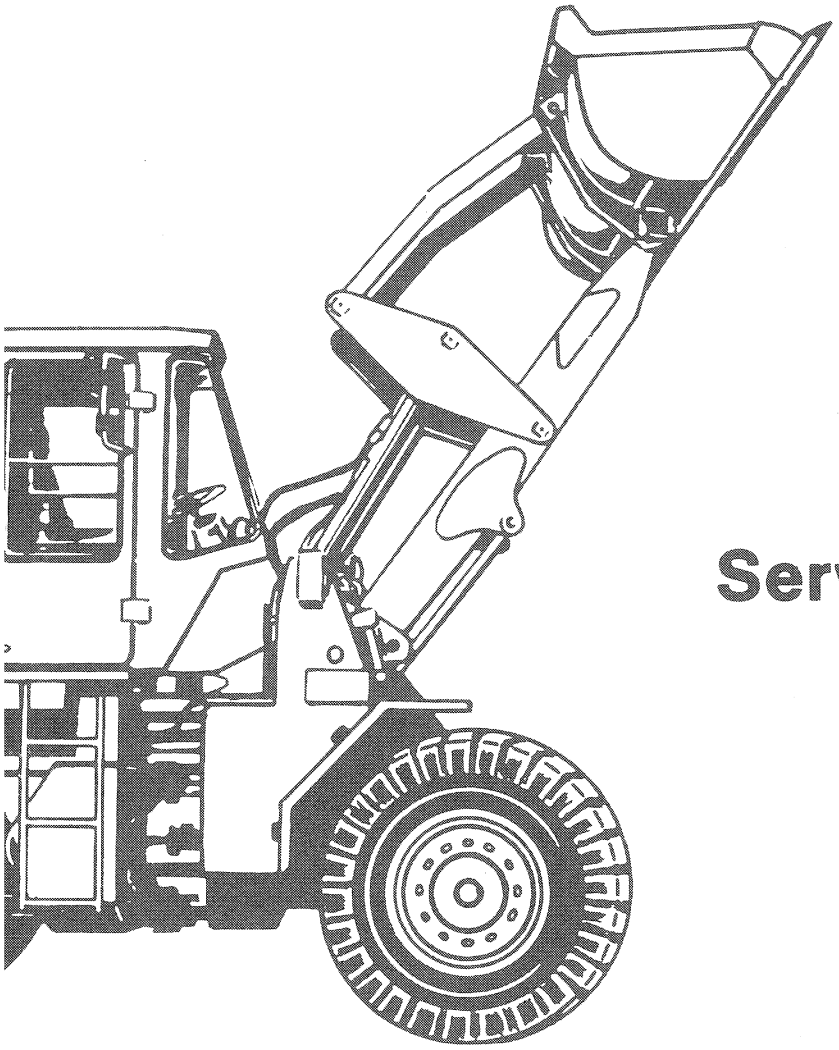
FIATALLIS

FR10
FR12
FR15

WHEEL LOADERS



Bucket and chassis

Service manual

Form 73149162 English
7–85

Reprinted

AVOID ACCIDENTS

Most accidents, whether they occur in industry, on the farm, at home or on the highway, are caused by the failure of some individual to follow simple and fundamental safety rules or precautions. For this reason MOST ACCIDENTS CAN BE PREVENTED by recognizing the real cause and doing something about it before the accident occurs.

Regardless of the care used in the design and construction of any type of equipment there are conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.

A careful operator is the best insurance against an accident.
The complete observance of one simple rule would prevent many thousand serious injuries each year.
That rule is:

Never attempt to clean, oil or adjust a machine while it is in motion.

WARNING

On machines having hydraulically, mechanically, and/or cable controlled equipment (such as shovels, loaders, dozers, scrapers, etc.) be certain the equipment is lowered to the ground before servicing, adjusting and/or repairing. If it is necessary to have the hydraulically, mechanically, and/or cable controlled equipment partially or fully raised to gain access to certain items, be sure the equipment is suitably supported by means other than the hydraulic lift cylinders, cable and/or mechanical devices used for controlling the equipment.

FR10,FR12,FR15

wheel loaders

service manual

bucket and chassis

S/N46C00101–UP
S/N58M00101–UP
S/N78Y00101–UP
S/N59U00101–UP
S/N79M00101–UP
S/N80U00101–UP

Form 73149162 English

⚠ WARNING

STUDY THE OPERATION AND MAINTENANCE INSTRUCTION MANUAL THROUGH BEFORE STARTING, OPERATING, MAINTAINING, FUELING OR SERVICING THIS MACHINE.

⚠ The Operation and Maintenance Instruction Manual provides the instructions and procedures for starting, operating, maintaining, fueling, shutdown and servicing that are necessary for properly conducting the procedures for overhaul of the related components outlined in this Service Manual.

⚠ This symbol is your safety alert sign. It means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

⚠ Read and heed all safety instructions carrying the signal words **WARNING** and **DANGER.**

⚠ Machine mounted safety signs have been color coded yellow with black borders and lettering for **WARNING** and red with white borders and lettering for **DANGER** points.

SAFETY RULES

GENERAL

Study the Operation and Maintenance Instruction Manual before starting, operating, maintaining, fueling, or servicing machine.

Read and heed all machine-mounted safety signs before starting, operating, maintaining, fueling or servicing machine.

Machine-mounted safety signs have been color coded yellow with black border and lettering for WARNING and red with white border and lettering for DANGER points.

Never attempt to operate the machine or its tools from any position other than seated in the operator's seat. Keep head, body, limbs, hands and feet inside operator's compartment at all times to reduce exposure to hazards outside the operator's compartment.

Do not allow unauthorized personnel to operate, service or maintain this machine.

Always check work area for dangerous features. The following are examples of dangerous work areas: slopes, overhangs, timber, demolitions, fire, high walls, dropoff, backfills, rough terrain, ditches, ridges, excavations, heavy traffic, crowded parking, crowded maintenance and closed areas. Use extreme care when in areas such as these.

An operator must know the machine's capabilities. When working on slopes or near dropoffs be alert to avoid loose or soft conditions that could cause sudden tipping or loss of control.

Do not jump on or off machine. Keep two hands and one foot, or two feet and one hand, in contact with steps, grab rails and handles at all times.

Do not use controls or hoses as handholds when climbing on or off machine. Hoses and controls are movable and do not provide a solid support. Controls also may be inadvertently moved causing accidental machine or equipment movement.

Keep operator's compartment, stepping points, grab-rails and handles clear of foreign objects, oil, grease, mud or snow accumulation to minimize the danger of slipping or stumbling. Clean mud or grease from shoes before attempting to mount or operate the machine.

Be careful of slippery conditions on stepping points, hand rails, and on the ground. Wear safety boots or shoes that have a high slip resistant sole material.

For your personal protection, do not attempt to climb on or off machine while machine is in motion.

Never leave the machine unattended with the engine running.

Always lock up machine when leaving it unattended. Return keys to authorized security. Heed all shutdown procedures of the Operation and Maintenance Instruction Manual. Always set the parking brake when leaving the machine for any reason.

Do not wear rings, wrist watches, jewelry, loose or hanging apparel, such as ties, torn clothing, scarves, unbuttoned, or unzipped jackets that can catch on moving parts. Wear proper safety equipment as authorized for the job. Examples: hard hats, safety shoes, heavy gloves, ear protectors, safety glasses or goggles, reflector vests, or respirators. Consult your employer for specific safety equipment requirements.

Do not carry loose objects in pockets that might fall unnoticed into open compartments.

Do not use machine to carry loose objects by means other than attachments for carrying such objects.

DO NOT CARRY RIDERS unless the machine is equipped for carrying people to reduce personal exposure to being thrown off.

Do not operate machinery in a condition of extreme fatigue or illness. Be especially careful towards the end of the shift.

Roll Over Protective Structures are required on wheel loaders, dozer tractors, track type loaders, graders and scrapers by local or national requirements. DO NOT operate this machine without a Roll over Protective Structure.

Do not operate a machine without a falling object protective structure (FOPS).

Do not operate this machine without a rear canopy screen when machine is equipped with rear mounted towing winch.

Seat belts are required to be provided with roll over protective structures or roll protection cabs by local or national regulations. Keep the safety belt fastened around you during operation.

Where noise exposure exceeds 90 dBA for 8 hours, wear authorized ear protective equipment per local or national requirements that apply.

Keep clutches and brakes on machine and attachments such as power control units, winches and master clutches adjusted according to Operation and Maintenance Instruction Manuals of the manufacturers at all times. DO NOT adjust machine with engine running except as specified.

Do not operate a machine with brakes out of adjustment. See the Operation and Maintenance Instruction Manual.

Move carefully when under, in or near machine or implements. Wear required protective equipment, such as hard hat, safety glasses , safety shoes, ear protectors.

To move a disabled machine, use a trailer or low boy truck if available. If towing is necessary, provide warning signals as required by local rules and regulations and follow Operation and Maintenance Instruction Manual recommendations. Load and unload on a level area that gives full support to the trailer wheels. Use ramps of adequate strength, low angle and proper height. Keep trailer bed clean of clay, oil and all materials that become slippery. Tie machine down securely to truck or trailer bed and block tracks (or wheels) as required by the carrier.

To prevent entrapment in cabs or mounted enclosures, observe and know the mechanics of alternate exit routes.

On machines equipped with suction radiator fans, be sure to periodically check all engine exhaust parts for leaks as exhaust gases are dangerous to the operator. Keep a vent open to outside air at all times when operating within a closed cab.

STARTING FLUID IS FLAMMABLE. Follow the recommendations as outlined in the Operation and Maintenance Instruction Manual and as marked on the containers. Store containers in cool, well-ventilated place secure from unauthorized personnel. DO NOT PUNCTURE OR BURN CONTAINERS. Follow the recommendations of the manufacturer for storage and disposal.

Wire rope develops steel slivers. Use authorized protective equipment such as heavy gloves, safety glasses when handling.

SAFETY RULES

OPERATION

Before starting machine, check, adjust and lock the operator's seat for maximum comfort and control of the machine.

DO NOT START OR OPERATE AN UNSAFE MACHINE. Before working the machine, be sure that any unsafe condition has been satisfactorily remedied. Check brakes, steering and attachment controls before moving. Advise the proper maintenance authority of any malfunctioning part or system. Be sure all protective guards or panels are in place, and all safety devices provided are in place and in good operating condition.

