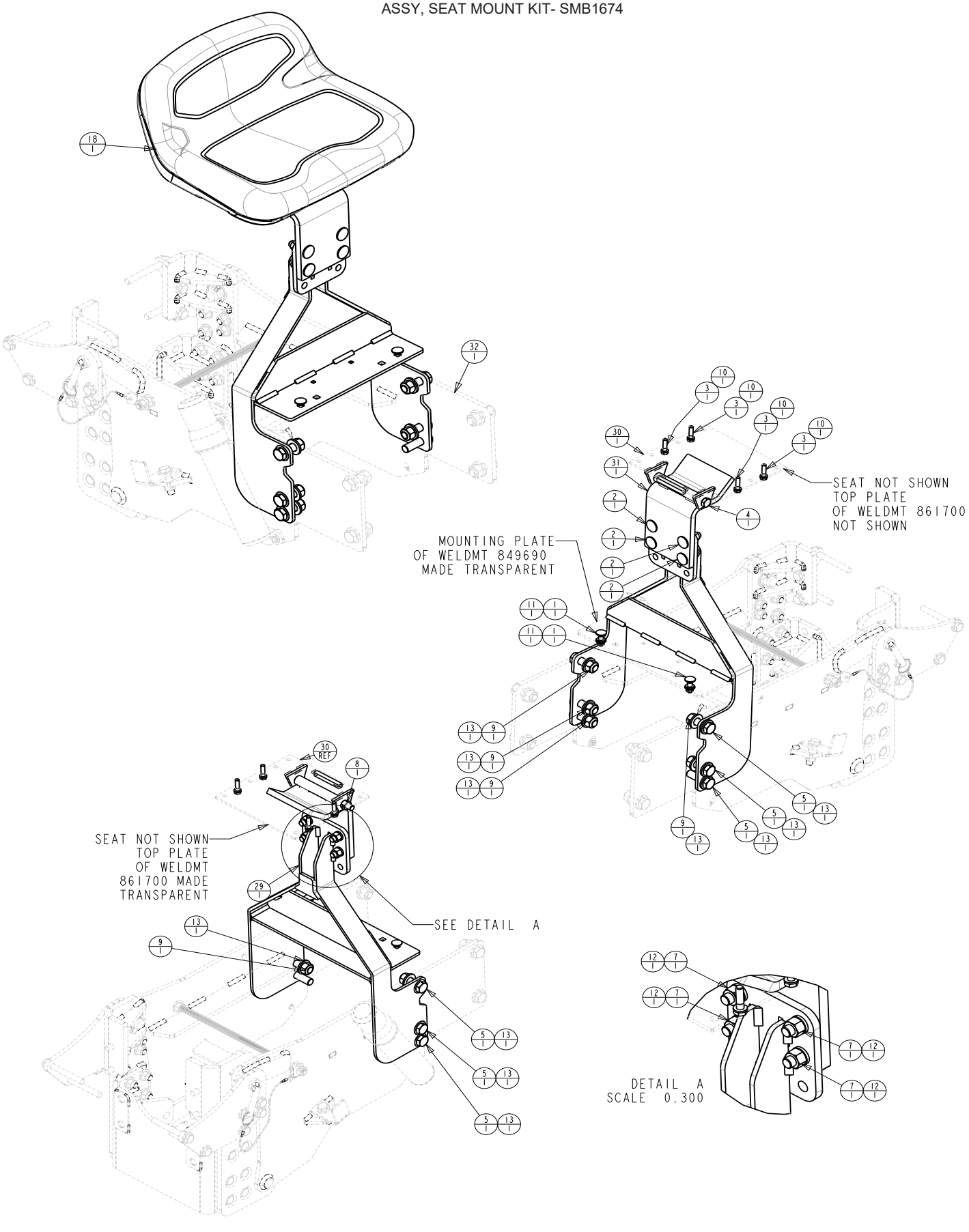
ASSY, DECAL PLACEMENT- SMB1673-CONTINUED



(SEE PAGE 19E PARTS LIST)

SMB1673 DECAL PLACEMENT - PARTS BREAKDOWN			
INDEX	QTY	PART NUMBER	DESCRIPTION
1	1	010099	DECAL-IMPORTANT
2	1	020050	DECAL-SWING LOCK
3	1	020051	DECAL-SWING LOCK
4	1	020138	DECAL, WARNING
5	1	020170	DECAL, WARNING
6	2	020198	DECAL-CAUTION
7	1	020368	DECAL-USA
8	1	020425	DECAL,STAB LOCK
9	1	020426	DECAL,STAB LOCK
10	2	020435	DECAL, SUMMIT LARGE
11	2	020437	DECAL,REFLECTOR
12	1	020440	DECAL-CONTROL (3 PC)
13	2	020441	DECAL,SUMMIT BHX76
14			
15	1	847641	DECAL,SERIAL BHX76 (SUMMIT)
16	1	M74729	DECAL, COVER (LAMINATE)
17			
18			
19			
20			

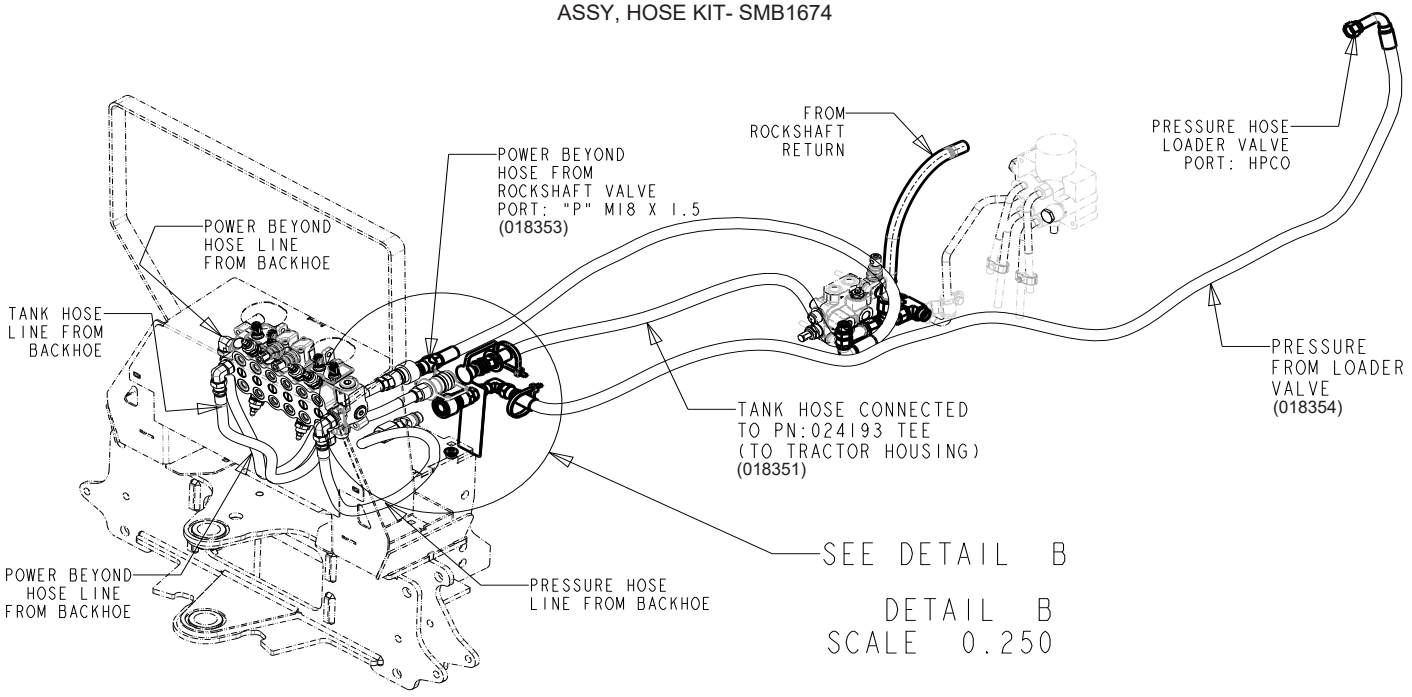
ASSY, SEAT MOUNT KIT- SMB1674



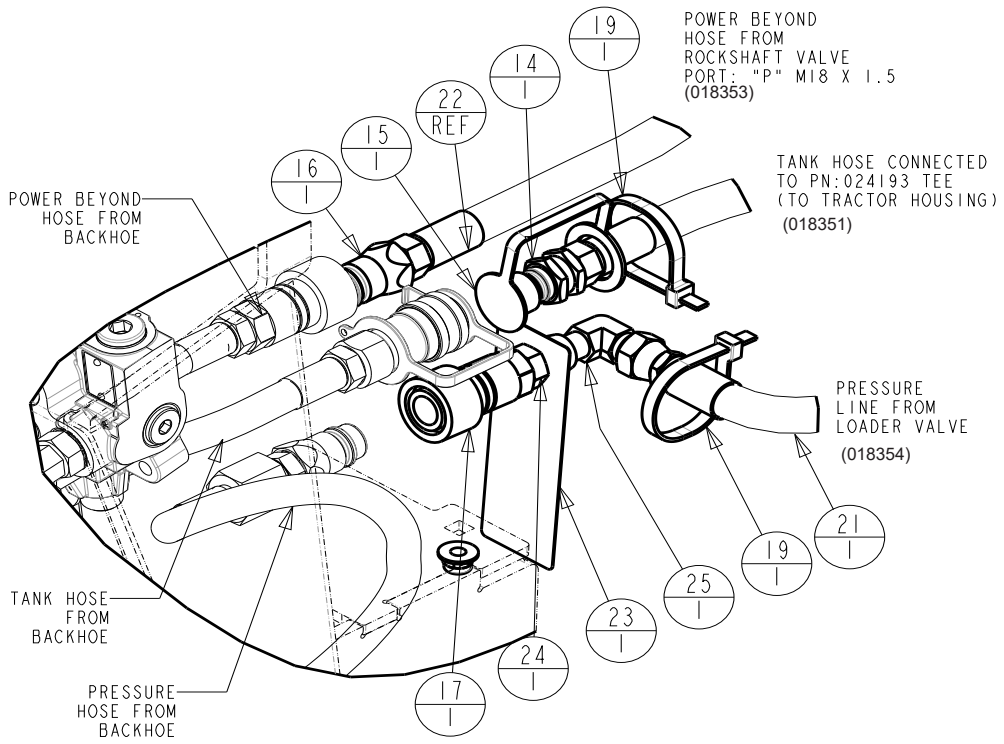
(SEE PAGE 19G PARTS LIST)

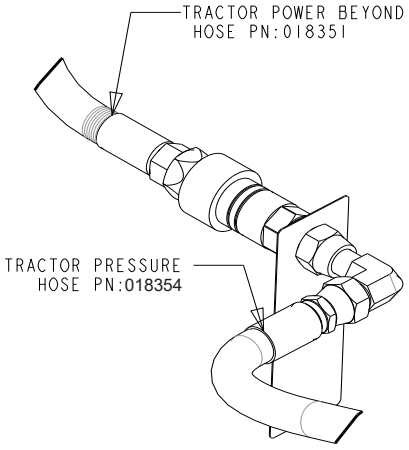
SMB1674 SEAT ASSY - PARTS BREAKDOWN			
INDEX	QTY	PART NUMBER	DESCRIPTION
1	2		BOLT,CARR.-3/8"-16 UNC 1-1/4"L,GR5
2	4		BOLT, CARR.-1/2"-13 UNC 1-3/4"L,GR5
3	4		HHCS 5/16-18 UNC 1-1/4"L,GR5
4	1		HHCS 1/2-20-UNF 6-1/2"L,GR5
5	6		HHCS 5/8-18 UNF 2-0"L,GR5
6	2		NUT,HEX,LK FLG (NYLON) 3/8-16 UNC
7	4		NUT,HEX 1/2-13 UNC,GR2
8	1		NUT,LOCK,MID 1/2-20 UNF,GR 2
9	5		NUT,HEX,TORQUE PATCH 5/8-18 UNF,GR5
10	4		WASHER, SPLIT LOCK 5/16" NOM
11	2		WASHER, SPLIT LOCK 3/8" NOM
12	4		WASHER, SPLIT LOCK 1/2" NOM
13	11	008178	WASHER,SAE,HRD 5/8"ID NOM
14			
15			
16			
17			
18	1	013837	SEAT
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29	1	849690	WELDMENT,SEAT MOUNT
30	1	861700	WELDMENT-SEAT PLATE
31	1	868345	WELDMT, SEAT PIVOT
32			