Check instruments at start-up and frequently during operation.

Do not run the engine of this machine in closed areas without proper ventilation to remove deadly exhaust gases.

Be sure exposed personnel in the area of operation are clear of the machine before moving the machine or its attachments. WALK COMPLETELY AROUND machine before mounting. Sound horn. Obey flagman. safety signals and signs.

Know the principles of cross steering of crawler tractors. Read section in Operation and Maintenance Instruction Manual on cross steering.

Keep engine exhaust system and exhaust manifolds clear of combustible material. Equip machine with screens and guards when working under conditions of flying combustible material.

If engine has a tendency to stall for any reason under load or idle, report this for adjustment to a proper maintenance authority immediately. Do not continue to operate machine until condition has been corrected.

Never use bucket as a man-lift.

Use recommended bucket for machine and material loadability and heaping characteristics of material, terrain, and other pertinent job conditions.

Avoid abrupt starts and stops when transporting a loaded bucket.

Inspect your seat belt webbing and hardware at least twice a year for signs of fraying, wear or other weakness that could lead to failure.

Use only designated towing or pulling attachment points. Use care in making attachment. Be sure pins and locks as provided are secure before pulling. Stay clear of drawbars, cables or chains under load.

When pulling or towing through a cable or chain, do not start suddenly at full throttle. Take up slack carefully. Guard against kinking chains or cables. Inspect carefully for flaws before using. Do not pull through a kinked chain or cable due to the high stresses and possibility of failure of the kinked area. Aways wear heavy gloves when handling chain or cable.

Be sure cables are anchored and the anchor point is strong enough to handle the expected load. Keep exposed personnel clear of anchor point and cable or chain. DO NOT PULL OR TOW UNLESS OPERATORS COMPARTMENTS OF MACHINES INVOLVED ARE PROPERLY GUARDED AGAINST POTENTIAL CABLE OR CHAIN BACKLASH.

During operation always carry ripper in full raised position when not in use and lower to ground when parked.

When counterweights have been provided, do not work machine if they have been removed unless their equivalent weight has been replaced. See the Operation and Maintenance Instruction Manual.

When operating a machine know what clearances will be encountered, overhead doors, wires, pipes, aisles, roadways; also the weight limitations of ground, floor, and ramps.

Know bridge and culvert load limits and do not exceed them. Know machine's height, width, and weight. Use a signal person when clearance is close.

Be sure that the exact location of gas lines, utility lines, sewers, overhead and buried power lines, and other obstructions or hazards are known. Such locations should be precisely marked by the proper authorities to reduce the risk of accidents. Obtain shut-down or relocation of any such facilities before starting work, if necessary.

Be certain to comply with all local, state, and federal regulations regarding working in the vicinity of power lines.

When roading find out what conditions are likely to be met - clearances, congestion, type of surface, etc. Be aware of fog, smoke or dust elements that obscure visibility.

When backing, always look to where the machine is to be moved. Be alert to the position of exposed personnel. DO NOT OPERATE if exposed personnel enter the immediate work area.

Never travel a machine on a job site, in a congested area, or around people without a signal person to guide the operator.

In darkness, check area of operation carefully before moving in with machine. Use all lights provided. Do not move into area of restricted visibility.

Maintain clear vision of all areas of travel or work. Keep cab windows clean and repaired. Carry blade low for maximum visibility while traveling. Obtain and use fan blast deflectors where tractors are used as pusher tractors in tandem.

Transport a loaded bucket with the bucket as far tipped back and in as low a position as possible for maximum visibility, stability, and safest transport of the machine. Carry it at a proper speed for the load and ground conditions.

Carry the bucket low when traveling with a load.

Maintain a safe distance from other machines. Provide sufficient clearance for ground and visibility conditions. Yield right-of-way to loaded machines.

Avoid going over obstacles such as rough terrain, rocks, logs, curbs, ditches, ridges, and railroad tracks whenever possible. When obstructions must be crossed, do so with extreme care at an angle if possible. Reduce speed - down-shift. Ease up to the breakover point - pass the balance point slowly on the obstruction and ease down on the other side.

Cross gullies or ditches at an angle with reduced speed after insuring ground conditions will permit a safe traverse.

Be alert to soft ground conditions close to newly constructed walls. The fill material and weight of machine may cause the wall to collapse under the machine.

Operate at speeds slow enough to insure complete control at all times. Travel slowly over rough ground, on slopes or near dropoffs, in congested areas or on ice or slippery surfaces.

SAFETY RULES

Be alert to avoid changes in traction conditions that could cause loss of control. DO NOT drive on ice or frozen ground conditions when working the machine on steep slopes or near dropoffs.

Keep the machine well back from the edge of an excavation.

Be especially careful when traveling up or down slopes. Position the bucket in such a way as to provide a possible anchorage on the ground in case of a slide.

When proceeding across a hillside proceed slowly. Never turn sharply uphill or downhill.

Avoid sidehill travel whenever possible. Drive up and down the slope. Should the machine start slipping sideways on a grade, turn it immediately downhill.

In steep downhill operation, do not allow engine to overspeed. Select proper gear before starting downgrade.

There is no substitute for good judgement when working on slopes.

The grade of slope you should attempt will be limited by such factors as condition of the ground, load being handled, the type of machine, speed of machine and visibility.

NEVER COAST the machine down grades and slopes with the transmission in neutral on power shift machines, or clutch disengaged on manually shifted machines.

To reduce the danger of an uncontrolled machine, choose a gear speed before proceeding down grade that will hold machine to proper speeds for conditions.

Operating in virgin rough terrain that includes previously mentioned hazards is called pioneering. Be sure you know how this is done. Danger from falling branches and upturning roots is acute in these areas.

When pushing over trees, the machine must be equipped with proper overhead guarding. Never allow a machine to climb up on the root structure particularly while the tree is being felled. Use extreme care when pushing over any tree with dead branches.

Avoid brushpiles, logs or rocks. DO NOT DRIVE THE MACHINE ONTO BRUSHPILES, LOGS, LARGE ROCKS or other surface irregularities that break traction with the ground especially when on slopes or near dropoffs.

Avoid operating equipment too close to an overhang or highwall either above or below the machine. Be on the lookout for caving edges. falling objects and slides. Beware of concealment by brush and undergrowth of these dangers.

Park in a non-operating and non-traffic area or as instructed. Park on firm level ground if possible. Where not possible, position machine at a right angle to the slope, making sure there is no danger of uncontrolled sliding movement. Set the parking brake.

Never park on an incline without carefully blocking the machine to prevent movement.

If parking in traffic lanes cannot be avoided, provide appropriate flags, barriers, flares and warning signals as required. Also provide advance warning signals in the traffic lane for approaching traffic.

Move the machine away from pits, trenches, overhangs and overhead power lines before shutting down for the day.

When stopping operation of the machine for any reason, always return the transmission or hydrostatic drive control to neutral and engage the control lock to secure the machine for a safe start up. Set parking brake, if so equipped.

Never lower attachments or tools from any position other than seated in operator's seat. Sound the horn. Make sure the area near the attachment is clear. Lower the attachment slowly. DO NOT USE float position to lower hydraulic equipment.

Always before leaving the operator's seat and after making certain all people are clear of the machine, slowly lower the attachments or tools flat to the ground in a positive ground support position. Move any multipurpose tool to positive closed position. Return the controls to hold. Place transmission control in neutral and move engine controls to off position. Engage all control locks, set parking brake, and open and lock the master (key, if so equipped) switch. Consult Operation and Maintenance Instruction Manual.

Always follow the shut-down instructions as outlined in the Operation and Maintenance Instruction Manual.

MAINTENANCE

Do not perform any work on equipment that is not authorized. Follow the Maintenance or Service Manual Procedures.

Machine should not be serviced with anyone in the operator's seat unless they are qualified to operate the machine and are assisting in the servicing.

Shut off engine and disengage the Power Take-Off lever if so equipped before attempting adjustments or service.

Always turn the master switch (key switch if so equipped) to the off position before cleaning, repairing, or servicing and when parking machine to forestall unintended or unauthorized starting.

Disconnect batteries and TAG all controls according to local or national requirements to warn that work is in progress.Block the machine and all attachments that must be raised per local or national requirements.

Never lubricate, service or adjust a machine with the engine running, except as called for in the Operation and Maintenance Instruction Manuals. Do not wear loose clothing or jewelry near moving parts.

Do not run engine when refueling and use care if engine is hot due to the increased possibility of a fire if fuel is spilled.

Do not smoke or permit any open flame or spark near when refueling, or handling highly flammable materials.

Always place the fuel nozzle against the side of the filler opening before starting and during fuel flow. To reduce the chance of a static electricity spark, keep contact until after fuel flow is shut off.

Do not adjust engine fuel pump when the machine is in motion.

Never attempt to check or adjust fan belts when engine is running.

When making equipment checks that require running of the engine, have an operator in the operator's seat at all times with the mechanic in sight. Place the transmission in neutral and set the brakes and lock. KEEP HANDS AND CLOTHING AWAY FROM MOVING PARTS.

SAFETY RULES

Avoid running engine with open unprotected air inlets. If such running is unavoidable for service reasons, place protective screens over all inlet openings before servicing engine.

Do not place head, body, limbs, feet, fingers, or hands near rotating fan or belts. Be especially alert around a pusher fan.

Keep head, body, limbs, feet, hands, and fingers away from bucket, blade or ripper when in raised position.

If movement of an attachment by means of machine's hydraulic system or winches is required for service or maintenance, do not raise or lower attachments from any position other than when seated in the operator's seat. Before starting machine or moving attachments or tools, set brakes, sound horn and call for an all clear. Raise attachments slowly.

Never place head, body, limbs, fingers, feet or hands into an exposed portion between uncontrolled or unguarded scissor points of machine without first providing secure blocking.

Never align holes with fingers or hands - Use the proper aligning tool.

Disconnect batteries before working on electrical system or repair work of any kind.

Check for fuel or battery electrolyte leaks before starting service or maintenance work. Eliminate leaks before proceeding.