ASSY, HOSE KIT- SMB1674



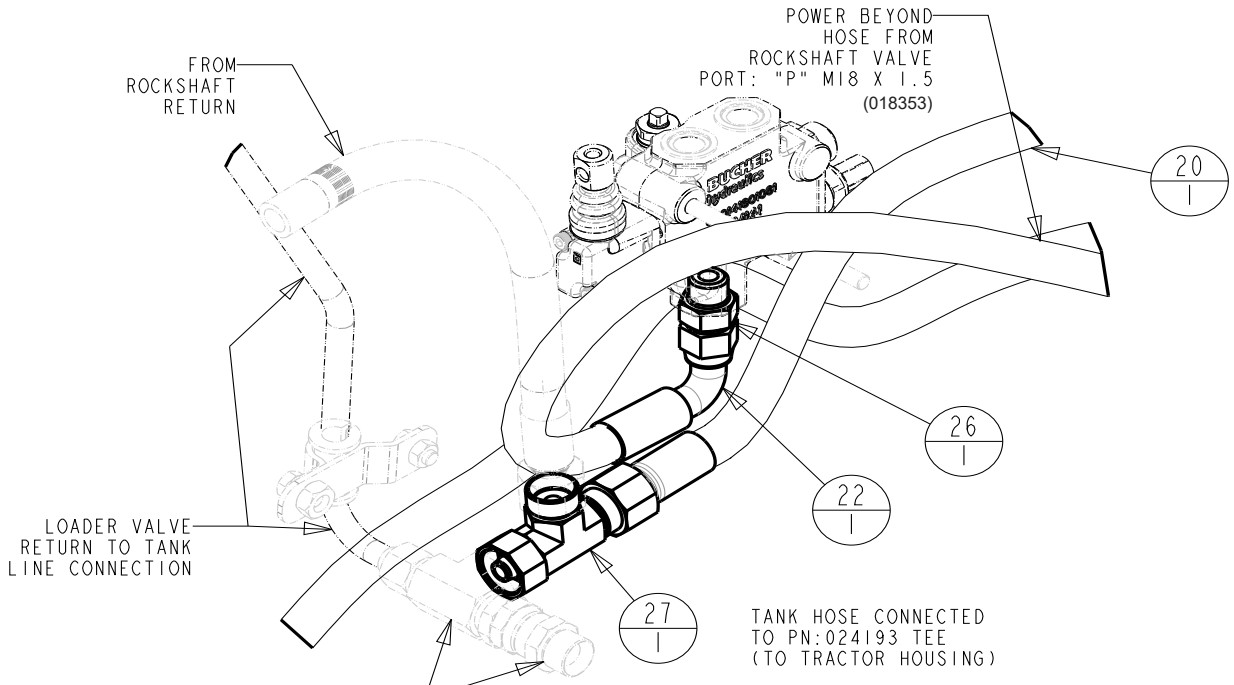
REAR VIEW OF TRACTOR
TRACTOR MODEL NOT SHOWN IN VIEW
FOR HOSE ROUTING CLARITY



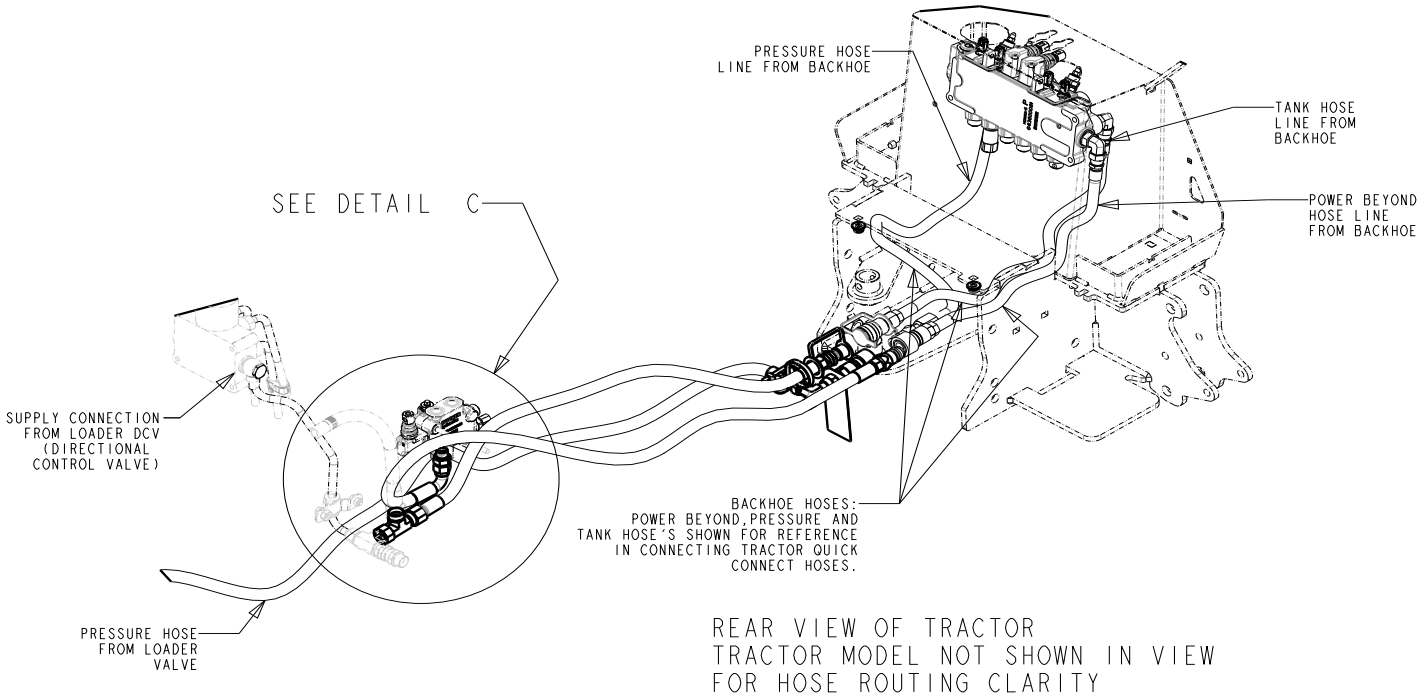


CONNECT TRACTOR PRESSURE & POWER BEYOND HOSES TOGETHER WHEN BACKHOE IS DISCONNECTED

(SEE PAGE 20 PARTS LIST)



DETAIL C
SCALE 0.250



REAR VIEW OF TRACTOR
TRACTOR MODEL NOT SHOWN IN VIEW
FOR HOSE ROUTING CLARITY

(SEE PAGE 20 PARTS LIST)

SMB1674 HOSE KIT - PARTS BREAKDOWN			
INDEX	QTY	PART NUMBER	DESCRIPTION
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14	1	011275	COUPLER NOSE
15	1	011285	CAP,DUST HYDR. -6 (3/8")-BLACK
16	1	011298	COUPLER, NOSE
17	1	011304	COUPLER, BODY (PARKER 4050-15P)
18			
19	2		TIE, CABLE, POLY. 11.75 LG
20	1	018351	ASSY, HOSE, HYDRAULIC #8 HOSE, 8-8
21	1	018354	ASSY,HOSE,HYDRAULIC #8 HOSE, 8-8
22	1	018353	ASSY, HOSE, HYDRAULIC #8 HOSE, 8-8
23	1	020035	PLASTIC TAG-CAUTION
24	1	024033	FITTING, MORFS x MORB 8-8
25	1	024036	FITTING,ELB,90 MORFS/ORFS SW, 8-8
26	1	024189	FITTING,MORFSxMORB(ISO) 8-M18
27	1	024193	TEE,RUN,ADJ,BSPP 16-16-16
28			
29			
30			
31			
32			

REMOVING AND STORING BACKHOE

CAUTION

Avoid injury! Keep people away from tractor while removing backhoe. Run engine just above slow idle to keep tractor movements slow and controllable.

NOTICE: Select a hard, level surface to remove and store backhoe.

1. Park tractor safely.

2. Start engine and run at slow idle.

3. Lower stabilizers to the ground.

4. Center boom and install swing lock pin if not installed.

5. Remove boom locking pin if installed.

6. Extend dipperstick and lower boom.

7. Rotate bucket until cutting edge is parallel with ground.

8. Use boom control lever to lower and place slight down pressure on backhoe.

9. Stop engine.

10. Remove L-pins from backhoe mounts.

11. Start engine and run at slow idle.

12. Use backhoe controls to disengage backhoe from tractor.
- Use boom control lever to rotate backhoe rearward slightly.
- Use stabilizer control levers to raise pins in backhoe mainframe above hooks in tractor mounts. Drive tractor ahead slowly until pins clear tractor lower draft arms.
- Lower backhoe until mainframe is resting on ground. Make sure hydraulic hoses are not pinched or stretched.

WARNING

Avoid injury! Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve hydraulic system pressure by moving hydraulic controls in all directions before connecting or disconnecting hydraulic lines.

13. Lock tractor park brake.

14. Stop engine.

15. Cycle boom control lever to relieve backhoe system pressure.

CAUTION

Avoid injury! Before removing hydraulic hoses, be sure boom lock pin and swing lock pin have been installed. Cycle boom control lever to relieve backhoe system pressure before attempting to remove quick disconnect couplers.

16. Disconnect backhoe hoses from tractor rear remote hydraulics.

17. Connect hoses together and store hoses out of way on backhoe.

18. Reconnect pressure and power beyond hoses on tractor which are located above PTO shield.

19. Disconnect tractor lower draft arms from arm retainer on tractor drawbar. Remove arm retainer from drawbar and store with backhoe.

20. Reinstall tractor 3-point hitch components to tractor.

NOTICE: Failure to reconnect hoses will damage tractor hydraulic system.

VALVE REPAIR – DISASSEMBLY

Replacing Spools Seals:

Note: For the purpose of these instructions we will consider the control handle side of the valve as the FRONT, and the opposite side as the BACK.

1. Remove control valve from the backhoe.

2. Thoroughly clean the exterior of the valve before beginning disassembly procedures.

3. At the BACK of the valve remove all bonnet assembly parts which are connected to the spool. Keep parts in the order of disassembly. See each valve section parts breakdown for the parts involved in the make-up of the bonnet assembly.

NOTICE: DO NOT remove the spool from the valve. The seals can be replaced externally. Prevent spools from turning or moving by inserting a screw driver through the clevis slot, or by running a rod through the pin hole and using the rod as a handle.

DO NOT hold the spool with a wrench. This will destroy the finish.

4. At the BACK of the valve, remove seal retainer, back-up washer, and spool O-ring seal, or retaining sleeve, bonnet O-ring seal and spool O-ring.

5. Thoroughly clean counter bores.

6. Install new seals:

A. Spring-Centered Bonnet Assembly Only:

Lightly oil new O-ring seal. Slide O-ring seal over valve spool and insert in seal counter bore. Replace back-up washer and seal retainer.

B. Float Bonnet Assembly Only:

Lightly oil new O-rings. Install O-rings into spacer. Slide spacer with O-rings over valve spool being careful to orient as shown in boom valve section breakdown.

7. At the BACK of the valve replace bonnet assembly parts, reversing the order in which they were disassembled in step 3. Use 6-8 ft. lbs. Torque to tighten assembly screw on spring centered bonnet assembly.

8. At the FRONT of the valve remove all parts connected to the spool (handle, linkage, etc.).

9. At the FRONT of the valve remove seal plate retainer, back-up washer and spool O-ring seal.

10. Thoroughly clean counter bore.

11. Lightly oil new O-ring seal. Slide O-ring seal over valve spool and insert in seal counter bore. Replace back-up washer, and seal plate retainer.

12. Reattach all parts connected to the spool (handle, linkage, etc.).

HYDRAULIC TROUBLE SHOOTING

The trouble shooting material presented in this section is offered as a guide to diagnosing probable causes and remedies for general operational problems. Match your problem with the typical problem examples given, and note the numbers given for the possible cause. These numbers correspond with the possible cause and correction paragraphs that follow.

NOTICE: When using the following chart, if it is decided that an overhaul of components or pressure adjustments are necessary to correct malfunctioning, it is recommended that your dealer make these repairs. His is equipped to do this work.

WARNING - Escaping hydraulic/diesel fluid under pressure can penetrate the skin causing serious injury.
Do not use your hand to check for leaks. Use a piece of cardboard or paper to check for leaks. Stop engine and relieve pressure before connecting or disconnecting lines. Tighten all connections before starting engine or pressurizing lines. If any liquid is injected into the skin, obtain medical attention immediately or gangrene may result.

Problems and Possible Causes

A. Machine fails to operate when started initially – 1, 2, 5, 7, 16, 24

B. Machine loses power after operating satisfactorily initially – 1, 8, 10, 14, 16, 24

C. Loss of power in lift or crowd cylinder, but other cylinders function properly – 23, 25, 30

D. Loss of power in any one cylinder including lift and crowd – 8, 9, 10, 11, 12, 13, 23, 25, 26

E. Loss of power in swing cylinders, but other cylinders functioning properly – 8, 9, 10, 11, 12, 13, 23, 24, 26

F. Maximum swing action cannot be obtained – 12, 15

G. Slow operation of machine (lack of power) all cylinders – 1, 4, 6, 14, 16, 24

H. Spongy or jerking action of cylinders and/or noisy operation - 1, 3, 4, 5

I. Lift, crowd or bucket cylinders drop under load when control spools shifted from neutral – 28, 30

J. Load drops or settles – 8, 10, 13, 26, 28

K. Leaky cylinders – 10, 11, 12, 13

L. Leaky valve – 8, 16, 17, 29

M. Sticky valve spool – 17, 20, 21, 22

N. Unable to push valve spool in – 17, 18, 20, 21, 22

O. Spring centered spools do not return to neutral – 17, 18, 19, 20, 21, 22

Causes and Corrections

1. Low oil supply in reservoir – fill to proper level.

2. No oil supply to machine – oil is not being diverted from the prime mover hydraulic system. Be sure that the proper controls are actuated on the prime mover.

3. Air in system – bleed all circuits of air by operating machine at maximum oil flow and through full movements.'

4. Oil viscosity too heavy, or oil is not at operating temperature – use recommended hydraulic fluid. Run machine until oil reaches operating temperature.

5. Pump not running – check pump drive to be sure it is engaged.

6. Insufficient pumping – advance engine throttle.

7. Improper hose connection – **NOTICE: Be sure inlet and return hoses are hooked up correctly. Improper hook-up will result in damage to the backhoe valve.**

8. Loose oil line connections, leaks in line or broken lines – tighten all hose connections and replace any damaged O-rings at leaking O-ring fittings. Check and replace any damaged hoses and lines.

9. Restrictions in oil lines – check and replace any damaged hoses and lines. Check for pinched hoses.

10. Oil is bypassing cylinder piston, scored piston, worn piston packing, or defective piston assembly – replace or rebuild the cylinder; replace damaged parts.

11. Scored piston rods and worn rod guides in cylinder – replace or rebuild the cylinder; replace damaged parts.

12. Bent piston rod in cylinder – replace or rebuild the cylinder; replace damaged parts.

13. Worn or damaged rod seals on cylinder; external leaks – repack cylinder. Rebuild cylinder, replacing damaged parts as necessary.

14. Diverter valve on prime mover leaking externally or bypassing oil internally through valve to reservoir – diverter valve may need rebuilding or replacing.

15. Something jamming the swing linkage – remove interference.

16. Excessive back pressure – relieve condition. May be restriction from outlet to reservoir.

17. Paint on valve spool; sticking valve spool or scored valve spool – clean valve spool. Binding is usually caused from an over tightened plug, mounting bolt, fitting in valve body. If a plug or fitting in the valve body is leaking, do not over tighten in an effort to stop leak. This will distort body casting and cause spools to bind. Instead, the plug and fitting should be removed from valve body and be reconnected, using a new O-ring. Do not apply excessive pressure on mounting bolts. Never force spool, if binding occurs see item 30 at the end.

18. Oil leakage past spool seal into spool cap – remove cap. If it contains oil replace spool seal O-rings. Check O-ring retainer to be sure it is flat. If it has been “belled” check for restriction from outlet to reservoir of valve which would cause excessive back pressure. See item 30 at the end.

19. Broken return springs – replace springs, see item 30 at the end.

20. Bent spool – replace with new spool section. See item 30 at the end.

21. Foreign particles – clean system and valve.

22. Misalignment of control handle linkage – check linkage for binding condition.

23. Spool not moved to full stroke – check travel, should be 5/32” either way, or a total of 5/16”. See item 30 at the end.

24. Relief valve setting in backhoe control valve too low or defective – relief pressure will have to be checked and corrections made. Backhoe system pressure is 2100 psi. Relief valve may need cleaning and overhauling, or entire cartridge must be replaced. See item 30 at the end.

25. Overload relief valve in the control valve stuck open or malfunctioning – clean relief as it cannot be field calibrated, or replace cartridge. See item 30 at the end.