BATTERY GAS IS HIGHLY FLAMMABLE. Leave battery box open to improve ventilation when charging batteries. Never check charge by placing metal objects across the posts. Keep sparks or open flame away from batteries. Do not smoke near battery to guard against the possibility of an accidental explosion.

Do not charge batteries in a closed area. Provide proper ventilation to guard against an accidental explosion from an accumulation of explosive gases given off in the charging process.

Be sure to connect the booster cables to the proper terminals (+ to +) and (− to −) at both ends. Avoid shorting clamps. Follow the Operation and Maintenance Instruction Manual procedure.

Due to the presence of flammable fluid, never check or fill fuel tanks, storage batteries, or use starter fluid near lighted smoking materials or open flame or sparks.

Rust inhibitors are volatile and flammable. Prepare parts in well ventilated place. Keep open flame away - DO NOT SMOKE. Store containers in a cool well-ventilated place secured against unauthorized personnel.

Do not use an open flame as a light source to look for leaks or for inspection anywhere on the machine.

DO NOT pile oily or greasy rags - they are a fire hazard. Store in a closed metal container.

Never use gasoline or solvent or other flammable fluid to clean parts. Use authorized commercial, non-flammable, non-toxic solvents.

Never place gasoline or diesel fuel in an open pan.

Shut off engine and be sure all pressure in system has been relieved before removing panels, housings, covers, and caps. See Operation and Maintenance Instruction Manual.

Do not remove hoses or check valves in the hydraulic system without first removing load and relieving pressure on the supporting cylinders.

Turn radiator cap slowly to relieve pressure before removing. Add coolant only with engine stopped or idling if hot. See Operation and Maintenance Instruction Manual.

Fluid escaping under pressure from a very small hole can almost be invisible and can have sufficient force to penetrate the skin. Use a piece of cardboard or wood to search for suspected pressure leaks. DO NOT USE HANDS. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

Never use any gas other than dry nitrogen to charge accumulators. See Operation and Maintenance Instruction Manual.

When making pressure checks use the correct gauge for expected pressure. See the Operation and Maintenance Instruction Manual or Service Manuals for guidance.

For field service, move machine to level ground if possible and block machine. If work is absolutely necessary on an incline, block machine and its attachments securely. Move the machine to level ground as soon as possible.

Brakes are inoperative when manually released for servicing. Provision must be made to maintain control of the machine by blocking or other means.

Block all wheels before bleeding or disconnecting any brake system lines and cylinders.

Never use makeshift jacks when adjusting track tension. Follow the Undercarriage Service Manual.

Know your jacking equipment and its capacity. Be sure the jacking point used on the machine is appropriate for the load to be applied. Be sure the support of the jack at the machine and under the jack is appropriate and stable. Any equipment up on a jack is dangerous. Transfer load to appropriate blocking as a safety measure before proceeding with service or maintenance work according to local or national requirements.

Always block with external support any linkage or part on machine that requires work under the raised linkage, parts, or machine per local or national requirements. Never allow anyone to walk under or be near unblocked raised equipment. Avoid working or walking under raised blocked equipment unless you are assured of your safety.

When servicing or maintenance requires access to areas that cannot be reached from the ground, use a ladder or step platform that meets local or national requirements to reach the service point. If such ladders or platforms are not available, use the machine handholds and steps as provided. Perform all service or maintenance carefully.

Shop or field service platforms and ladders used to maintain or service machinery should be constructed and maintained according to local or national requirements.

Lift and handle all heavy parts with a lifting device of proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided. Watch out for people in the vicinity.

SAFETY RULES

In lifting and handling heavy parts, slings must be of adequate strength for the purpose intended and must be in good condition.

Handle all parts with extreme care. Keep hands and fingers from between parts. Wear authorized protective equipment such as safety glasses, heavy gloves, safety shoes.

When using compressed air for cleaning parts use safety glasses with side shields or goggles. Limit the pressure to 207 kPa (30psi) according to local or national requirements.

Wear welders protective equipment such as dark safety glasses, helmets, protective clothing, gloves and safety shoes when welding or burning. Wear dark safety glasses near welding. DO NOT LOOK AT ARC WITHOUT PROPER EYE PROTECTION.

Wear proper protective equipment such as safety goggles or safety glasses with side shields, hard hat, safety shoes, heavy gloves when metal or other particles are apt to fly or fall.

Use only grounded auxiliary power source for heaters, chargers, pumps and similar equipment to reduce the hazards of electrical shock.

Keep maintenance area CLEAN and DRY. Remove water or oil slicks immediately.

Remove sharp edges and burrs from reworked parts.

Be sure all mechanics tools are in good condition. DO NOT use tools with mushroomed heads. Always wear safety glasses with side shields.

Do not strike hardened steel parts with anything other than a soft iron or non-ferrous hammer.

FOREWORD

Always furnish serial number if making an inquiry to dealer or factory about this machine.

Many equipment owners employ the Dealer's Service Department for all work other than routine lubrication and minor service. This practice is encouraged, as our Dealers are well informed and equipped to render efficient service by factory trained mechanics.

Illustrations show standard and optional items.

IMPORTANT

The information in this manual was current at the time of publication. It is our policy to constantly improve our product and to make available additional optional items. These changes may affect procedures outlined in this manual. If variances are observed, verify the information through your Dealer.

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1.1 DESCRIPTION

1.1.1
The loaders consist of three major components that are of welded construction. Front frame (tool module); rear frame frame (power module); and the platform.

1.2 FRONT FRAME

1.2.2

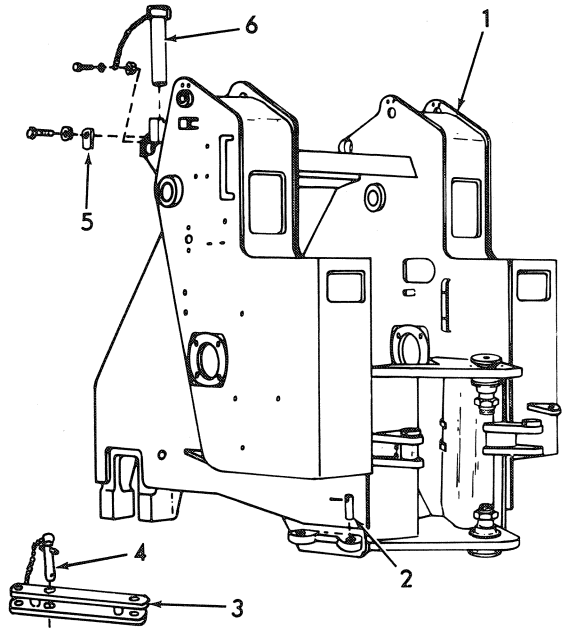


FIG.1 FRONT FRAME(FR10) T-81462

1.Frame	4.Lock pin assy.
2.Pin	5.Plate
3.Lock bar	6.Boom support pin

Located in or on the front frame of the FR10, Fig.1, are the boom, lift and dump cylinders, front axle assembly and boom support pin (if the loader is so equipped).

1.2.3

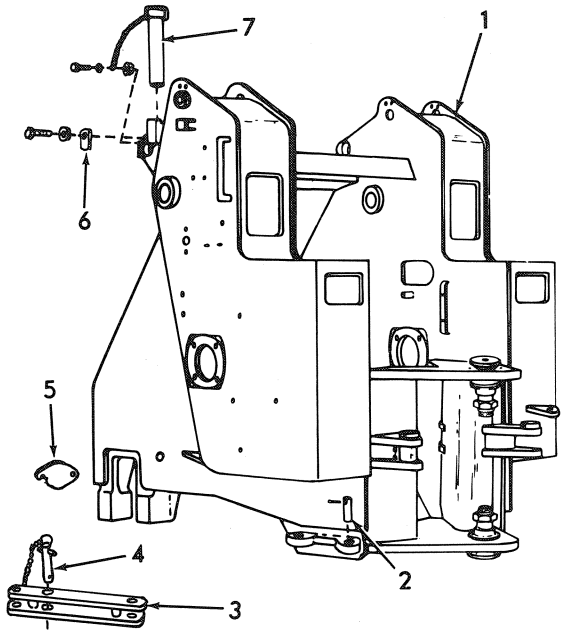


FIG.2 FRONT FRAME(FR12) T-81462

1.Frame	4.Lock pin assy.
2.Pin	5.Cover
3.Lock bar	6.Plate
	7.Boom support pin

Located in or on the front frame of the FR12,Fig.2, are the boom, lift and dump cylinders, front axle assembly, boom support pin(if the loader is so equipped), power cluster, brake fluid reservoir,air tank and an access cover.

1.2.4
Located in or on the front frame of the FR15, Fig.3, are the boom, lift and dump cylinders, front axle assembly, boom support pin (if the boader is so equipped), presssure converter, brake fluid reservoir, air tank and an access cover.

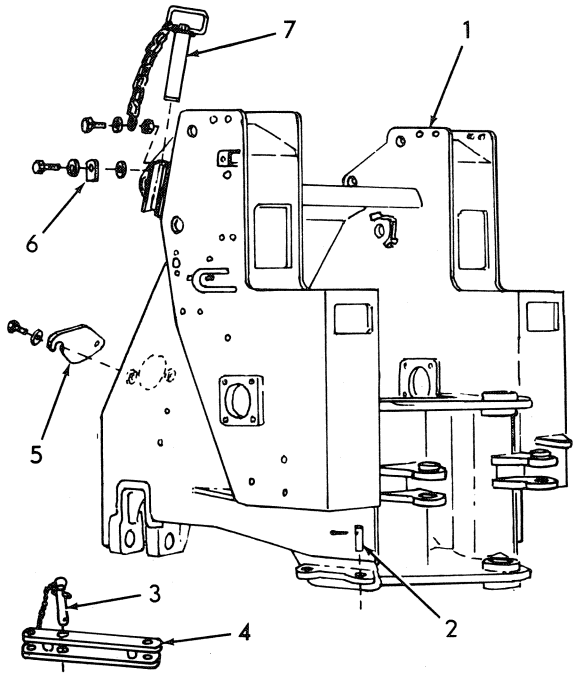


FIG.3 FRONT FRAME(FR15) T-83264

1.Frame
2.Pin
3.Lock pin assy.
4.Lock bar
5.Access cover
6.Plate
7.Boom support pin

1.3 REAR FRAME

1.3.1
The FR10,Fig.4,rear frame has the upper pivot pin bushing pressed in. It also has the two axle support bushings pressed in. Located on or in the rear frame are the draw bar pin, rear axle fuel tank, batteries, three air tanks, radiator support, radiator, engine, transmission and the platform.