26. Worn control valve – replace the control valve.

27. Check poppet in the control valve not holding – clean check poppet(s) carefully, being sure that it moves freely with good spring action and seats properly or replace. See item 30 at the end.

28. Damaged or worn spool seals – replace spool end seals, see item 30 at the end.

29. Clean anti-cavitation valve carefully, being sure that checks move freely and seat properly, or replace cartridge. See item 30.

30. Problems involving the control valve proper:
This valve is a precision device and is not intended for any extensive field adjustment or repair. Field replacement parts are limited to seal kits, and cartridges. Replacement of these parts, the opening of check cavities and certain relief valve cavities to examine for trapped dirt, or the resetting of the main relief valve with the use of good pressure gauge, should be referred to qualified service personnel. Dirt and shreds of packing material are the usual causes of valve malfunction. Be sure the reservoir oil supply is kept clean and only factory supplied packings are used in cylinder repair. Everything must be clean and free of dirt during the oil line removal and replacement, and during any cylinder work. See Valve Repair-Disassembly for procedure to follow for valve repair.

The inclusion of this information and its use does not imply that the warranty will remain effective on the valve if it is tampered with during the warranty period.

ASSEMBLY

The backhoe has been partially disassembled and strapped to a skid for shipping purposes. Initial installation on the tractor will require a hoist or other device capable of safely lifting the entire backhoe from the skid. After the initial installation is complete, the backhoe can serve as its own erecting hoist, by lowering stabilizers and bucket to the ground. Additional lifting devices will not be required for normal removal and reattaching.

NOTICE: Tighten all hardware to torque requirements specified in torque chart.

1. Remove the stabilizer assemblies and any miscellaneous items which have been fastened to the skid and arrange conveniently.

⚠ CAUTION

DO NOT cut any strapping that fastens the backhoe mainframe and swing frame to the skid base at this time.

2. Support boom and dipperstick with hoist and remove boom transport lock pin. Lower boom and manually extend dipperstick until it rests on ground. Move control handle to “BOOM DOWN” position as required to aid movement.

⚠ CAUTION

Be sure hoist being used is suitable, has sufficient capacity and is in the proper position. Do not allow anyone under a backhoe member supported by hoist.

3. Remove plastic bag containing bucket pins from backhoe. Attach bucket to dipperstick using one pin, two bolts, nuts, lockwashers, pin retainers and washers as needed to take up gap under pin retainers.

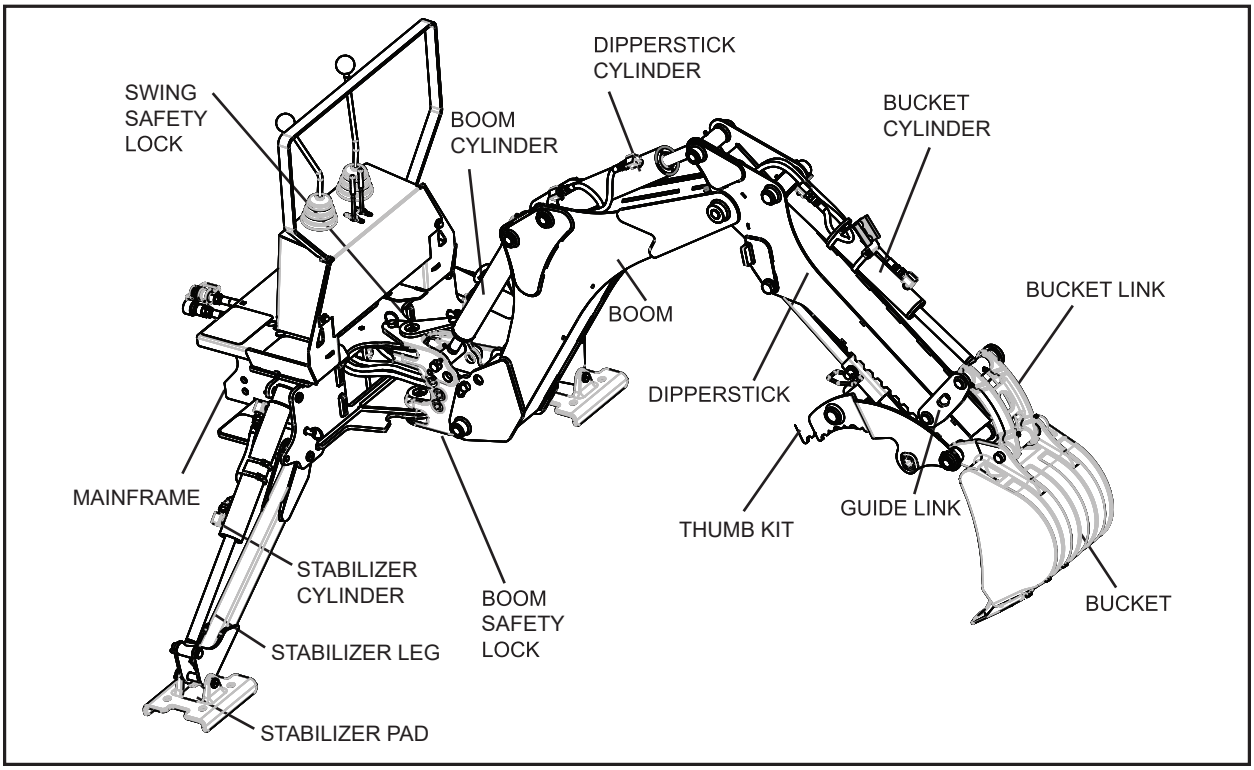
4. Attach bucket link to bucket, using same hardware as listed from step #3.

5. Reposition hoist to backhoe to prevent tipping. Remove all remaining strapping and attach stabilizers to mainframe using pins and hardware assembled to backhoe.

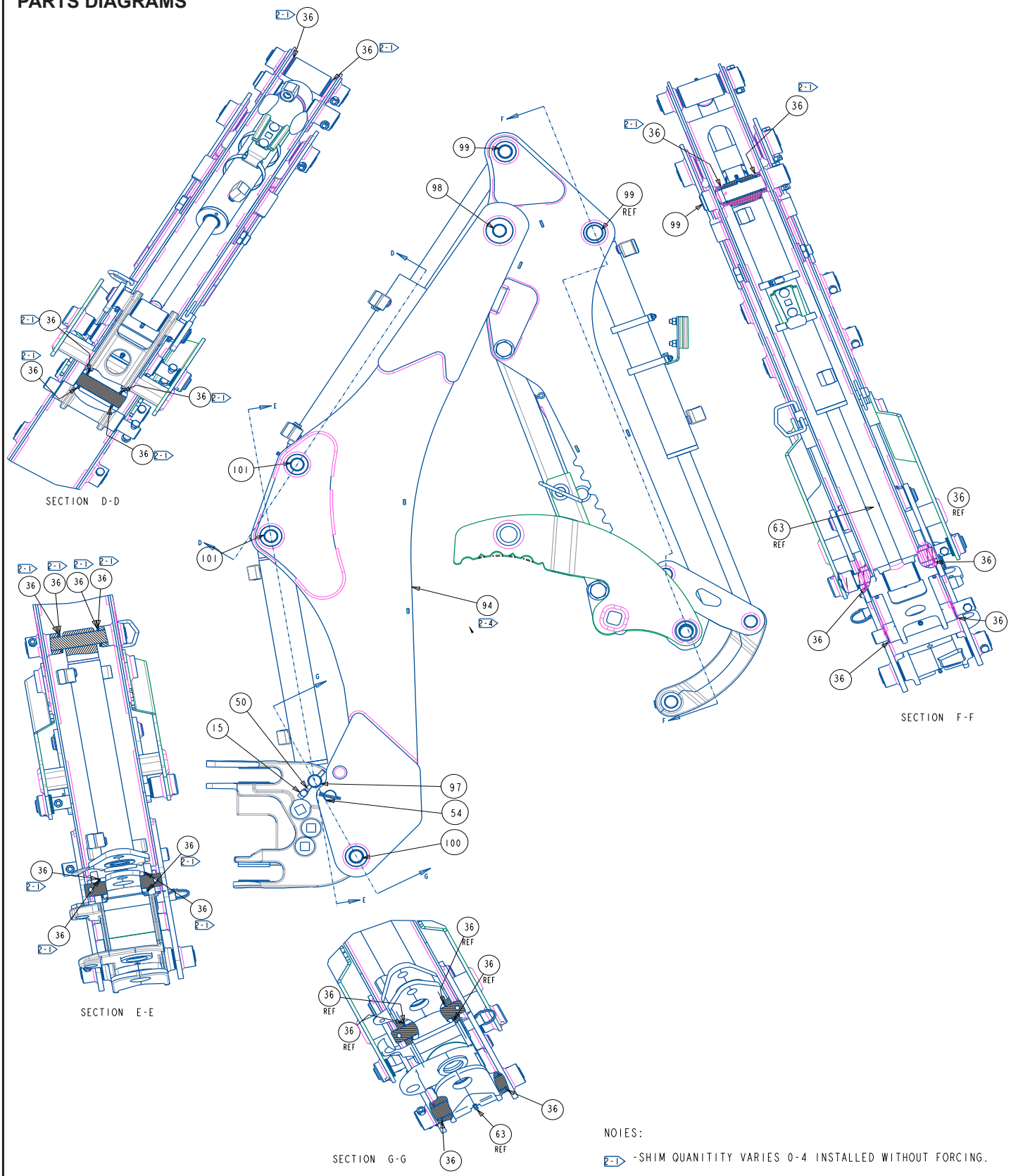
6. Attach stabilizer cylinders to stabilizers using pins and hardware assembled to stabilizers.

7. Using caution to prevent tipping, raise mainframe with hoist to a height of approximately 11” and remove skid. Block mainframe and swing frame securely.

8. Follow the Installing Backhoe to Tractor section to mount the backhoe to the tractor. Check the installation of the mount and hydraulics carefully per the Installing Mount and Hydraulic section of these instructions. Make sure that all members are correctly installed and securely fastened.

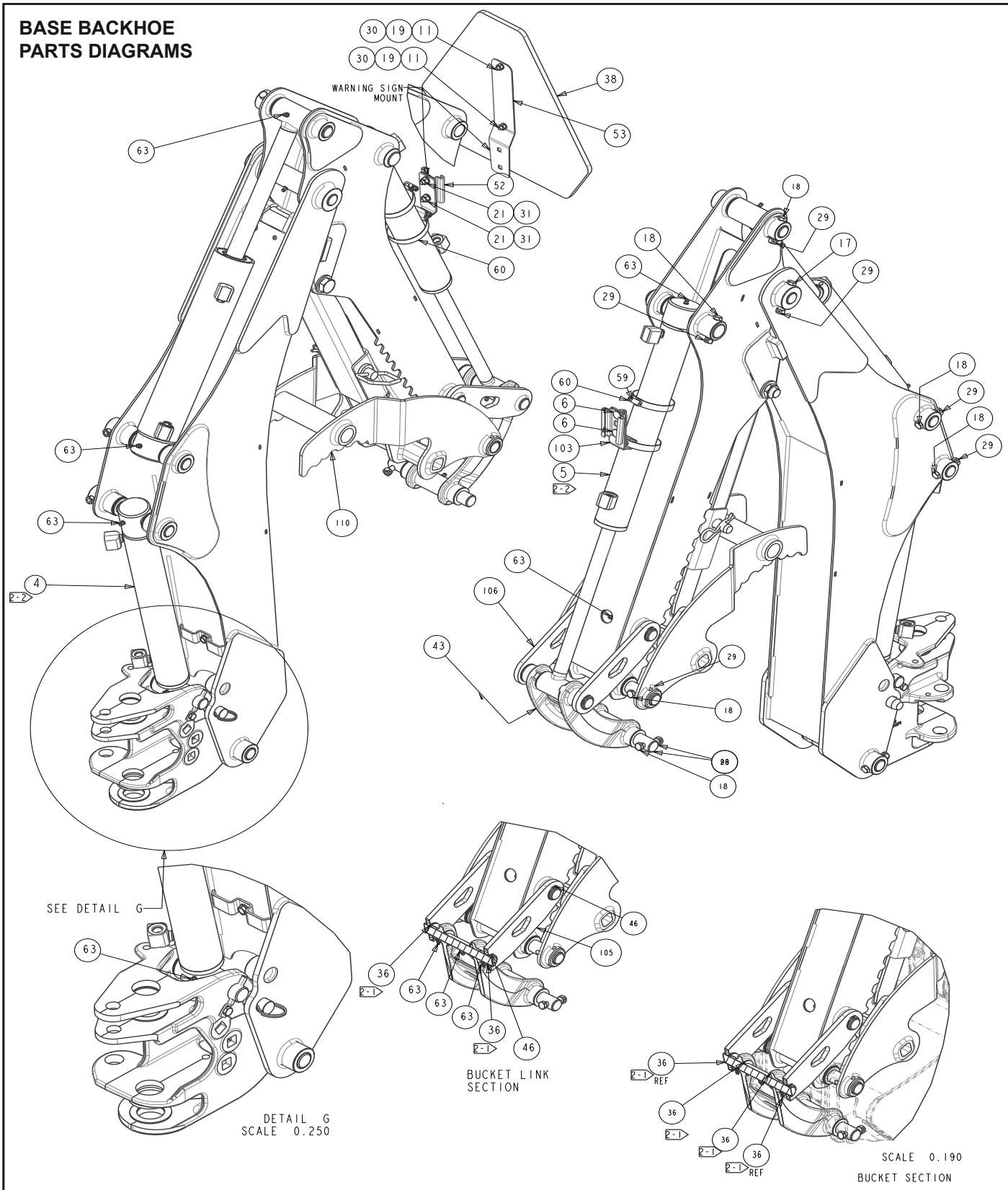


BASE BACKHOE
PARTS DIAGRAMS



(SEE PAGE 30 & 31 FOR PARTS LIST)