1.3.2
The FR12,Fig.4,rear frame has the upper pivot pin bushing pressed in. It also has the two axle support bushings pressed in. Located on or in the rear frame are; the draw bar pin, rear axle, fuel tank, batteries, one air tank, power cluster, brake fluid reservoir, radiator support, radiator, engine, transmission and the platform.

1.3.3
The FR15,Fig.5,rear frame has three pivot pin bushings pressed in. It also has the two axle support bushing pressed.Located on or in the rear frame are; the draw bar pin, rear axle, fuel tank, batteries, one air tank, power cluster, brake fluid reservoir,radiator support, radiator, engine, transmission, support plate and the platform.

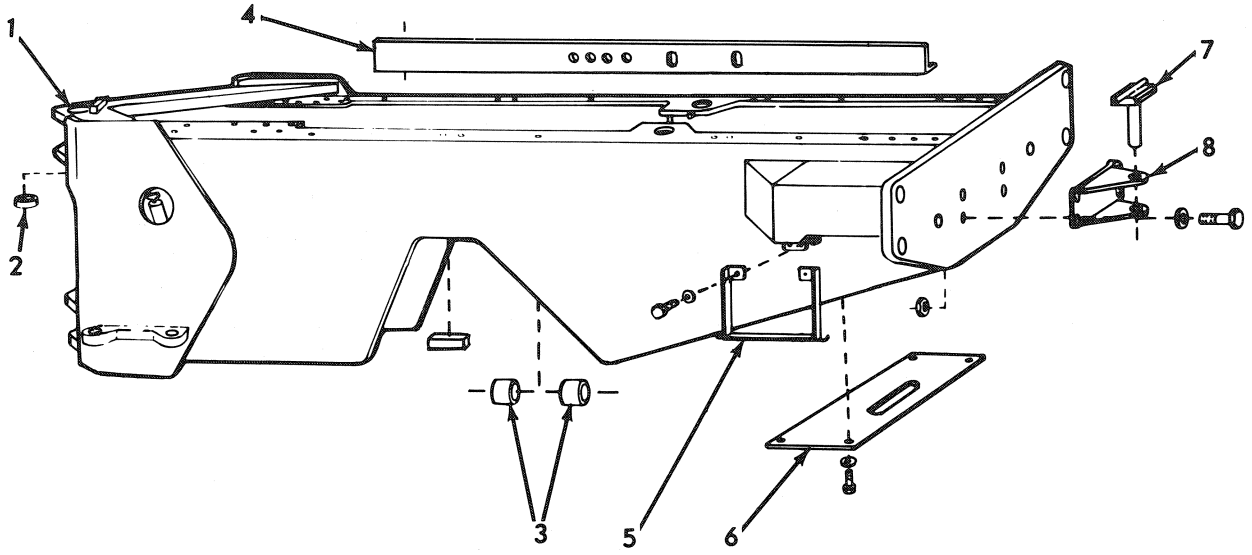


FIG. 4 REAR FRAME, FR10, FR12 T-84237

1.Rear frame
2.Pivot pin bushing
3.Axle support bushings
4.Plate
5.Service step
6.Cover plate
7.Draw bar pin
8.Draw bar

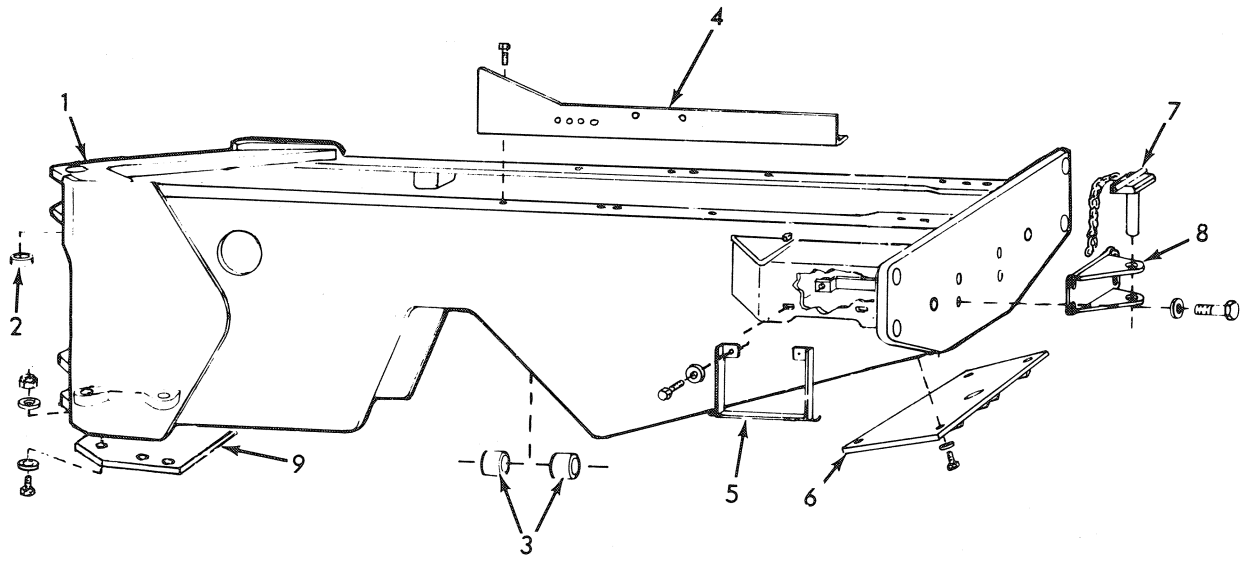


FIG. 5 REAR FRAME, FR15 T-81463

1.Rear frame
2.Pivot pin bushing
3.Axle support bushings
4.Plate
5.Service step
6.Cover plate
7.Draw bar pin
8.Draw bar
9.Support plate

1.4 PLATFORM

1.4.1
The platforms, Figs. 6,7 and 8 are utilized to provide a work station for the operator. Located in or on the platform are the instrument panels, steering column, brake pedals, engine throttle pedal, transmission control lever, boom and bucket control levers, hydraulic tank,hydraulic control valve,seat, horn button and parking brake lever.

1.5 LOCKING BAR

1.5.1
The locking bar, Figs. 1, 2 and 3 is attached to the rear section when not in use. The bar is swung into position and pinned into place to prevent loader articulation while maintenance is performed. The bar can be used to lock the tractor in a straight ahead position. Pins provided can be used to lock the loader at an approximate 45° angle to the left only.

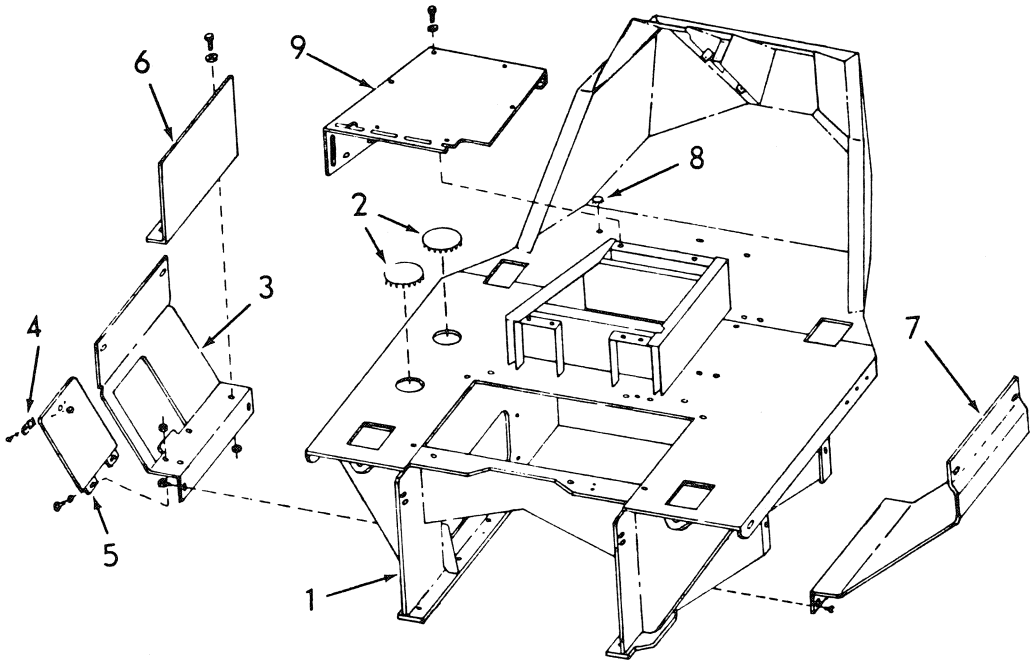


FIG. 6 FR10 PLATFORM T-81450

1.Platform
2.Access plugs
3.Cover plate
4.Latch
5.Access cover
6.Baffle
7.Cover plate
8.Plug
9.Seat support plate