BASE BACKHOE PARTS DIAGRAMS



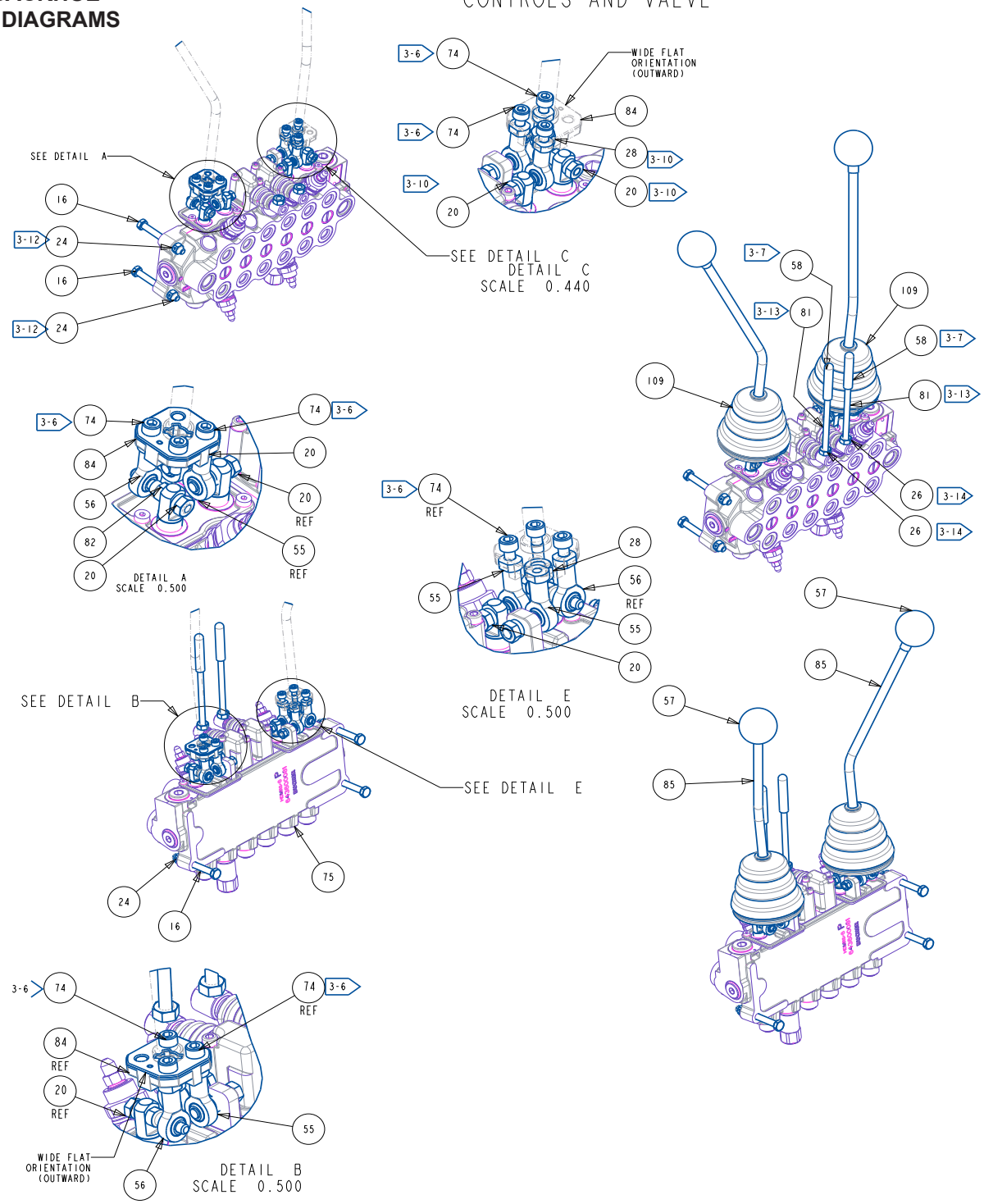
NOTES:

2-1 -SHIM QUANITITY VARIES 0-4 INSTALLED WITHOUT FORCING.

2-2 -HYDRAULICS CLEANLINESS:
PER ISO 4406
10 MICRON FILTER WITH 200 BETA RATION
(99.5% EFFICIENT)

(SEE PAGE 30 & 31 FOR PARTS LIST)

CONTROLS AND VALVE



TORQUE SPECS:

3-6 -5.2 N-M (+/-20%) (IN ADDITION, USE LOCTITE 242 BLUE)

3-7 -FACTORY ASSEMBLE USING LOCTITE 495

3-8 -BALL JOINT ORIENTATION IS CRITICAL TO ENSURE PROPER OPERATION OF "FLOAT" FEATURE IN CONTROL VALVE (2 PLCS)

3-10 -USE LOCTITE 242 BLUE

3-12 -TORQUE SPEC: 108 IN-LBS (+/-20%)

3-13 -USE LOCTITE 242 BLUE TO SECURE CONTROL LEVER #066215 INTO CONTROL VALVE ASSEMBLY #023325

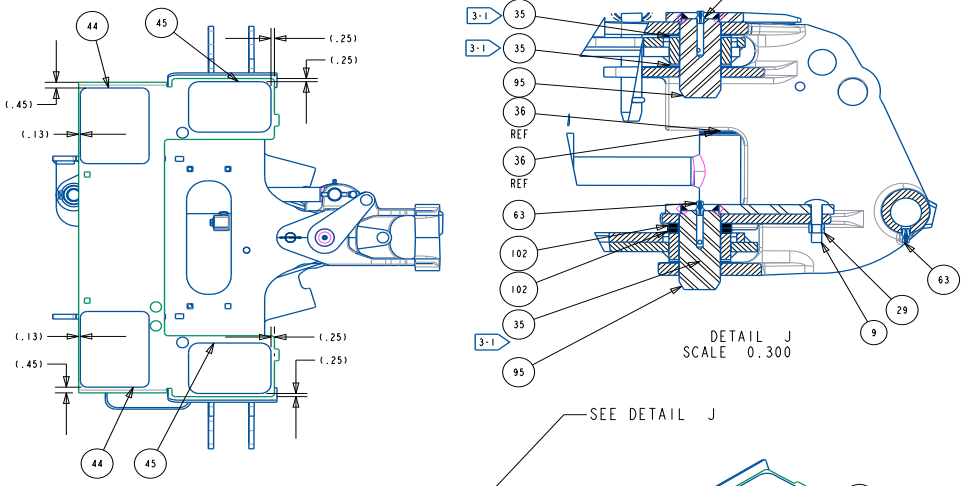
3-14 -TORQUE SPEC. 9.5 N-M (+/-20%), IN ADDITION USE LOCTITE 242 BLUE TO SECURE NUT #007441 TO CONTROL LEVER #066215

3-15 -FIELD SERVICE ONLY: (AMEREQUIP 066236),(AMEREQUIP 066328)CONTROL HANDLE CASTINGS, AND CONTROL HANDLE SERVICE KIT (AMEREQUIP 847610)

(SEE PAGE 30 & 31 FOR PARTS LIST)

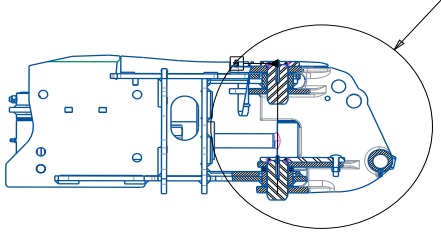
BASE BACKHOE
PARTS DIAGRAMS

SWING FRAME

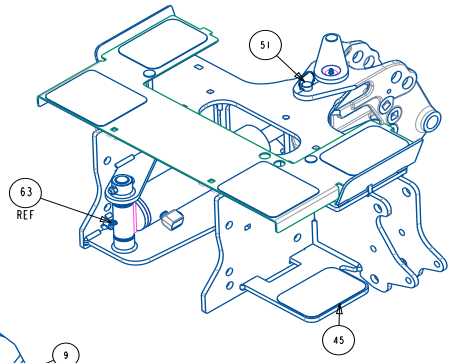


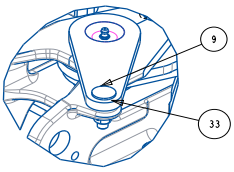
DETAIL J
SCALE 0.300

SEE DETAIL J

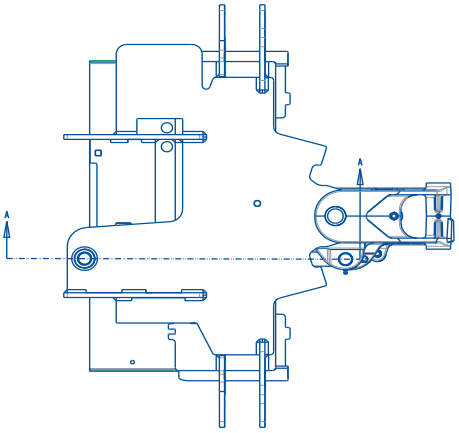


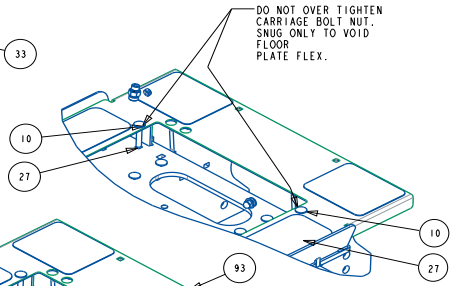
SECTION B-B
SCALE 0.150

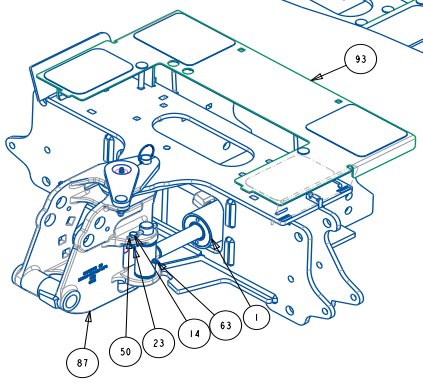


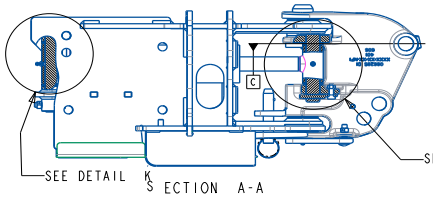


SCALE 0.313

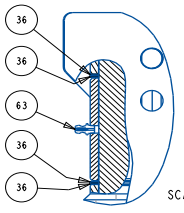




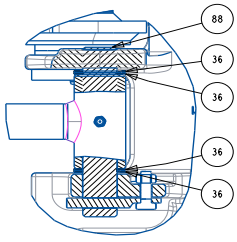




SECTION A-A



DETAIL K
SCALE 0.375



DETAIL L
SCALE 0.375

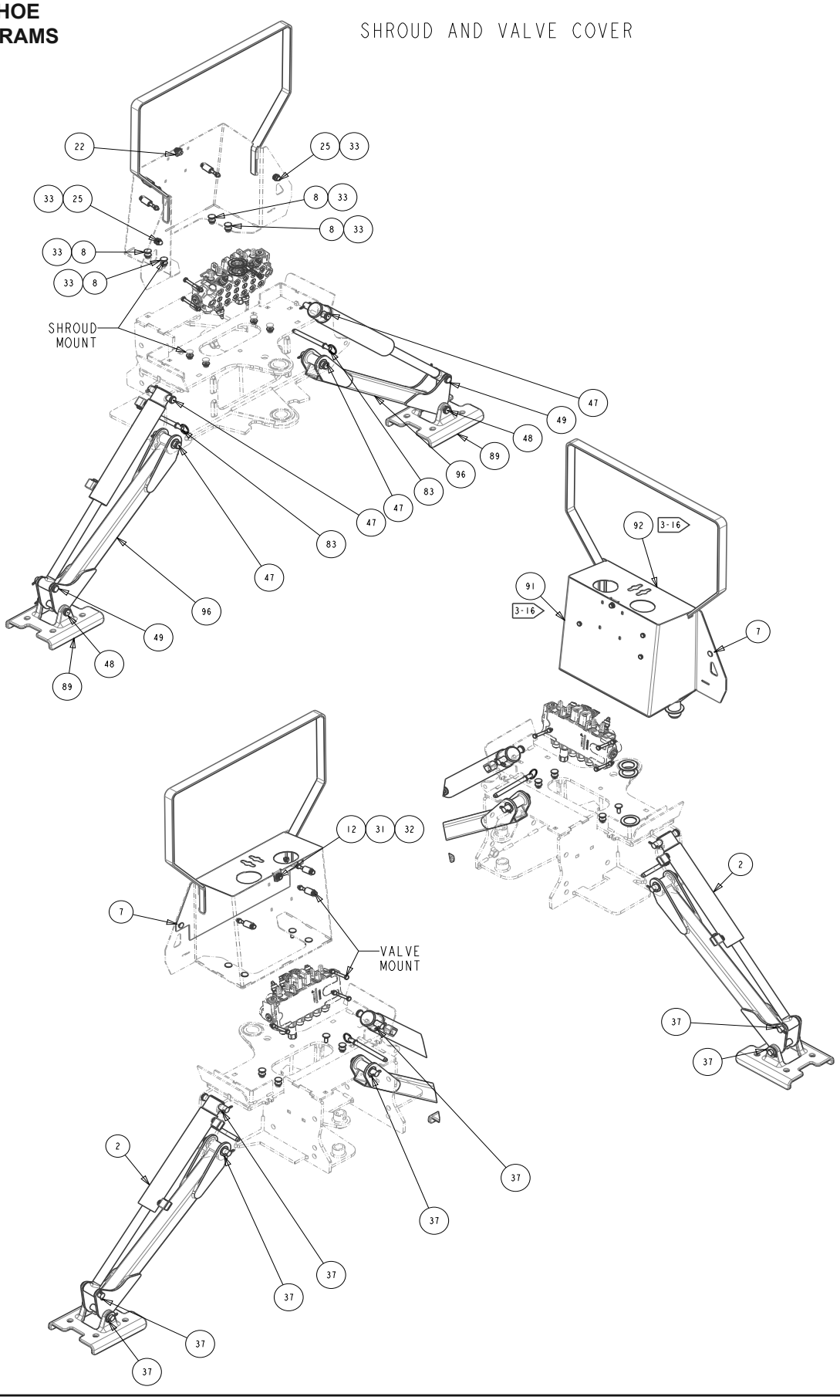
NOTES:

3-1 SHIM LOCATION:
ASSEMBLED LOOSENESS EQUAL TO ONE SHIM WIDTH MAX.

(SEE PAGE 30 & 31 FOR PARTS LIST)

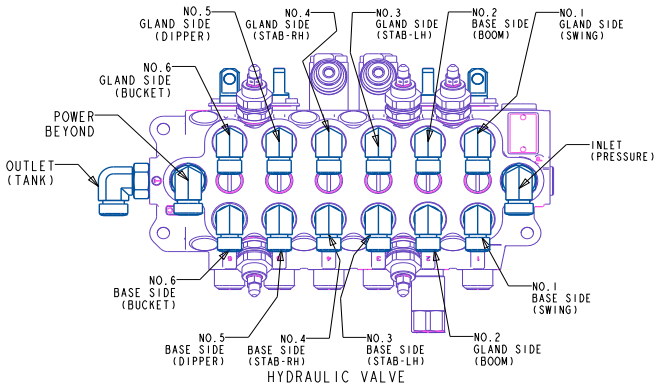
BASE BACKHOE
PARTS DIAGRAMS

SHROUD AND VALVE COVER

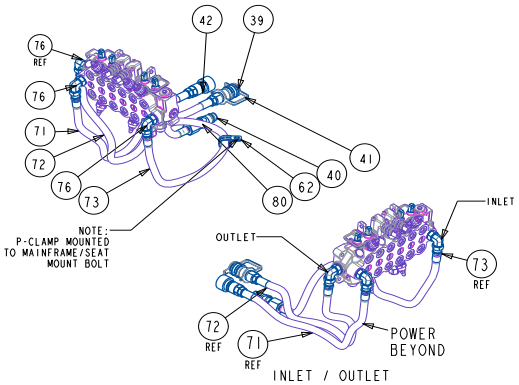


(SEE PAGE 30 & 31 FOR PARTS LIST)

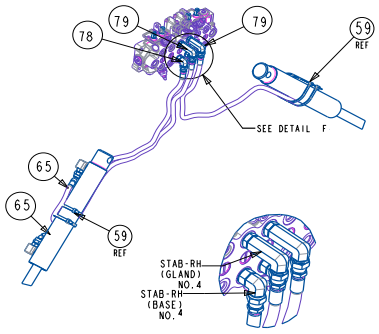
BASE BACKHOE PARTS DIAGRAMS



HYDRAULIC VALVE

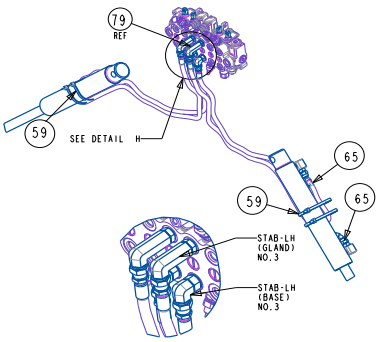


INLET / OUTLET

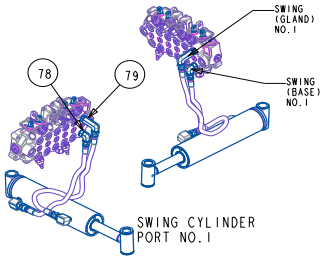


DETAIL F SCALE 0.250

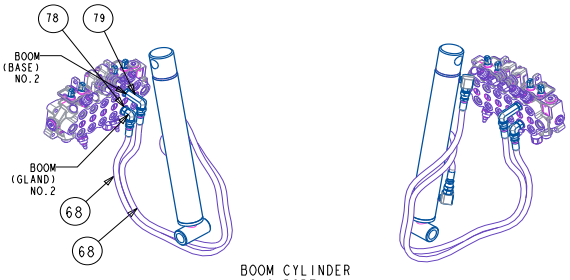
STAB - CYLINDERS NO.3 & 4 PORTS



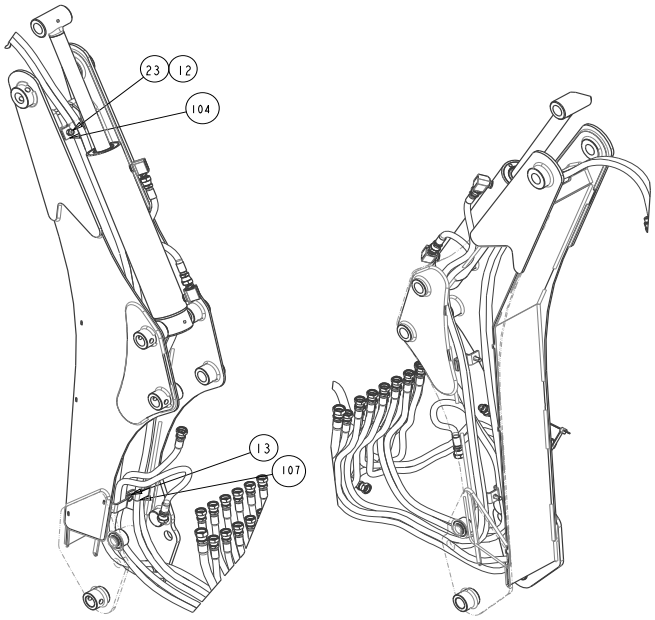
DETAIL H SCALE 0.250

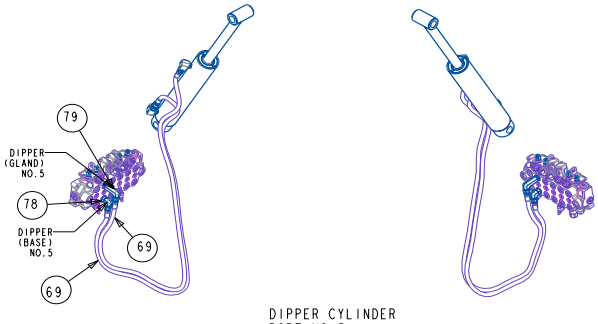


SWING CYLINDER PORT NO.1

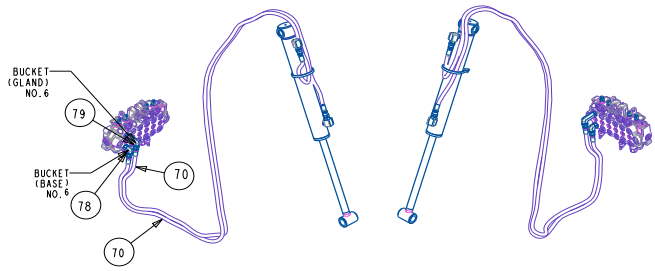


BOOM CYLINDER NO.2 PORT


BOOM ASSY-HOSE SUPPORT BRACKETS



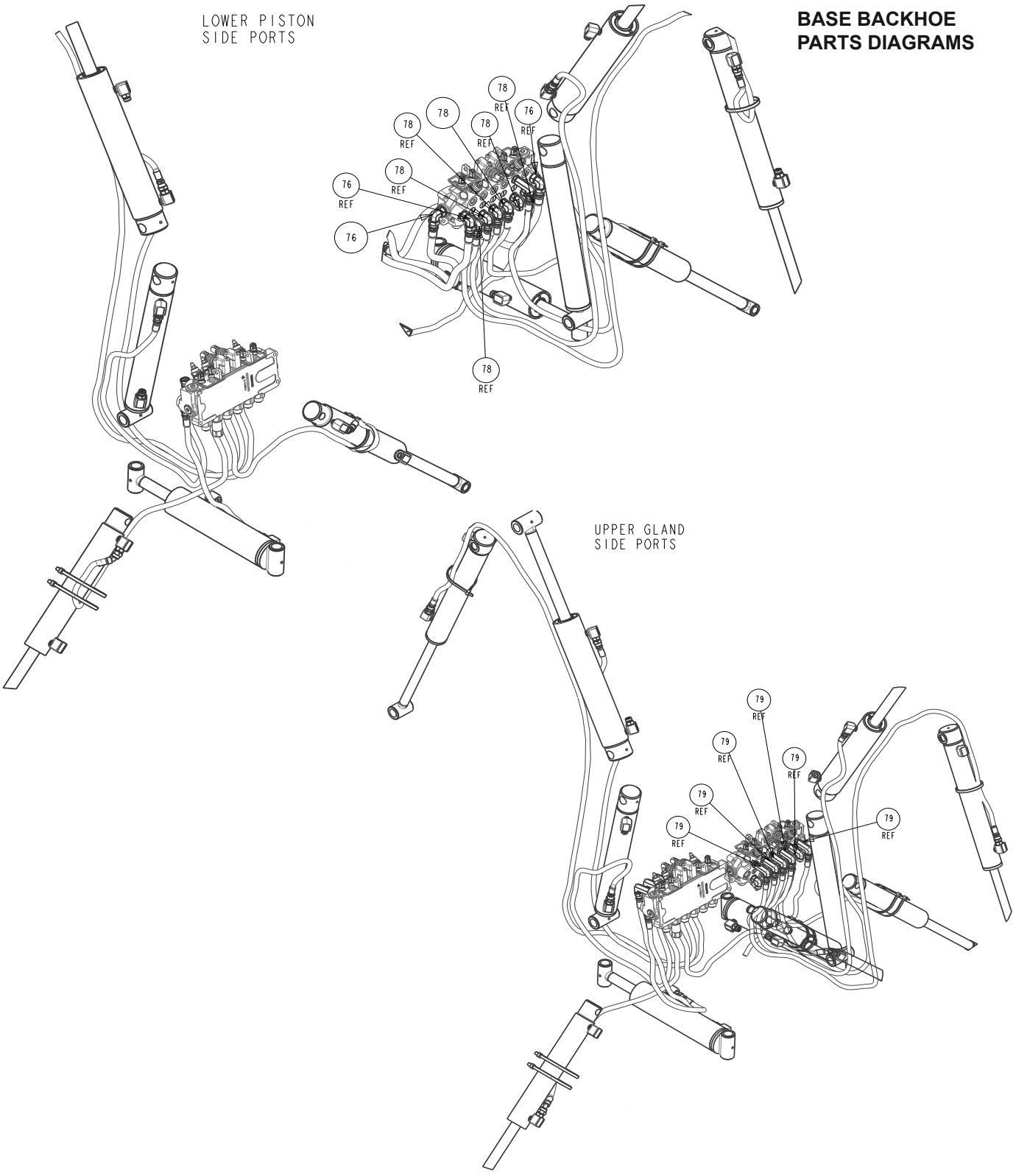
DIPPER CYLINDER PORT NO 5 .



BUCKET CYLINDER PORT NO.6

(SEE PAGE 30 & 31 FOR PARTS LIST)

BASE BACKHOE PARTS DIAGRAMS



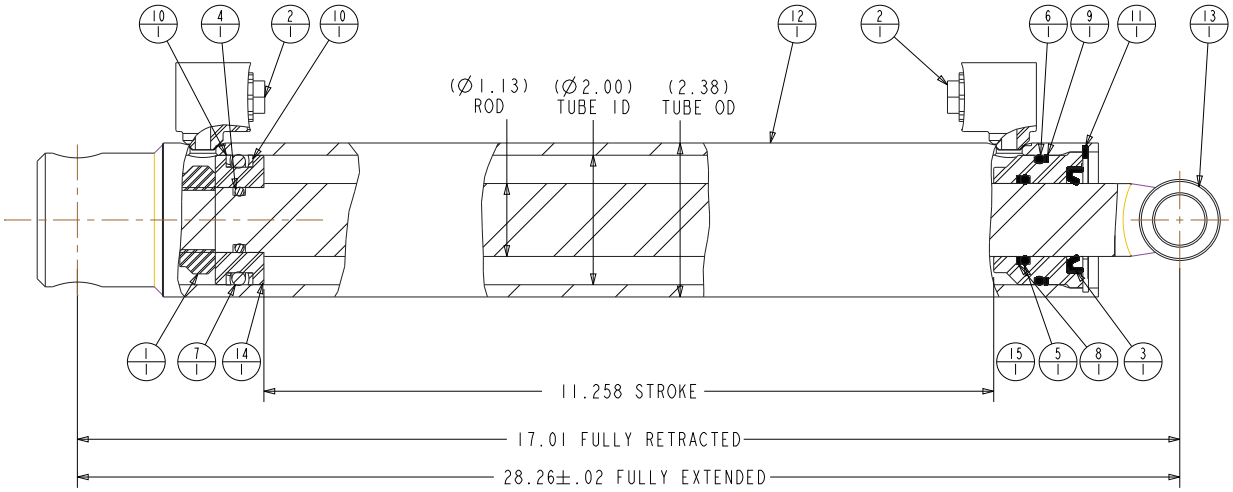
NOTES:
MAIN RELIEF SETTING VERIFICATION:2175 PSI

(SEE PAGE 30 & 31 FOR PARTS LIST)

BASE BACKHOE PARTS BREAKDOWN			
INDEX	QTY	PART NUMBER	DESCRIPTION
1	1	000307	ASSY-HYD CYL (SWING)
2	2	000313	ASSY-HYD CYL (STAB)
3	1	000314	ASSY-DIPPER CYL
4	1	000315	ASSY-HYD CYL (BOOM)
5	1	000316	ASSY-CYLINDER (BUCKET)
6	2		BOLT,CARR.-5/16"-UNC 3/4"L,GR5
7	2		BOLT,CARR.-5/16"-UNC 1/2"L,GR5
8	4		BOLT,CARR.-3/8"-16 UNC 1.0"L,GR2
9	2		BOLT,CARR.-3/8"-16 UNC 1-1/2"L,GR5
10	2		BOLT,CARR.-3/8"-16 UNC 3.0"L,GR2
11	2		HHCS 1/4-20 UNC 3/4",GR2
12	2		HHCS 5/16-18 UNC 3/4"L,GR5
13	2		SCREW,TAPTITE 5/16"-18,.75 LG
14	1		HHCS 5/16-18 UNC 1.00"L,GR5
15	2		HHCS 5/16-24 UNF 1.13"L,GR5
16	3		HHCS 5/16-24 UNF 2-3/4"L,GR8
17	1		HHCS 3/8-24 UNF 2-1/2"L,GR8
18	8		HHCS 3/8-24 UNF 2-0"L,GR8
19	2		NUT,HEX 1/4-20 UNC,GR2
20	6	007428	NUT, LOCK, NYLON M7-1.00, CL8
21	2		NUT,HEX 5/16-18 UNC,GR5
22	1		NUT, SPRING (J-STYLE) 5/16-18 UNC
23	2		NUT,LOCK,MID 5/16-18 UNC,GR 2
24	3		NUT,LOCK,MID 5/16-24 UNF,GR 2
25	2		NUT, ACORN 5/16"-18 UNC
26	2	007441	NUT, HEX, MM M8-1.00 THRD, CL8
27	6		NUT,HEX,LK FLG (NYLON) 3/8-16 UNC
28	6		NUT,LOCK,MID 3/8-16 UNC,GR 2
29	10		NUT,LOCK,MID 3/8-24 UNF,GR 2
30	2		WASHER, SPLIT LOCK 1/4" NOM
31	3		WASHER, SPLIT LOCK 5/16" NOM
32	1		WASHER, SAE,LC 5/16"ID NOM
33	4		WASHER, SAE,LC 3/8"ID NOM
34	2	008193	WASHER,SAE,HRD 3/4"ID NOM
35	3	008232	BUSHING,MACH. Ø2-1/4"/Ø1-1/2"/14GA
36	36	008283	BUSHING,MACH. Ø1-1/2"/Ø1.0"/18GA
37	8	008582	PIN, COTTER, 3/16" OD WIRE 1-1_4" LG
38	1		EMBLEM, SMV
39	1	011274	COUPLER BODY
40	1	011298	COUPLER, NOSE
41	1	011299	PLUG,DUST HYDR. -6 (3/8")-BLACK
42	1	011304	COUPLER, BODY (PARKER 4050-15P)
43	1	012549	BUCKET LINK - CAST
44	2	012910	PAD,STEP-NON-SLIP 5.00"x6.00"
45	3	012916	PAD,STEP-NON-SLIP 6.00"x4.00"
46	2	013251	RING, EXT. 63/64", SHR-98
47	4	013366	PIN, CLEVIS 3/4"OD,3.75" LG
48	2	013372	PIN, CLEVIS 3/4"OD,4.50" LG
49	2	013461	PIN, CLEVIS 3/4"OD,3.00" LG
50	3	013473	PIN,RETAINER Ø5/16/2.31 LG/Ø.313 H
51	1	013505	PIN,QK REL Ø3/4"/3.00 EL
52	1		SMV SOCKET
53	1		BRACKET, SMV
54	1	013744	PIN,QK REL Ø7/8"/6.20 EL
55	4	014010	BALL JOINT (STUD)
56	2	014013	BALL JOINT, FEMALE M6 X 1.0
57	2	014058	CONTROL KNOB
58	2	014088	CAP - RUBBER
59	5		TIE, CABLE, POLY. 11.75 LG
60	2		CLAMP,HOSE,GR DR 40 (Ø2.06-Ø3.00)