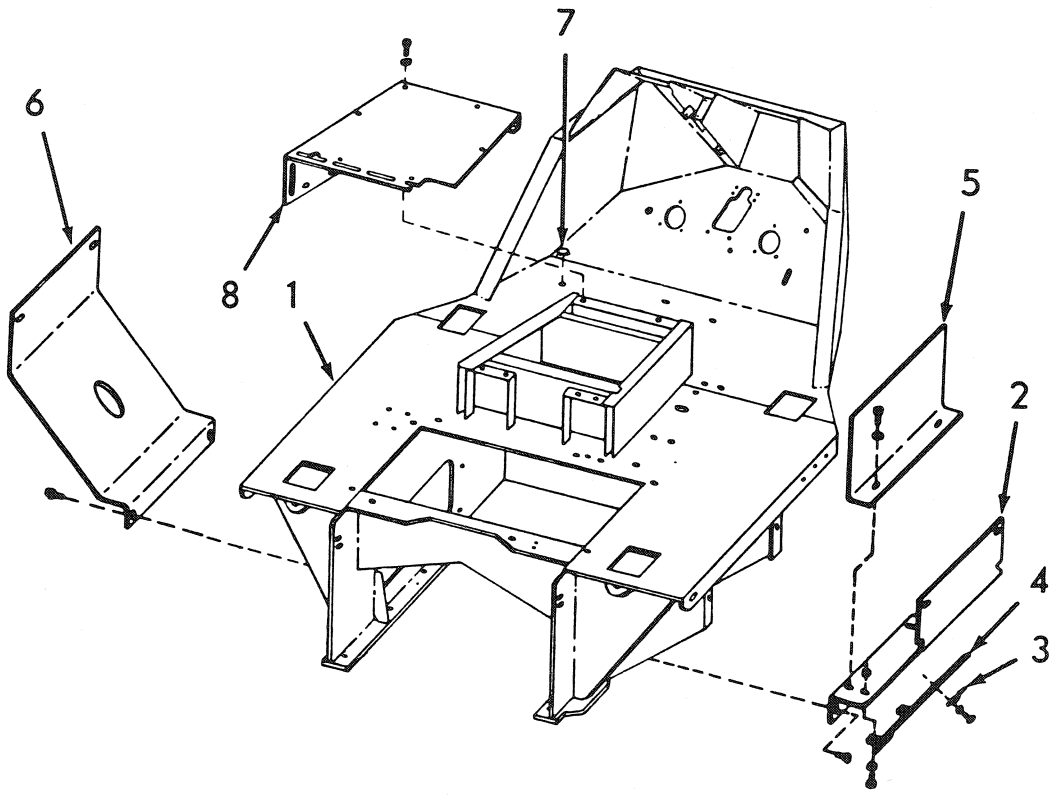


FIG. 7 FR12 PLATFORM T-81475

1. Platform
2. Cover
3. Latch
4. Cover
5. Plate
6. Cover plate
7. Plug
8. Seat support plate

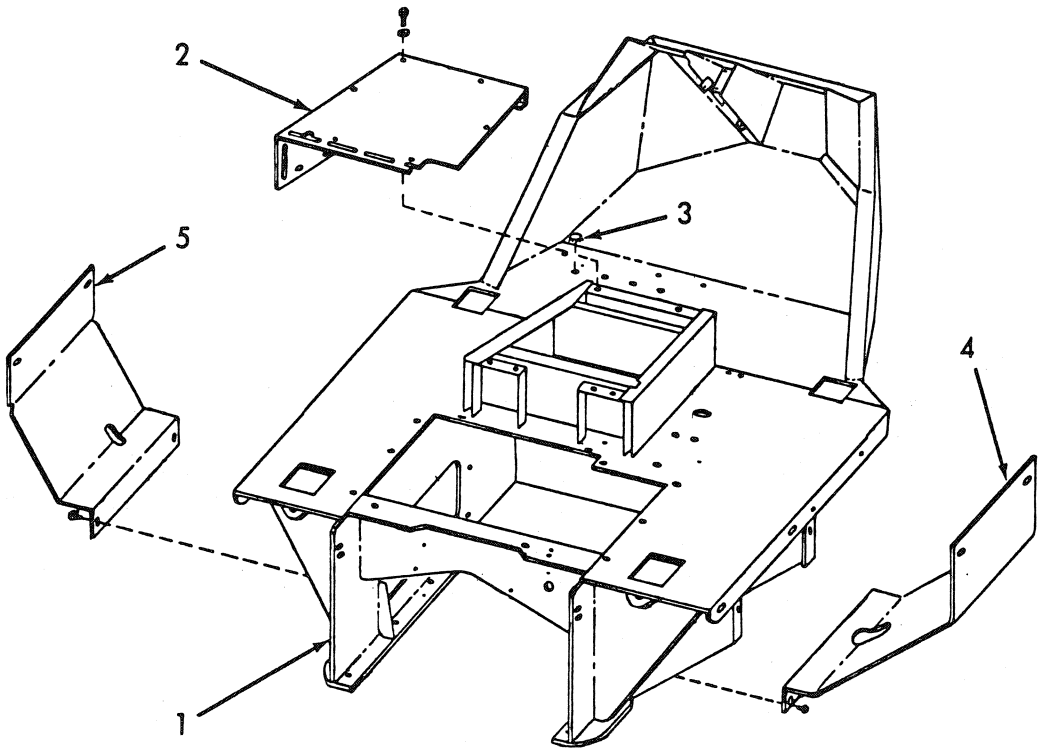


FIG. 8 FR15 PLATFORM T-81450

1.Platform
2.Seat support plate
3.Plug
4.Cover plate
5.Cover plate

2.1 INSPECTION OF BUCKET

==========

⚠ WARNING -Do not work under or near an unblocked or unsupported linkage, parts or machine.

==========

⚠ WARNING -Wear welders protective equipment such as dark safety glasses, helmets, protective clothing, gloves and safety shoes when welding or burning. Wear dark safety glasses near welding."Do not look at the arc without proper eye protection."

2.2.1
Clean and inspect bucket periodically for cracked welds,bending, misalignment and/or broken cutting edges. Should any of these conditions be found, they should be corrected to prevent any additional damage. Some bucket damage can be corrected without removing the bucket.

2.2 REMOVAL OF BUCKET

==========

⚠ WARNING -Before moving machine or attachments be sure exposed people in the area are clear of the machine. Walk completely around machine before mounting. Sound horn.

==========

⚠ WARNING -Never attempt to operate machine or attachment except when seated in the operator's seat. Keep head, body, limbs, hands and feet inside the operator's compartment to reduce exposure to hazards outside the operator's compartment.

==========

⚠ WARNING -Warn all people who may be servicing or working around machine before starting engine.

==========

⚠ WARNING -Do not run engine of this machine in closed areas without proper ventilation to remove deadly exhaust gases.

==========

⚠ WARNING -Keep people clear of attachments and tools while in raised position, to prevent possible injury.

==========

⚠ WARNING -Observe all start up and shut down procedures and WARNINGS listed in the Operation and Maintenance Instruction Manual.

==========

⚠ WARNING -Lift and handle all heavy parts with a lifting device of proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided. Watch out for people in the vicinity.

==========

⚠ WARNING -It is unsafe to strike hardened steel parts with anything other than a soft iron or non-ferrous hammer. When installing or removing such parts wear safety glasses with side shields and heavy gloves, etc., to reduce the possibility of injury.

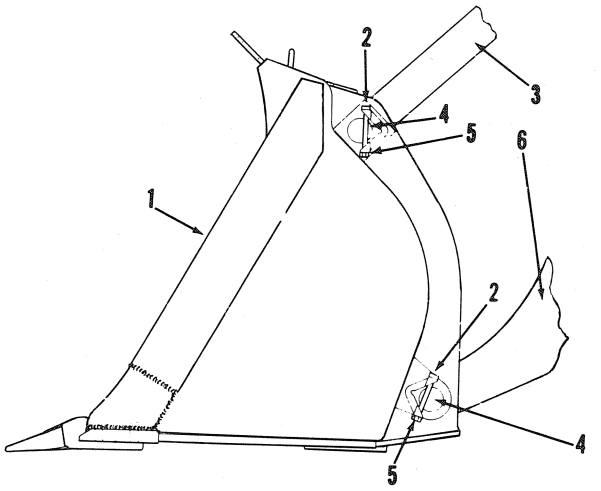


FIG.9 GENERAL PURPOSE BUCKET T-78634

1. Bucket
2. Capscrew
3. Dump link
4. Pivot pin
5. Locknut
6. Boom

2.2.1
Operate loader and position bucket in work area.Lower bucket so bucket bottom sheet is flat on ground. Blocking maybe required on rear of bucket.

2.2.2
Place bucket and boom control levers in the neutral position. Engage control lever lock and stop engine.

2.2.3
Remove all four bucket pivot pin, retaining capscrew,Fig.9(2) and locknuts (5).

2.2.4
Attach hoist to bucket end of one dump link(3). Remove bucket pivot pin(4) and lower dump link. Use same procedure for removal of the other dump link. Start engine,disengage control lever lock and fully retract dump cylinder rods.Engage control lever lock and stop engine.

2.2.5
Remove pivot pins(4) securing boom(6)to bucket. Start engine and back loader away from bucket.

2.3 REPAIR OF BUCKET

==========

⚠ WARNING -Do not work under or near an unblocked or unsupported linkage, parts or machine.

==========

⚠ WARNING -Lift and handle all heavy parts with a lifting device or proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided. Watch out for people in the vicinity.

==========

⚠ WARNING -Wear welders protective equipment such as dark safety glasses, helments, protective clothing, gloves and safety shoes when welding or burning. Wear dark safety glasses near welding."Do not look at the arc without proper eye protection."

2.3.1
If the bucket has been damaged due to extreme working conditions, it may be practical to reinforce damaged areas. The bucket should be checked for proper alignment and straightened as necessary.

2.3.2
Remove bucket tooth assembly if bucket is equipped with bolt on type.If shanks are welded to cutting edge,remove teeth then remove shank by cutting welds.

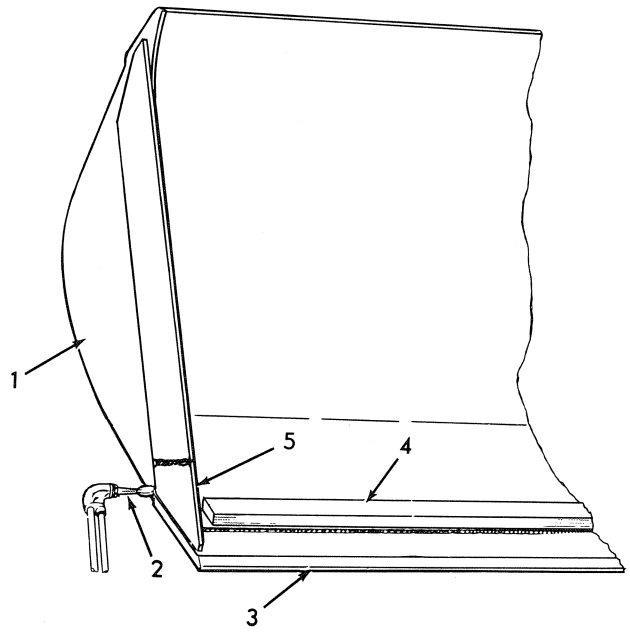


FIG.10 REMOVING CUTTING EDGE T-78635

1.Bucket
2.Cutting torch
3.Cutting edge
4. Guide bar
5. Corner bit

2.3.3
Place guide along old cutting edge, Fig.10, and using an air carbon arc, remove the cutting edge. Turn bucket over and remove weld at the rear of the cutting edge. Remove corner bits from bucket.