BASE BACKHOE PARTS BREAKDOWN CONTINUED			
INDEX	QTY	PART NUMBER	DESCRIPTION
61	A/R		FLUID,HYDRAULIC
62	1	014242	CLAMP,RUBBER-"P" 1.0" OD
63	17		FITTING,GREASE,STR 1/4"-28 TAPPERED
64	1		ASSY, HOSE KIT (SUMMIT)
65	4	017229	ASSY,HOSE,HYDRAULIC #4 HOSE,6-6
66	1	017230	ASSY,HOSE,HYDRAULIC #4 HOSE, 6-6
67	1	017231	ASSY,HOSE,HYDRAULIC #4 HOSE, 6-6
68	2	017233	ASSY,HOSE,HYDRAULIC #4 HOSE, 6-6
69	2	017234	ASSY,HOSE,HYDRAULIC #4 HOSE,6-6
70	2	017237	ASSY,HOSE,HYDRAULIC #4 HOSE,6-6
71	1	018315	ASSY,HOSE,HYDRAULIC #6 HOSE,8-6
72	1	018316	ASSY,HOSE,HYDRAULIC #6 HOSE,8-6
73	1	018350	ASSY,HOSE,HYDRAULIC #6 HOSE,8-6
74	6	018510	SHCS,M6.0-1.00 16L,CL8.8
75	1	023325	VALVE-CONTROL (BUCHER)
76	3	024140	FITTING,ELB.90,MORB x MORFS 6-8
77	12	024141	FITTING, MORFS x MORB 6-6
78	6	024142	FITTING,ELB.90,MORB x MORFS 6-6
79	6	024143	FITTING, ELB. 90,MORFS x MORB 6-6
80	1	024508	FITTING,MORB X MNPT 8-8
81	2	066215	7mm CONTROL LEVER
82	2	066234	ROD-SLIDING CONTROL VALVE
83	2	066317	PIN,QK REL Ø1/2"/4.60 EL
84	2	066326	CONTROL BLOCK
85	2	066328	ROD-HANDLE (CONTROL)
86	1	847110	WELDMENT-DIPPER
87	1	847401	CASTING, SWING FRAME MACHINED
88	1	847404	PIN,INDUCT. HARDEN Ø1.00 x5-3/8 LG
89	2	847415	ASSY,STAB PAD (PAINT) (BLACK)
90	1	847615	WELDMENT-MAINFRAME
91	1	847630	WELDMENT-SHROUD
92	1	847634	PLATE-VALVE COVER
93	1	847637	PLATE-FLOOR
94	1	847675	WELDMENT-BOOM
95	2	848310	WELDMENT,PIN
96	2	849000	WELDMENT-STAB LEG
97	1	849101	PIN,INDUCT. HARDEN Ø1.00 x5-11/16 LG
98	2	849103	PIN,INDUCT. HARDEN Ø1.00 x7-7/8 LG
99	2	849104	PIN,INDUCT. HARDEN Ø1.00 x6-9/16 LG
100	1	849106	PIN,INDUCT. HARDEN Ø1.00 x8-1/2 LG
101	3	849107	PIN,INDUCT. HARDEN Ø1.00 x7-7/16 LG
102	2	855171	WASHER, THRUST PLATE
103	1	857921	PLATE-SMV SOCKET MOUNT
104	2	860399	PLATE-HOSE CLAMP
105	1	865308	LINK-GUIDE
106	1	865325	WELDMENT-GUIDE LINK
107	1	866104	PLATE-HOSE CLAMP (DOUBLE)
108			
109	2	014077	BOOT,JOYSTICK
110	1		ASSY-DIPPER THUMB 6-1/4"
111	1	S0B1730	BUCKET, CAST (12 IN)

STABILIZER CYLINDER



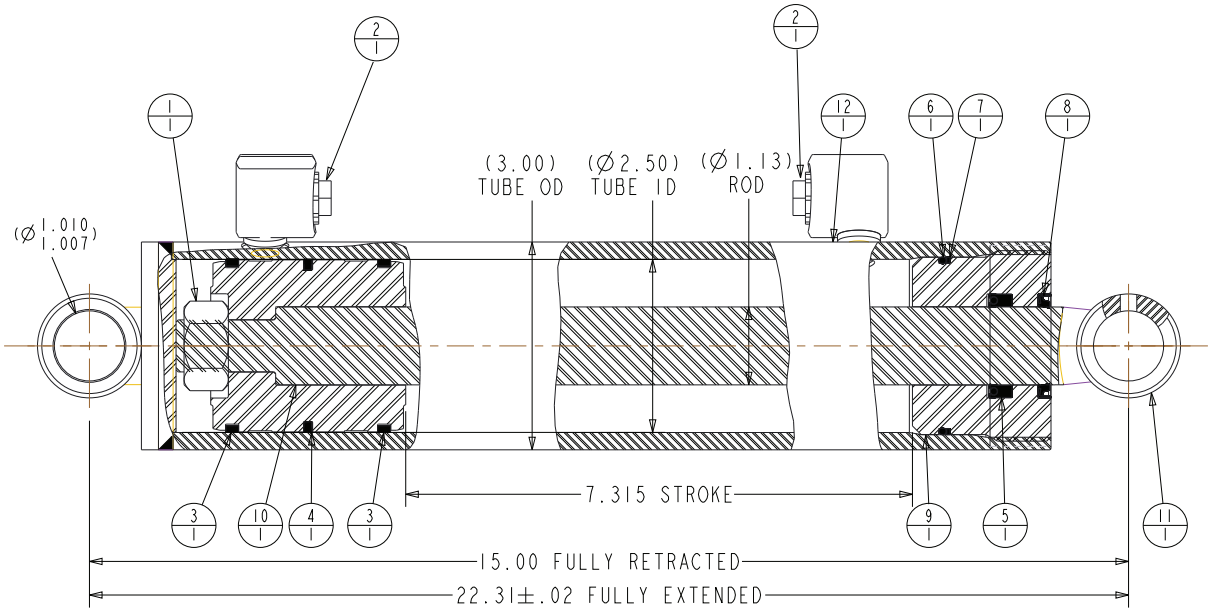
000313 - STABILIZER CYLINDER

Index	Description	Number
1	Nut, 1” NF Nylok	007712 (*)
2	Plug	N/A
3	Oil Seal, 1-5/8 OD x 1-1/8 ID	*
4	O-Ring, 1” OD x 3/4 ID	*
5	O-Ring, 1-3/8 OD x 1-1/8 ID	*
6	O-Ring, 2” OD x 1-3/4 ID	*
7	O-Ring, 2” OD x 1-5/8 ID	*
8	Leather Washer	*
9	Back-Up Ring	*
10	Back-Up Ring	*
11	Retaining Ring	*
12	Cylinder Tube Weldment	N/A
13	Piston Rod Weldment	903920
14	Piston	N/A
15	Gland	N/A

Seal Kit (Items denoted with * , less Piston)	904260
For Complete Hydraulic Cylinder, order	000313

IMPORTANT - Replace cylinder Nut (1) any time nut must be removed, and torque to 140 Lb-Ft.

SWING CYLINDER



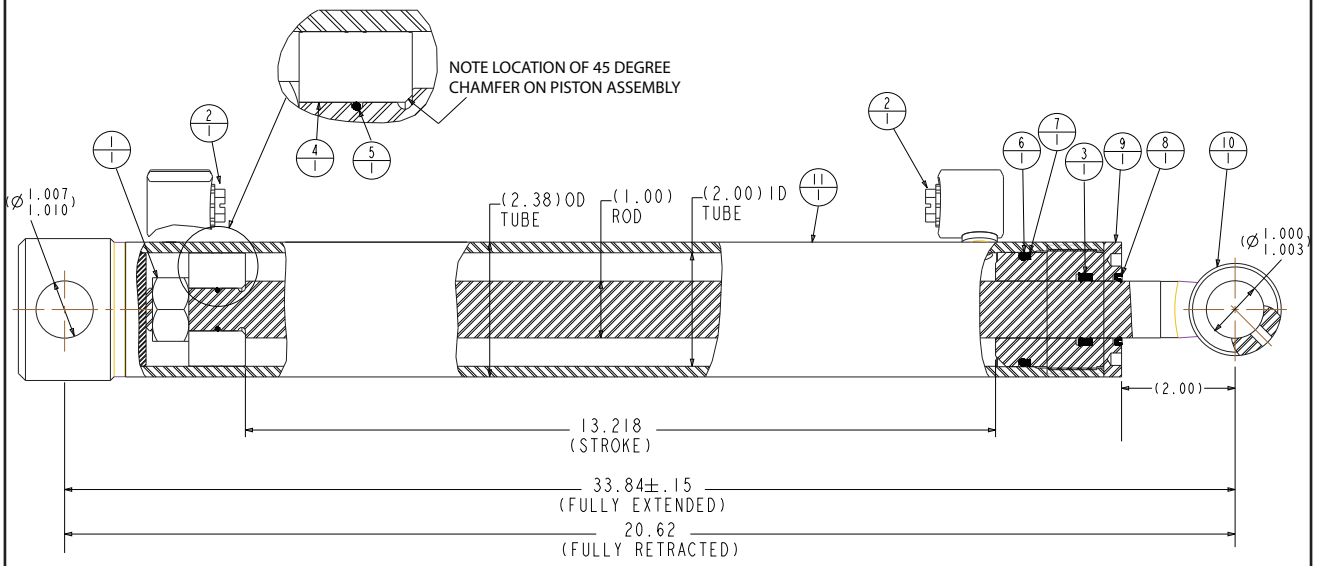
000307 - SWING CYLINDER

Index	Description	Number
1	Nut, 3/4" NF Nylok	007574 (*)
2	Port Plug	N/A
3	Piston Ring	*
4	Piston Seal	*
5	Rod Seal	*
6	O-Ring	*
7	Back-Up Ring	*
8	Wiper Seal	*
9	Threaded Gland	N/A
10	Piston	N/A
11	Piston Rod Weldment	908630
12	Cylinder Tube Weldment	N/A

Seal Repair Kit (Items denoted with *) 908290
For Complete Hydraulic Cylinder, order 000307

IMPORTANT - Replace cylinder Nut (1) any time nut must be removed, and torque to 200 Lb-Ft.

BUCKET CYLINDER



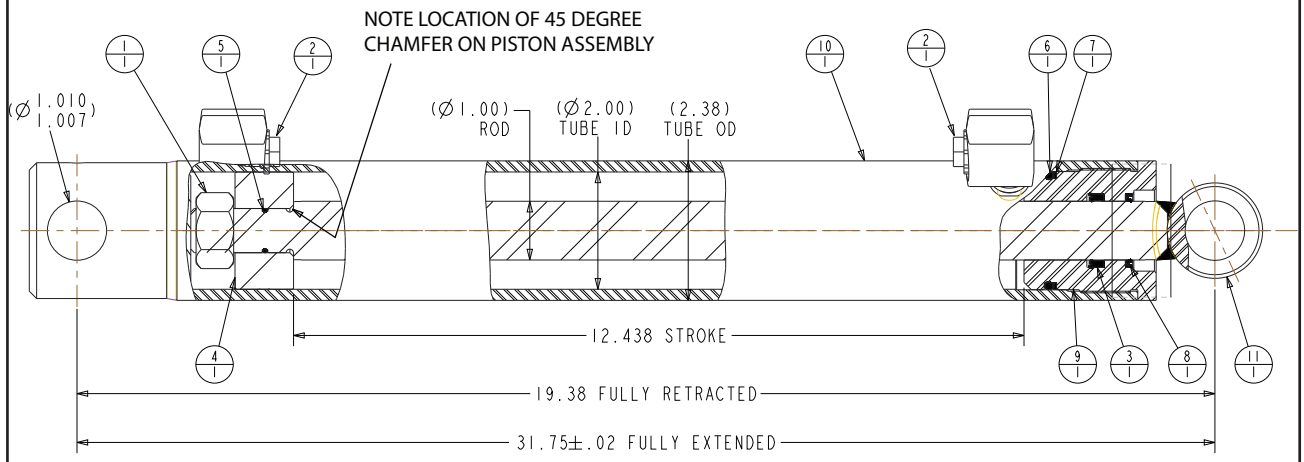
000316 - BUCKET CYLINDER

Index	Description	Part No.
1	Nut, 3/4 NF Nylok	007574 (*)
2	Port Plug	N/A
3	Rod Seal	*
4	Piston	011684
5	O-Ring	*
6	O-Ring	*
7	Back-Up Ring	*
8	Wiper Seal	*
9	Threaded Gland	N/A
10	Piston Rod Weldment	903760
11	Cylinder Tube Weldment	N/A

Seal Repair Kit (Items denoted with *) 903640
For Complete Hydraulic Cylinder, order 000316

IMPORTANT - Replace cylinder Nut (1) any time nut must be removed, and torque to 135 Lb-Ft.

BOOM CYLINDER



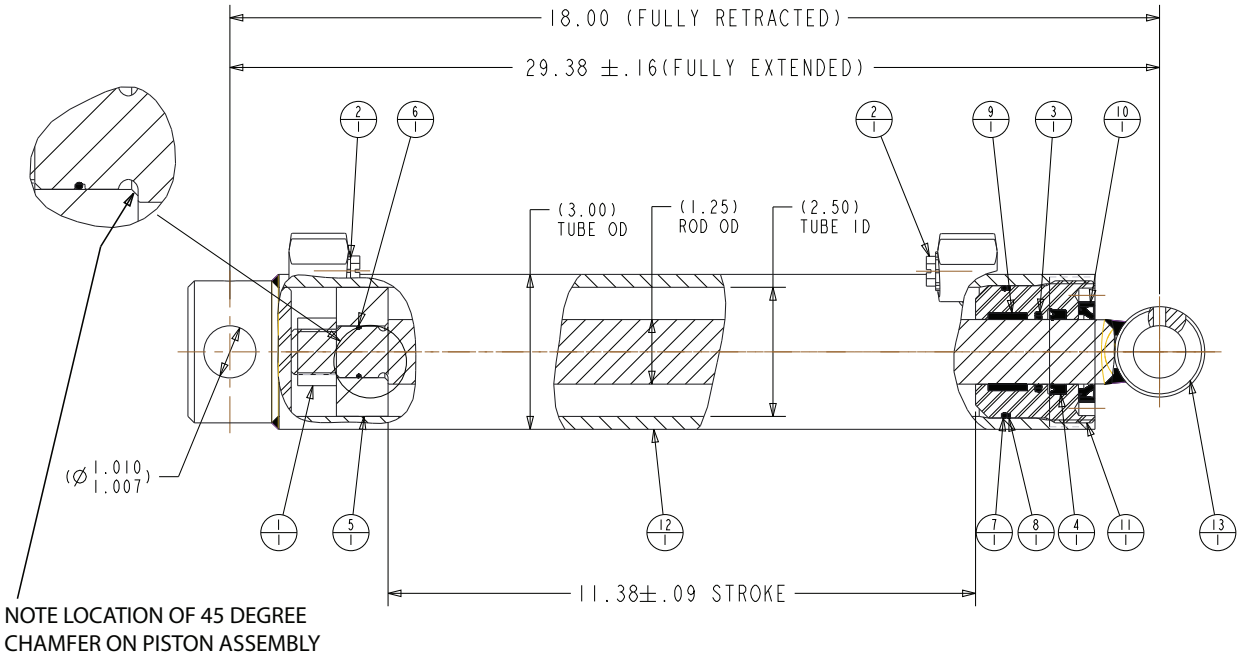
000315 - BOOM CYLINDER

Index	Description	Number
1	Nut, 3/4 NF Nylok	007574 (*)
2	Cap Plug, 9/16-18 Th'd with O-Ring	N/A
3	Rod Seal	*
4	Piston	011684
5	O-Ring	*
6	O-Ring	*
7	Back-Up Ring	*
8	Rod Wiper	*
9	Threaded Gland	N/A
10	Cylinder Tube Weldment	N/A
11	Piston Rod Weldment	903930

Seal Repair Kit (Items denoted with *)	903580
For Complete Hydraulic Cylinder, order	000315

IMPORTANT - Replace cylinder Nut (1) any time nut must be removed, and torque to 200 Lb-Ft.

DIPPERSTICK CYLINDER



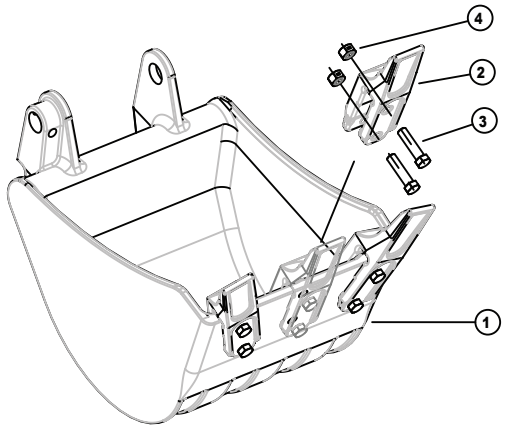
000314 - DIPPERSTICK CYLINDER

Index	Description	Part No.
1	Nut, 7/8 NF Nylok	007609 (*)
2	Cap Plug, 9/16-18 Th'd with O-Ring	N/A
3	Step Seal	*
4	U-Cup Seal	*
5	Piston Assembly	011688
6	O-Ring	*
7	O-Ring	*
8	Back-Up Ring	*
9	Wear Ring	*
10	Wiper Seal	*
11	Gland	N/A
12	Cylinder Tube Weldment	N/A
13	Piston Rod Weldment	908655
	Seal Repair Kit (Items denoted with *)	908085
	For Complete Hydraulic Cylinder, order	000314

IMPORTANT - Replace cylinder Nut (1) any time nut must be removed, and torque to 260 Lb-Ft.

BACKHOE BUCKETS

Index	Number	Description
1	SMB1726	8” Bucket
	SMB1730	12” Bucket
	SMB1728	16” Bucket
2	066339	Tooth
3	006952	Bolt, 7/16 NF x 1-3/4 Gr 5
4	007487	Locknut, 7/16 NF

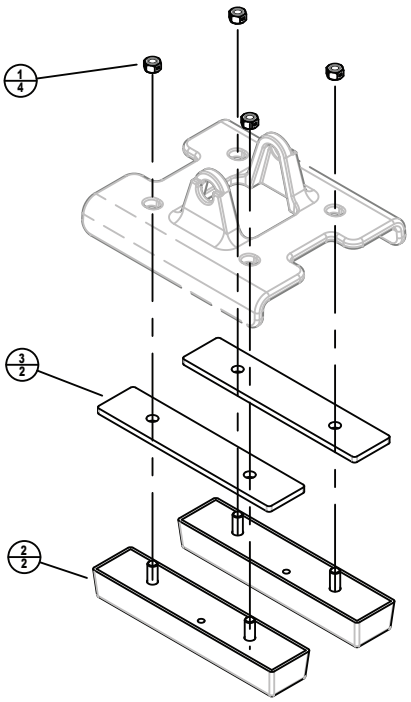


Bucket Data:

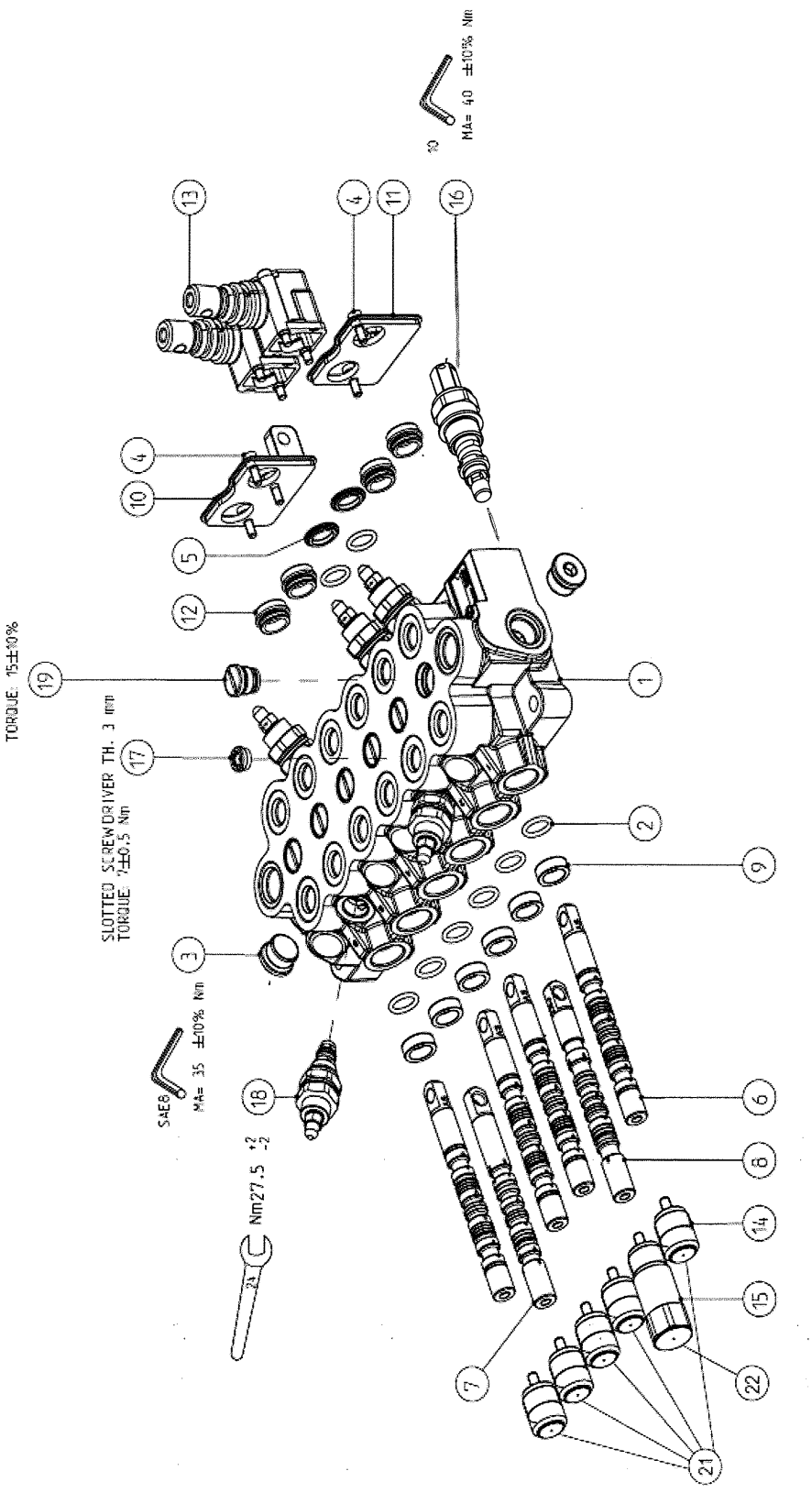
Number	Width	SAE Struck Capacity	Heaped Capacity	Shipping Weight
SMB1726	8”	.42 cu.ft.	.46 cu.ft.	38 lbs.
SMB1730	12”	.66 cu.ft.	.76 cu.ft.	59 lbs.
SMB1728	16”	.90 cu.ft.	1.06 cu.ft.	56 lbs.

SMB1692 OPTIONAL STREET PAD KIT

Index	Number	Description
1	007458	Locknut, 3/8NC
2	012899	Street Pad - Rubber
3	849149	Spacer Plate



CONTROL VALVE SERVICE COMPONENTS

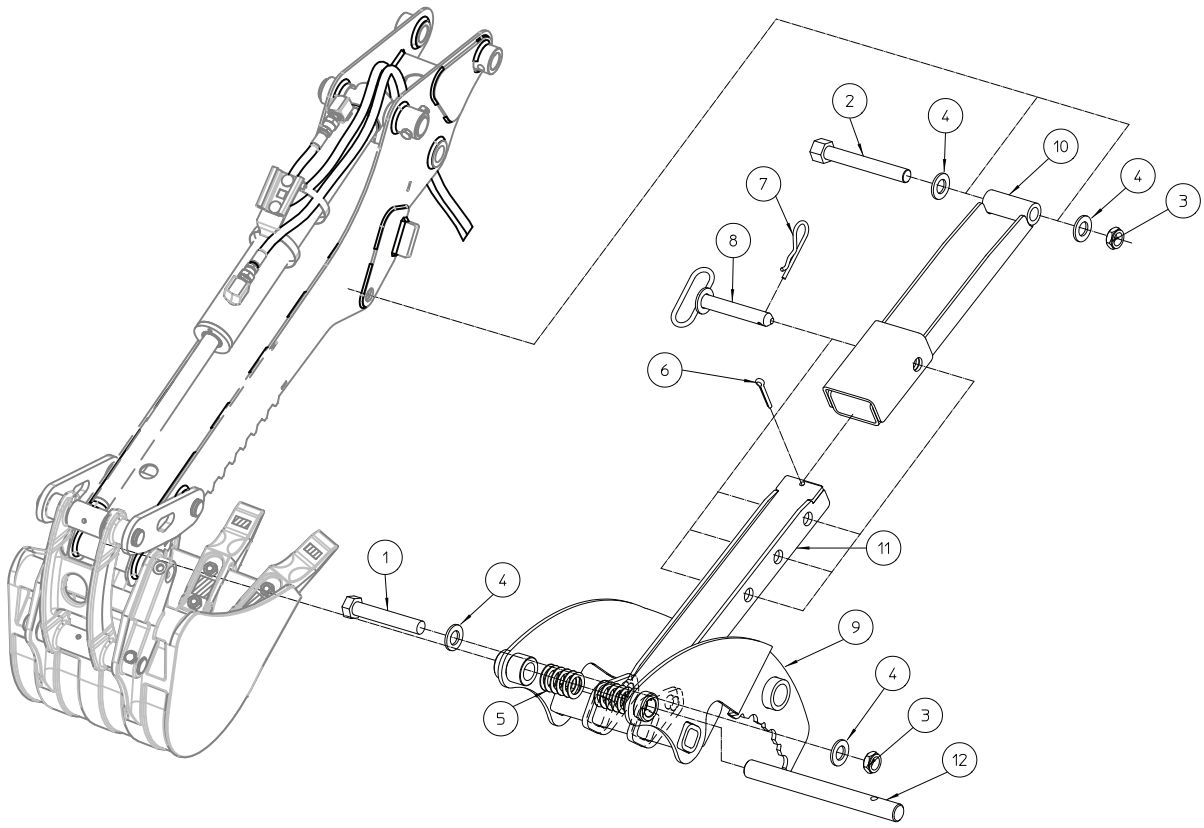


(SEE PAGE 39 FOR PARTS LIST)

SERVICE COMPONENTS FOR CONTROL VALVE

INDEX	Amerequip Part Number	Vendor Part Number	Description	Quantity Per Valve
1	N/A	N/A	Valve Casting Body	1
2	N/A	N/A	Spool Seal (Part of Index No.24)	8
3	023214		3/4-16UNF SAE8 Plug	2
4	018511		M5x 16 DIN 7984 Socket Screw	5
5	N/A	N/A	Metal Washer (Part of Index No.24)	2
6	N/A	N/A	Spool	4
7	N/A	N/A	Spool - Intense Metering	1
8	N/A	N/A	Boom Spool for Non-Detented "Float" - Intense Meterinfg	1
9	N/A	N/A	Spacer	6
10	023314		Right Hand Base Angle Bracket Casting	1
11	023315		Left Hand Base Angle Bracket Casting	1
12	N/A	N/A	Spacer with O-Rings (Part of Index No.24)	4
13	023217		Stabilizer Lever Box Assembly	2
14	023221		Positioner	5
15	023222		Boom Positioner with Non-Detented "Float"	1
16	023306		Main Relief Cartridge Components - 2100 PSI	1
17	023218		.046 inch Orifice Assembly - (located in "positioner side" of work port of Boom Circuit)	1
18	023301		Work Port Relief Valve - 2575psi - Two in Boom Circuit, Two in Dipper Circuit, & 1 in Swing Circuit	5
19	023220		Load Check Valve	6
20				
21	N/A	N/A	Plug for Postioner (Part of Index No. 23)	5
22	N/A	N/A	Plug for Boom Positioner (Part of Index No. 23)	1
23	023307		Plastic Cap Kit (Contains 5 of Index 21 and 1 of Index 22)	1
24	023318		Control Valve Seal Service Kit - (Consists of Index No. 2, 5, & 12)	1
25	023325		Complete Valve Assembly	