2.3.4
Material temperature to be 10°C (50°F) minimum. Smooth the cut surface and place a new cutting edge or edges in position and align. Then tack weld in place.

Position corner bits in place and tack weld. Preheat all weld areas to 205°C-235°C (400°-450°F) and weld while hot. Use E-7018(ACS-76) or E70T-1 (ACS-77) for all welds,except where two piece edges butt together in center of bucket (Fig.11). Use AWS-E110T(ACS-79)and fill grooves on both sides. Cover pass welds with MANJET or LINCOR-M (ACS-90) to provide a hard surface. After each weld pass,peen weld to remove slag and relieve welding stress.

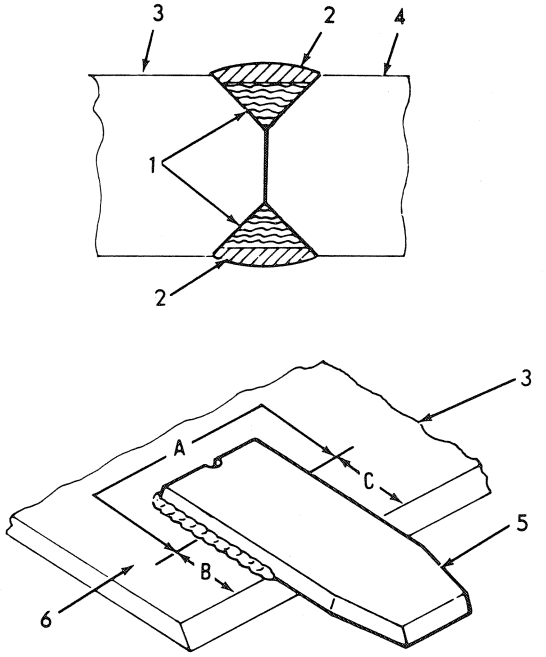


FIG.11 WELDING BUTTING EDGE AND TEETH TO BUCKET T-78636

1.Multi-pass weld
2.Cover pass weld
3.Cutting edge L.H.
4.Cutting edge R.H.
5.Shank
6.Shank weld sequence

2.3.4.1
Preheat shank and cutting edge to 175° - 235°C (350°-450°F) before tacking, allow heat to soak in gradually over a fairly large area of cutting edge. Use E7018(ACS-76) or E70T-1(ACS-77). Inter-pass temperature to be 235°C (450°F) maximum. Start weld at center of shank leg and weld one pass around back of shank to center of opposite side. Then back step with one pass on each side from leading edge to center of shank leg. Repeat sequence until weld is complete (Fig. 5). Finish with weld under shank and blend into the weld on each side of the shank. Blend from 25.4mm (1") fillet weld at front to 12.7mm (1/2") fillet weld at rear of shank. After each weld pass peen weld to remove slag and relieve welding stress.

2.4 INSTALLATION OF BUCKET

2.4.1
To install the bucket, reverse the procedure used for removal.

2.4.2
Torque lock nuts to 81-108 Nm (60-80 lbs. ft.) lubricated.

2.4.3
Grease all connecting pins with proper lubricant. Refer to each respective Operating Instructions and Field Maintenance Manual.

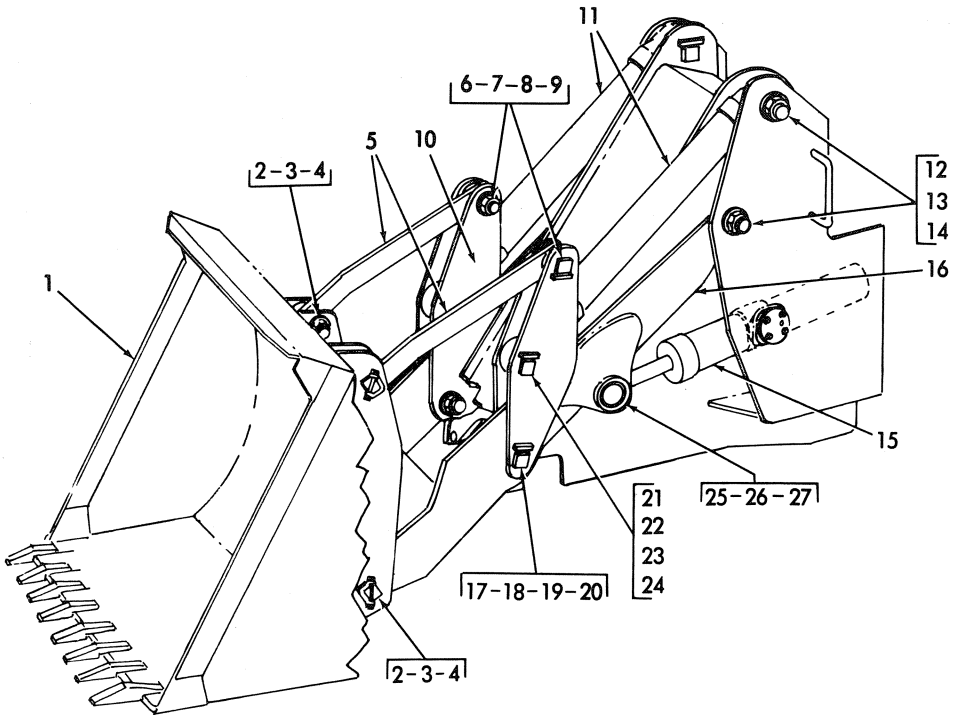


FIG. 12 CROSS AND DUMP LINKS - LOCATION (TYPICAL) T-78637

1.Bucket
2.Capscrew
3.Pivot pin
4.Locknut
5.Dump link
6.Locknut
7.Washer
8.Spacer washer
9.Pivot pin
10.Pivot Pin
11.Dump cylinder
12.Capscrews(not used)
13.Locknut
14.Pivot pin
15.Lift cylinder
16.Boom assembly
17.Locknut
18.Washer
19.Spacer washer
20.Pivot pin
21.Washer
22.Locknut
23.Pivot pin
24.Spacer washer
25.Cotter pin
26.Lock pin
27.Pivot pin

2.5 DUMP LINKS

2.5.1 REMOVAL OF DUMP LINKS

==========

⚠ WARNING -Before moving machine or attachments be sure exposed people in the area are clear of the machine. Walk completely around machine before mounting. Sound horn.

==========

⚠ WARNING -Never attempt to operate machine or attachment except when seated in the operator's seat. Keep head, body, limbs, hands and feet inside the operator's compartment to reduce exposure to hazards outside the operator's compartment.

==========

⚠ WARNING -Warn all people who may be servicing or working around machine before starting engine.

==========

⚠ WARNING -Do not run engine of this machine in closed areas without proper ventilation to remove deadly exhaust gases.

==========

⚠ WARNING -Keep people clear of attachments and tools while in raised position, to prevent possible injury.

==========

⚠ WARNING -Observe all start up and shut down procedures and WARNINGS listed in the Operation and Maintenance Instruction Manual.

==========

⚠ WARNING -When servicing or maintenance requires access to areas that cannot be reached from the ground, use a ladder or step platform that meets local or national requirements to reach the service poinnt. Perform all service or maintenance carefully.

==========

⚠ WARNING -It is unsafe to strike hardened steel parts with anything other than a soft iron or non-ferrous hammer. When installing or removing such parts wear safety glasses with side shields and heavy gloves, etc., to reduce the possibility of injury.

==========

⚠ WARNING -Lift and handle all heavy parts with a lifting device or proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided. Watch out for people in the vicinity.

2.5.1.1
Operate loader and position bucket flat on the ground. Place bucket and boom control levers in the neutral position. Engage control lever lock and stop engine.

2.5.1.2
Attach hoist to dump link, Fig. 12 (5). Remove bucket pivot pin retaining capscrew (2) and locknut (4). Remove pivot pin (3).

2.5.1.3
Remove locknut(6), washer(7), pivot pin (9) and spacer washers(8). Remove dump link and lower to ground.

2.5.2 INSTALLATION OF DUMP LINK

2.5.2.1
Attach hoist to dump link(5) and raise into position. Install bucket pivot pin(3), pivot pin retaining capscrew (2) and locknut(4).

2.5.2.2
Install cross link pivot pin(9). Use spacer washers(8) as required 0.91mm (.0359 in) thick or 1.50mm (.059 in) thick to allow a maximum of 0.79mm(.031 in) end play between dump link(5) and cross links(10). Install washer(7) and locknut(6).

2.5.2.3
Torque locknut(4) to 81-108 Nm (60-80 lbs.ft) and locknut(6) to 508-563 Nm (375-415 lbs.ft.) lubricated.

2.5.2.4
Grease cross and dump link pivot pins, refer to operator's manual for proper lubricant.

2.6 CROSS LINKS

2.6.1 REMOVAL OF CROSS LINKS

==========

⚠ WARNING -Before moving machine or attachments be sure exposed people in the area are clear of the machine. Walk completely around machine before mounting. Sound horn.

==========

⚠ WARNING -Never attempt to operate machine or attachment except when seated in the operator's seat. Keep head, body, limbs, hands and feet inside the operator's compartment to reduce exposure to hazards outside the operator's compartment.

==========

⚠ WARNING -Warn all people who may be servicing or working around machine before starting engine.

==========

⚠ WARNING -Do not run engine of this machine in closed areas without proper ventilation to remove deadly exhaust gases.

==========

⚠ WARNING -Keep people clear of attachments and tools while in raised position, to prevent possible injury.

==========

⚠ WARNING -Observe all start up and shut down procedures and WARNINGS listed in the Operation and Maintenance Instruction Manual.

==========

⚠ WARNING -Do not work under or near an unblocked or unsupported linkage, parts or machine.

==========

⚠ WARNING -When servicing or maintenance requires access to areas that cannot be reached from the ground, use a ladder or step platform that meets local or national requirements to reach the service point. Perform all service or maintenance carefully.