MECHANICAL THUMB KIT



Index	Qty	Number	Description
1	1	007260	Hex Head Cap Screw, 3/4-16 x 4.50 Gr 5
2	1	007274	Hex Head Cap Screw, 3/4-16 x 5.50 SAE Gr 5
3	2	007679	Nut, Hex 3/4-16 Jam Nylock Lock
4	4	008192	Flat Washer, 3/4 SAE
5	12	008283	Machine Bushing 1 x 1-1/2 x 18G
6	1	008602	Cotter Pin, 1/4 x 1-1/2
7	1	008623	Hair Pin Clip, #6
8	1	013510	Mount Pin
9	1	849900	Mechanical Thumb Weldment
10	1	849905	Upper Column Weldment
11	1	849910	Lower Column Weldment
12	1	865454	Pin

BACKHOE - DIMENSIONS AND SPECIFICATIONS

	Maximum Digging Depth	78 inches
A	Digging Depth (two foot flat bottom)	76 inches
B	Swing Arc	148 degrees
C	Loading Height (bucket at 60 deg)	64 inches
D	Reach from Center line of Swing Pivot	109 inches
E	Transport Height (maximum)	72 inches
F	Bucket Rotation	180 degrees
G	Loading Reach (bucket at 60 deg)	35 inches
H	Transport Overhang	37 inches
I	Undercut	15 inches
J	Stabilizer Spread, down position	74 inches
K	Stabilizer Spread, up position	59 inches
	Bucket Cylinder Digging Force	2270 lbs
	Dipperstick Cylinder Digging force	1248 lbs
	Hydraulic Volume Requirements	2 to 4 GPM
	Hydraulic Pressure Requirements	2100 PSI
	Backhoe Weight with Thumb & Bucket	790 lbs
L	Digging Depth (eight foot flat bottom)	47 inches
M	Overall Operating Height - Fully Raised	112 inches

Specifications may vary depending on tractor model and are subject to change without notification.
Tractors must be equipped with ROPS and seat belt that will provide better safety.

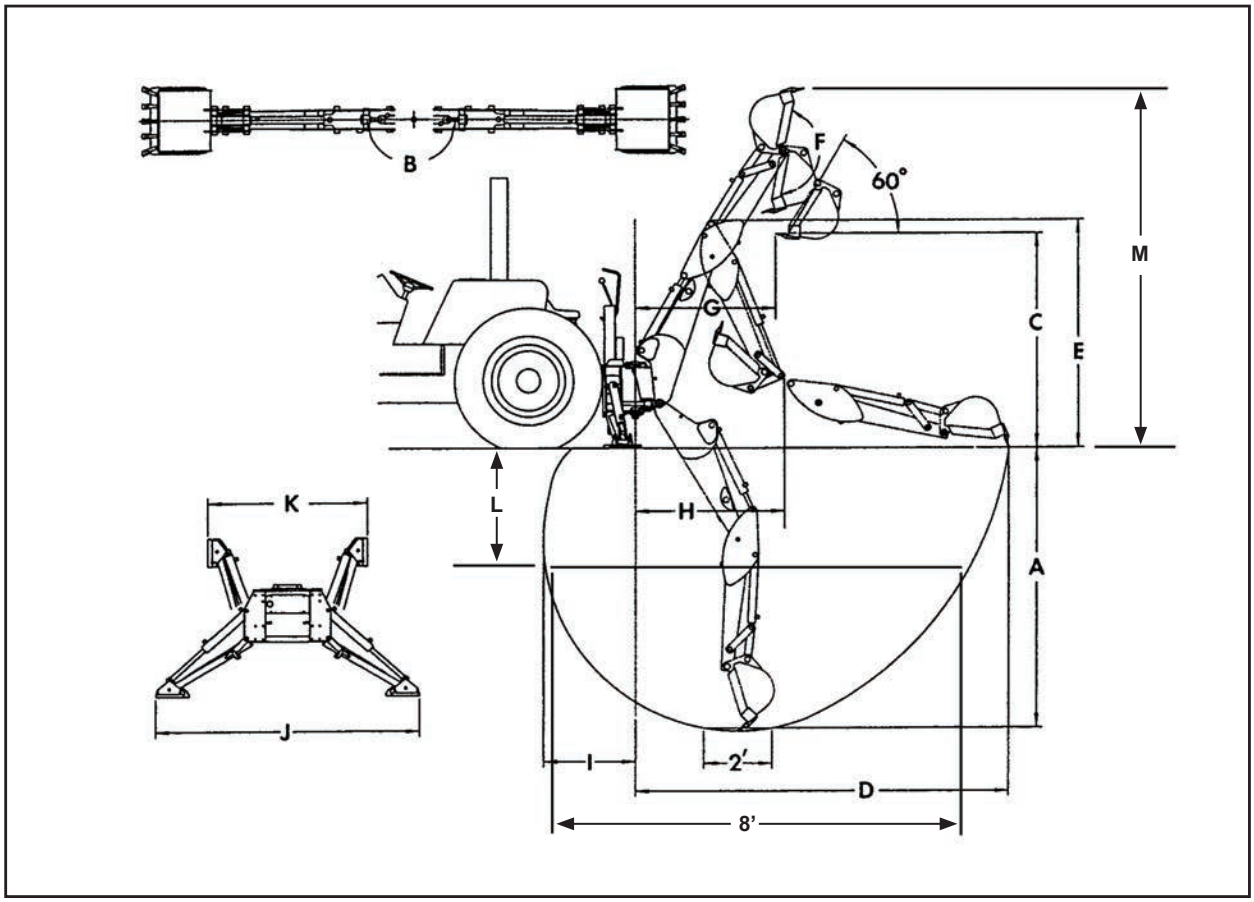


TABLE 2—TORQUE-TENSION RELATIONSHIPS FOR SAE GRADES 2, 5, AND 8

Nominal Size and Threads/in	Stress Area (1) in^2	Grade 2 Clamp Load lb	Grade 2 Torque Dry K = 0.2 in-lb	Grade 2 Torque Lub K = 0.15 in-lb	Grade 5 Clamp Load lb	Grade 5 Torque Dry K = 0.2 in-lb	Grade 5 Torque Lub K = 0.15 in-lb	Grade 8 Clamp Load lb	Grade 8 Torque Dry K = 0.2 in-lb	Grade 8 Torque Lub K = 0.15 in-lb
0.250-28	0.03637	1500	75.0	56.0	2319	116.0	87.0	3273	164	123
0.250-20	0.03182	1313	66.0	49.0	2029	101.0	76.0	2864	143	107
0.3125-24	0.05806	2395	150.0	112.0	3700	230.0	173.0	5225	327	245
0.3125-18	0.05243	2163	135.0	101.0	3342	209.0	157.0	4719	295	221
0.375-24	0.08783	3623	272.0	204.0	5600	420.0	315.0	7905	593	445
0.375-16	0.07749	3196	240.0	180.0	4940	370.0	278.0	6974	523	392
0.4375-20	0.11870	4896	428.0	321.0	7567	662.0	496.0	10683	935	700
0.4375-14	0.10630	4385	384.0	288.0	6777	593.0	445.0	9567	837	628
0.500-20	0.15995	6598	660.0	495.0	10197	1020.0	764.0	14396	1440	1080
0.500-13	0.14190	5853	585.0	439.0	9046	904.0	678.0	12771	1277	958

Nominal Size and Threads/in	Stress Area (1) in^2	Grade 2 Clamp Load lb	Grade 2 Torque Dry K = 0.2 ft-lb	Grade 2 Torque Lub K = 0.15 ft-lb	Grade 5 Clamp Load lb	Grade 5 Torque Dry K = 0.2 ft-lb	Grade 5 Torque Lub K = 0.15 ft-lb	Grade 8 Clamp Load lb	Grade 8 Torque Dry K = 0.2 ft-lb	Grade 8 Torque Lub K = 0.15 ft-lb
0.5625-18	0.20298	8373	78	59	12940	121	91	18268	171	128
0.5625-12	0.18195	7505	70	53	11600	109	82	16376	154	115
0.625-18	0.25595	10558	110	82	16317	170	127	23036	240	180
0.625-11	0.22600	9322	97	73	14407	150	113	20340	212	159
0.750-16	0.37296	15385	192	144	23776	297	223	33566	420	315
0.750-10	0.33446	13796	172	129	21532	269	201	30101	376	282
1.000-12	0.66304	—	—	—	42269	704	528	59674	995	746
1.000-8	0.60574	—	—	—	38616	644	483	54517	909	681

Tensile Strength	74,000 psi	120,000 psi	150,000 psi
Proof Load Stress	55,000 psi	85,000 psi	120,000 psi

Caution—The previously listed torque and resulting tension are provided as an advisory guide. Individual application discretion is recommended. The content has been presented as accurately as possible, but responsibility for its application lies with the user.

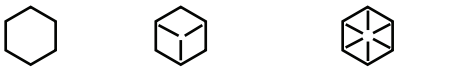
Note 1—The stress area of threaded series not included in Table 2 may be computed from the equation:

$$A_S = 0.7854\left(D - 0.9743/n\right)^2 \qquad \text{(Eq. 3)}$$

where:

A_s= Stress area in in^2
D = Diameter in inches
n = Threads per inch

SAE Bolt Head Identification



SAE Grade 2 (No Dashes) | SAE Grade 5 (3 Radial Dashes) | SAE Grade 8 (6 Radial Dashes)

Lubricating the bolts is the recommended method.

Lubed means cleaned dry bolts lubricated with standard medium viscosity machine oil.

Lubricate all contact areas of the bolts and washers.

TABLE 2—TORQUE-TENSION RELATIONSHIP FOR METRIC PROPERTY CLASSES

Major Diameter and Thread Pitch	Stress Area mm^2	Class 4.6 Clamp Load kN	Class 4.6 Torque Dry K = 0.2 N·m	Class 4.6 Torque Lub K = 0.15 N·m	Class 4.8 Clamp Load kN	Class 4.8 Torque Dry K = 0.2 N·m	Class 4.8 Torque Lub K = 0.15 N·m	Class 5.8 Clamp Load kN	Class 5.8 Torque Dry K = 0.2 N·m	Class 5.8 Torque Lub K = 0.15 N·m
3.0 x 0.5	5.03	0.85	0.50	0.40	1.17	0.70	0.50			
3.5 x 0.6	6.78	1.14	0.80	0.60	1.58	1.10	0.80			
4.0 x 0.7	8.78	1.48	1.20	0.90	2.04	1.60	1.20			
5.0 x 0.8	14.20	2.40	2.40	1.80	3.30	3.30	2.50	4.05	4.00	3.00
6.0 x 1.0	20.10	3.40	4.00	3.00	4.67	5.66	4.20	5.73	6.90	5.20
8.0 x 1.25	36.6	6.18	9.90	7.40	8.51	13.60	10.20	10.40	16.70	12.50
10.0 x 1.50	58.0	9.79	19.60	14.70	13.48	27.00	20.00	16.50	33.10	24.80
12.0 x 1.75	84.3	14.22	34.10	25.60	19.60	47.00	35.00	24.00	58.00	43.00
14.0 x 2.00	115.0	19.41	54.30	40.80	26.74	75.00	56.00	32.80	92.00	69.00
16.0 x 2.00	157.0									
20.0 x 2.50	245.0									
24.0 x 3.00	353.0									
30.0 x 3.50	561.0									
36.0 x 4.00	817.0									
Tensile Strength			400 MPa			420 MPa			520 MPa	
Proof Load Stress			225 MPa			310 MPa			380 MPa	

Major Diameter and Thread Pitch	Stress Area mm^2	Class 8.8 Clamp Load kN	Class 8.8 Torque Dry K = 0.2 N·m	Class 8.8 Torque Lub K = 0.15 N·m	Class 9.8 Clamp Load kN	Class 9.8 Torque Dry K = 0.2 N·m	Class 9.8 Torque Lub K = 0.15 N·m	Class 10.9 Clamp Load kN	Class 10.9 Torque Dry K = 0.2 N·m	Class 10.9 Torque Lub K = 0.15 N·m
3.5 x 0.6	6.78									
4.0 x 0.7	8.78									
5.0 x 0.8	14.20									
6.0 x 1.0	20.10									
8.0 x 1.25	36.6	16.50	26.40	19.80	17.80	28.50	21.40	22.80	36.50	27.30
10.0 x 1.50	58.0	26.10	52.20	39.20	28.30	56.60	42.40	36.10	72.20	54.20
12.0 x 1.75	84.3	37.90	91.00	68.00	41.10	99.00	74.00	52.50	126.00	94.00
14.0 x 2.00	115.0	51.80	145.00	109.00	56.10	157.00	118.00	71.60	200.00	150.00
16.0 x 2.00	157.0	70.60	226.00	170.00	76.50	245.00	184.00	97.70	313.00	235.00
20.0 x 2.50	245.0	110.20	441.00	331.00	119.40	478.00	358.00	152.50	610.00	458.00
24.0 x 3.00	353.0	158.90	762.00	572.00	172.10	826.00	620.00	220.00	1055.00	791.00
30.0 x 3.50	561.0	252.40	1515.00	1136.00	273.50	1641.00	1231.00	349.00	2095.00	1572.00
36.0 x 4.00	817.0	367.60	2647.00	1985.00	398.30	2868.00	2151.00	509.00	3662.00	2746.00
Tensile Strength			830 MPa			900 Pa			1040 Pa	
Proof Load Stress			600 MPa			650 Pa			830 Pa	

Caution—The previously listed torque and resulting tension are provided as an advisory guide. Individual application discretion is recommended. The content has been presented as accurately as possible, but responsibility for its application lies with the user.

Note 1—The stress area of threaded series not included in Table 2 may be computed from the equation:

$$As = 0.7854 (D - 0.9382 P)^2$$

where:

As = Stress area in mm^2
D = Diameter in mm
P = Pitch in mm

Metric Bolt Head Identification

Metric Grade 8.8

Metric Grade 10.9

Lubricating the bolts is the recommended method.

Lubed means cleaned dry bolts lubricated with standard medium viscosity machine oil.

Lubricate all contact areas of the bolts and washers.

be careful.. ....
avoid accidents