==========

⚠ WARNING -It is unsafe to strike hardened steel parts with anything other than a soft iron or non-ferrous hammer. When installinng or removing such partss wear safety glasses with side shields and heavy gloves, etc., to reduce the possibility of injury.

==========

⚠ WARNING -Lift and handle all heavy parts with a lifting device of proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided. Watch out for people in the vicinity.

2.6.1.1
Operate loader and place bucket on flat surface in full dump position. Be sure cross links,Fig.12(10) are resting forward on boom stops. Place bucket and boom control levers in the neutral position. Enagage control lever lock and stop engine.

2.6.1.2
Refer to paragraphs 2.5.1 and remove dump link.

2.6.1.3
Place wooden support between dump cylinder(11) and boom (16) to prevent cylinder from falling. Remove dump cylinder to cross link pivot pin locknut(22), washer(21), spacer washer(24) and pivot pin(23). Start engine and slowly retract dump cylinder rod end. Place bucket and boom control levers in the neutral position. Engage control lever lock and stop engine.

2.6.1.4
Attach hoist to inner cross link(10). Remove cross link to boom pivot pin locknut(17),washer(18),spacer washer (19). Remove pivot pin(20) partially through boom until inner cross link is free. Remove cross link and lower to the ground. Attach hoist to outer cross link and finish removing the pivot pin and lower cross link to the ground.

2.6.2 INSTALLATION OF CROSS LINKS
NOTE: Use spacer washers as required 0.91mm(.0359 in)thick or 1.50mm (.059 in) thick to allow a maximum of 0.79 mm (.031 in) end play between cross links and boom (FR10, FR12 and FR15), cross links and dump cylinder rod end (FR15), and dump link (FR10,FR12 and FR15). Use spacer washers as required 1.588 mm (.0625 in) thick to allow a maximum of 3.175 mm (.125 in), end play between cross link and dump cylinder rod end (FR10 and FR12).

2.6.2.1
Install cross links and dump link, reverse the procedure used for removal.

2.6.2.2
Torque locknut(4) to (60-80 lbs.ft) and locknuts(6),(22) and (17) to 508-563 Nm (375-415lbs.ft).

2.6.2.3
Grease cross and dump link pivot pins, refer to operator's manual for proper lubricant.

2.7 BOOM

2.7.1 REMOVAL OF BOOM

==========

WARNING -Before moving machine or attachments be sure exposed people in the area are clear of the machine. Walk completely around machine before mounting. Sound horn.

==========

WARNING -Never attempt to operate machine or attachment except when seated in the operator's seat. Keep head, body, limbs, hands and feet inside the operator's compartment to reduce exposure to hazards outside the operator's compartment.

==========

WARNING -Warn all people who may be servicing or working around machine before starting engine.

==========

WARNING -Do not run engine of this machine in closed areas without proper ventilation to remove deadly exhaust gases.

==========

WARNING -Keep people clear of attachments and tools while in raised position, to prevent possible injury.

==========

WARNING -Observe all start up and shut down procedures and WARNINGS listed in the Operation and Maintenance Instruction Manual.

==========

WARNING -Do not work under or near an unblocked or unsupported linkage, parts or machine.

==========

WARNING -When servicing or maintenance requires access to areas that cannot be reached from the ground, use a ladder or step platform that meets local or national requirements to reach the service point. Perform all service or maintenance carefully.

==========

WARNING -It is unsafe to strike hardened steel parts with anything other than a soft iron or non-ferrous hammer. When installinng or removing such partss wear safety glasses with side shields and heavy gloves, etc., to reduce the possibility of injury.

==========

WARNING -Lift and handle all heavy parts with a lifting device of proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided. Watch out for people in the vicinity.

2.7.1.1
Refer to paragraph 2.2 and 2.5 for removal of Bucket, Fig.12 (1) and dump links (5).

2.7.1.2
Position loader in work area for boom removal. Be sure boom(16) is in the lower position and the cross links(10) are resting forward on boom stops. Place bucket and boom control levers in the neutral position. Engage control lever lock and stop engine.

2.7.1.3
Place wooden support between dump cylinders (11) and boom (16) to prevent cylinders from falling. Remove the dump cylinders to cross links, pivot pin mounting hardware (22),(24),(21) and pivot pin(23). Start engine and retract dump cylinder rods to witin 12.7 mm (.50 in)of fully retracted. Stop engine and relieve pressure in hydraulic system.

Place bucket and boom control levers in neutral position and engage control lever lock.

2.7.1.4
Refer to paragraph 2.6.1.4 for removal of cross links.

NOTE: Remove bucket leveler and boom kickout assemblies to protect them from damage during removal and installation of dump cylinder and boom.

2.7.1.5
Disconnect dump cylinder hose assemblies at cross over supply tubes located in the front frame. Cap the hoses and tubes to prevent dirt from entering the hydraulic system. Attach hoist to dump cylinder, then remove pivot pin retaining locknut(13),and pivot pin(14),lower cylinder to ground.Repeat operation for other dump cylinder.

2.7.1.6
Attach hoist to cross tube member of boom. The hoist must travel upward with the boom. Leave hoist attached until boom stand is in place. START ENGINE, put boom control lever in raise position and raise boom until lift cylinder to boom pivot pin clears the tires to provide clearance for pin removal. Support boom with stand at cross tube member. Refer to paragraph 2.11. Shut off the engine and relieve pressure in hydraulic system.

2.7.1.7
Remove hoist from boom and attach to lift cylinder(15). Remove lift cylinder to boom, pivot pin, cotter pin(25),lock pin (26) and pivot pin (27). Lower lift cylinder to rest on wooden support.

Care is to be taken not to damage exposed cylinder rod.Repeat operation for other lift cylinder.

2.7.1.8
Attach hoist to boom in a manner that will balance the boom for removal. Remove boom to front frame pivot pin retaining locknut(13), and boom pivot pin(14).Remove boom(16)from front frame and lower to ground.

2.8 CLEANING AND INSPECTION OF BUSHINGS AND PIVOT PINS

==========

⚠ WARNING -Never use gasoline,solvent or other flammable fluids to clean elements or parts.

2.8.1
Using an authorized commercial non-flammable, non-toxic solvent, clean the grease from inside the cross links, dump link, boom bores and pivot pins.

2.8.2
Inspect the cross links dump links and boom pins and bushings. Should the pins or bushings show signs of extreme wear or exceed a maximum wear of 1.27mm (.05 in), the pins and bushings should be replaced. To determine this wear check O.D. dimension of pivot pins and the I.D. dimension of bushings. Refer to Topic 8 Linkage Wear Limits.

2.9 BUSHING REPLACEMENT

==========

⚠ WARNING -Wear proper protective equipment such as safety goggles or safety glasses with side shields, hard hat, safety shoes, heavy gloves, when metal or other particles are apt to fly or fall.

==========

⚠ WARNING -Wear welders protective equipment such as dark safety glasses, helmets, protective clothing, gloves and safety shoes when welding or burning. Wear dark safety glasses near welding."Do not look at the arc without proper eye protection".

==========

⚠ WARNING -Dry ice(solid carbon dioxide) is extremely cold and will freeze flesh on contact. Use care to prevent contact with skin, eyes, or other parts of the body to avoid personal injury.

2.9.1
To remove or install bushings it is recommended to use the following tool:
A. Hand pump
B. Hydraulic ram 45,35 M ton (50 ton)
C. Threaded screw adapter
D. Threaded screw with speed handle
E. Sleeve,63mm (2.50 in) I.D. X 127mm (5 in) long.
F. Puller plate (same O.D. as the bushing)

2.9.2
Run a weld bead around the I.D. of the bushing. As the weld cools it will contract the bushing. While the bushing is cooling set up the recommended pulling tools, then pull the bushing.

2.9.3
Freeze the replacement bushings prior to installation.Special care and proper alignment must be taken when installing a new bushing to prevent damage to the bushing or bushing bore. Use the recommended tools and press the bushing into the bore.

2.10 INSTALLATION OF BOOM

2.10.1
To install the boom, reverse the procedure used for removal.

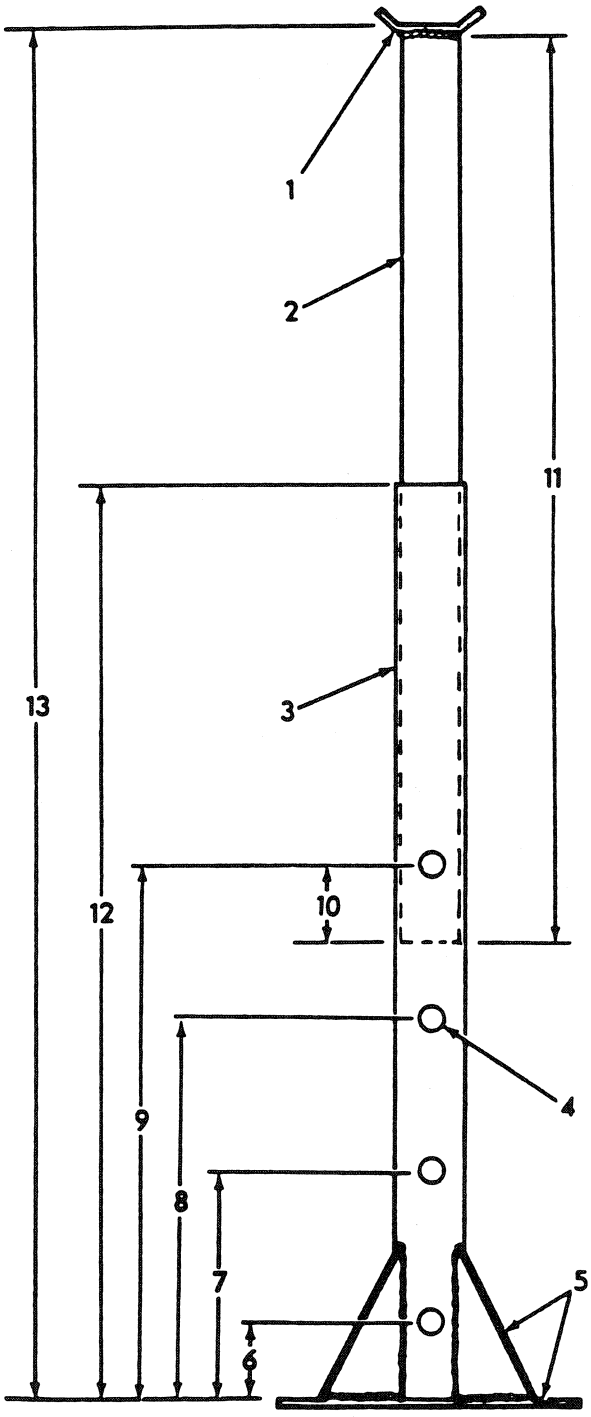
2.10.2
Torque the upper boom pivot pin retaining locknut to 983-1085 Nm (725-800 lbs. ft).

2.10.3
Connect the dump cylinder oil supply lines and torque the dump cylinder pin retaining locknut to 644 - 712 Nm (475 - 525 lbs.ft).

2.10.4
Refer to paragraphs 2.4, 2.5.2, 2.6.2 for installation of cross links, dump links and bucket.

2.11 BOOM SUPPORT STAND

If necessary to hold the boom in the raised position, use a boom stand (Part No. 75300989) as shown below -- or fabricate a stand from the given dimensions.



1. Support, 8" x 8" (1/4" weld)
2. Steel pipe (O.D. 4.5")
   (Wall 0.337" min)
3. Steel pipe (O.D. 5.5")
   (Wall 0.375" min)
4. Holes, 1.56" dia.(use 1.5"x6"pin)
   (4 places in 5" pipe)
   (1 place in 4" pipe)
5. Bottom plate, 24" x 24"
   (thickness 0.375")
   Vertical plates (4) 9" x 12"
   (thickness 0.375")
   Weld (3/16") both sides of all four plates.
6. 6.0"
7. 18.0"
8. 30.0"
9. 42.0"
10. 6.0"
11. 72.0"
12. 72.0"
13. 108.0"

FIG.13 BOOM STAND T-84262

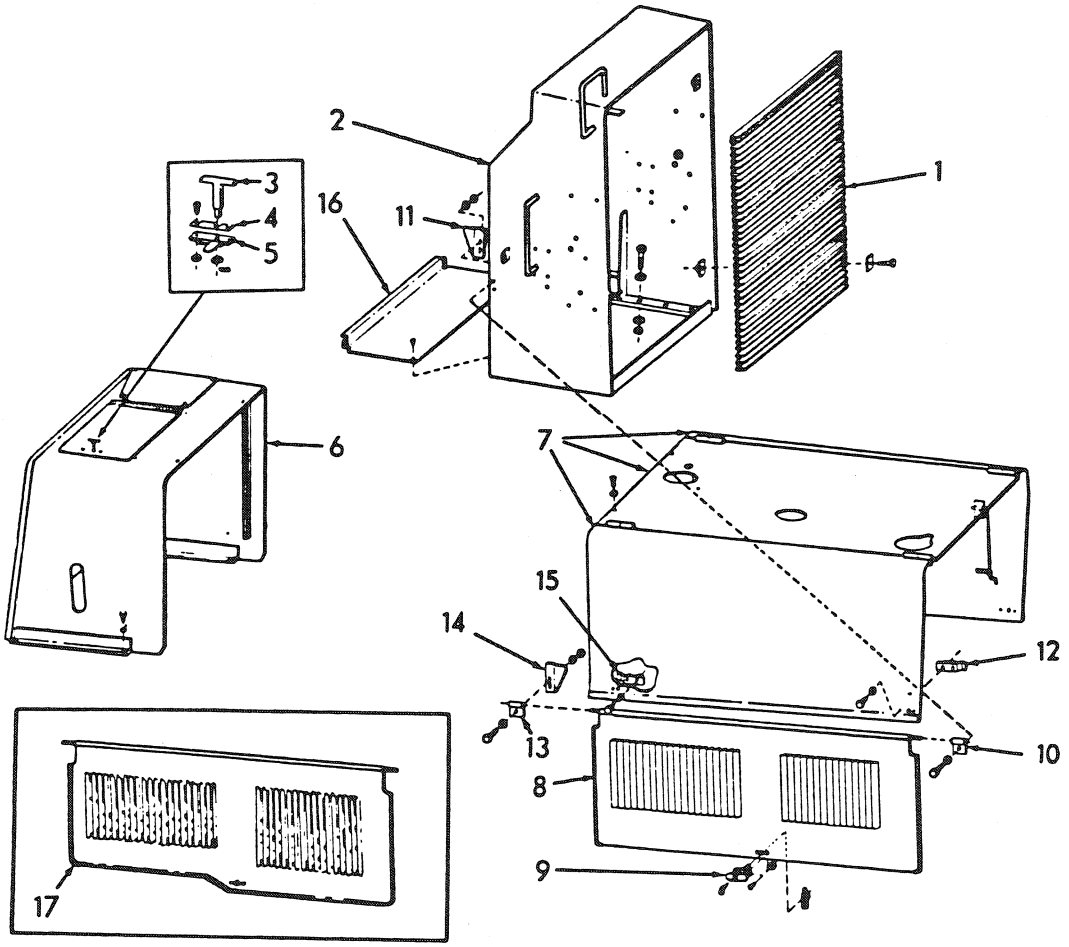


FIG. 14 GRILL, HOOD & SIDE PANELS (FR10 & FR12) T-81401

1.Grill
2.Radiator support
3."T" handle
4.Shim(as required)
5.Latch
6.Bonnet cover
7.Hood
8.Side panel(std)
9.Lock handle
10.Hinge
11.Mounting plate
12.Latch
13.Hinge
14.Mounting plate
15.Latch
16.Cover plate
17.Side panel(special equipment)

3.1 GRILL, HOOD & SIDE PANELS

3.1.1 REMOVAL

==========

⚠ WARNING -Lift and handle all heavy parts with a lifting device of proper capacity. Be sure parts are supported by proper slings and hooks. Use lifting eyes if provided. Watch out for people in the vicinity.

==========

⚠ WARNING -When servicing or maintenance requires access to areas that cannot be reached from the ground, use a ladder or step platform that meets local or national requirements to reach the service point. Perform all service or maintenance carefully.

NOTE: Loosen clamp and remove air cleaner cap and filter indicator from extension tube before removal of hood. Place a protective cover over the extension tube to prevent any foreign matter from entering the system.

3.1.2
Remove the attaching hardware from the item to be removed. Then remove the item. Refer to Fig.14.

3.2 INSTALLATION

3.2.1
Reverse the procedure for removal. Refer to Fig.14.

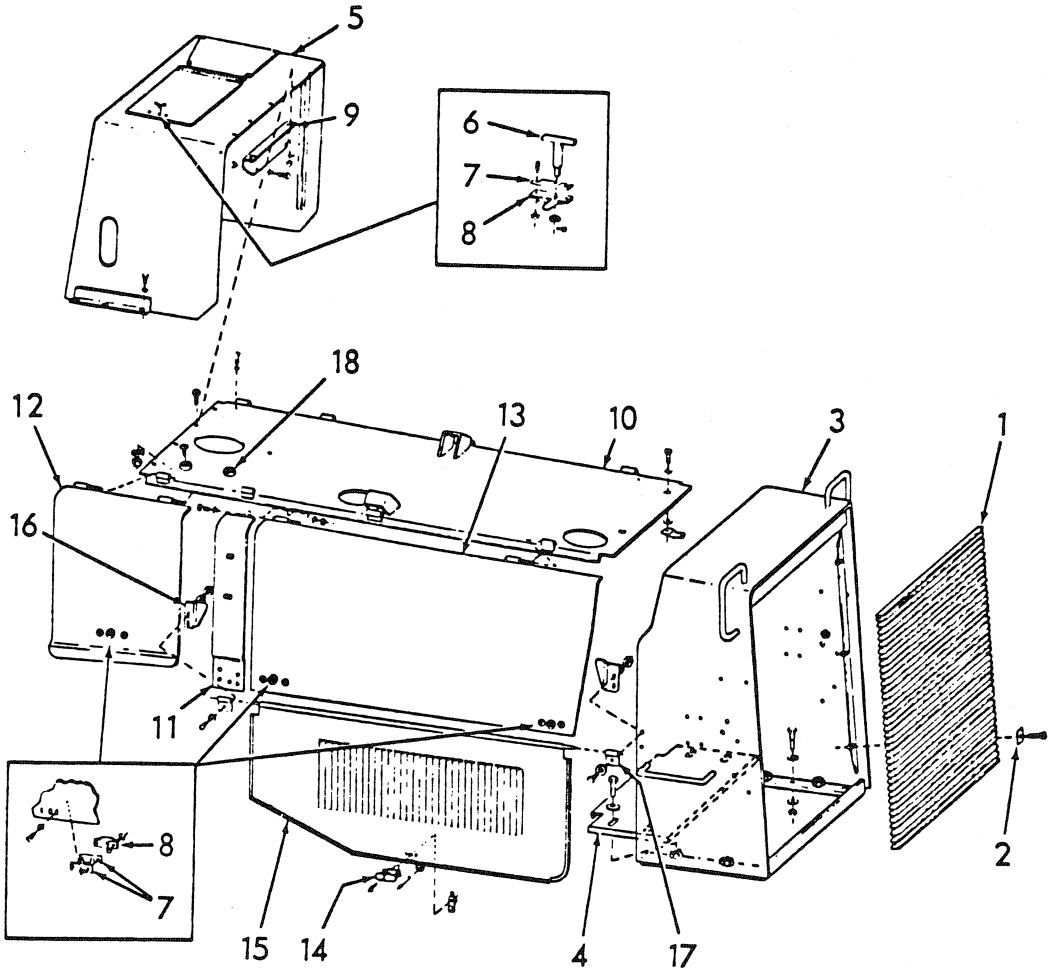


FIG. 15 GRILL, HOOD & SIDE PANELS (FR15) T-83243

1.Grill
2.Block
3.Radiator support
4.Cover plate
5.Bonnet cover
6."T" handle
7.Shim(as required)
8.Latch
9.Support bracket
10.Hood
11.Panel support
12.Service panel
13.Side panel(upper
14.Lock handle
15.Side panel(lower)
16.Mounting plate
17.Hinge
18.Bumper