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PURCHASER MAY NOT ATTEMPT TO ENLARGE ITS RIGHTS UNDER THE WARRANTY BY MAKING A CLAIM FOR INDEMNITY, FOR BREACH OF CONTRACT, FOR BREACH OF COLLATERAL WARRANTY, FOR A TORT (INCLUDING NEGLIGENCE, MISREPRESENTATION OR STRICT LIABILITY) OR BY CLAIMING ANY OTHER CAUSE OF ACTION.

THE WARRANTY IS A CONDITION OF SALE OF THE PRODUCT TO PURCHASER AND WILL THEREFORE APPLY EVEN IF PURCHASER ALLEGES THAT THERE IS A TOTAL FAILURE OF THE PRODUCT.

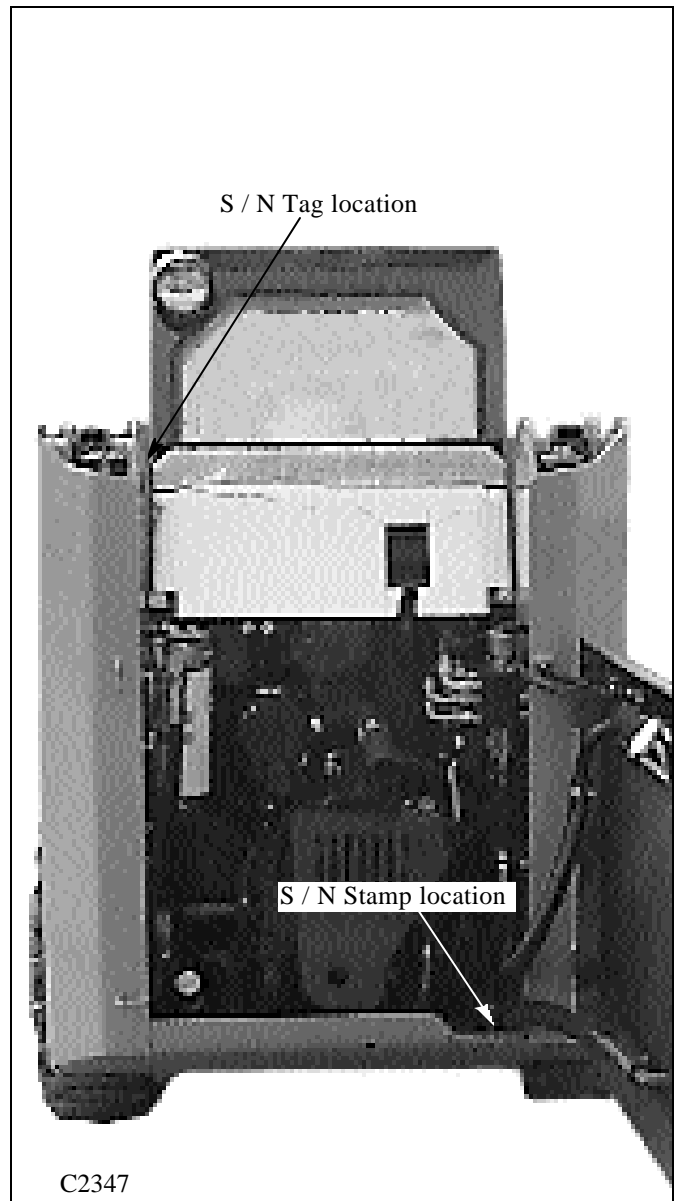
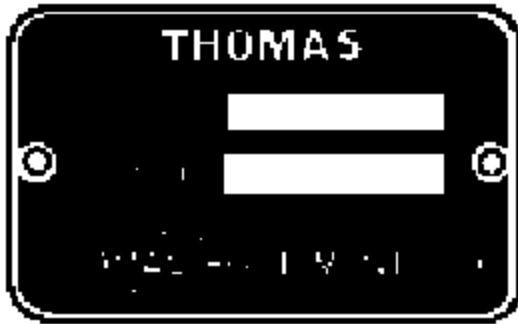
*N.B. Read and practice your **Thomas** operating and servicing instructions. Failure to do this may void your warranty.*

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# FOREWORD

It is important when ordering replacement parts or making a service inquiry to provide both the model number and serial number of your Thomas loader. The serial number plate is located at the rear of the machine on the right hand side fuel tank. In the event that the serial number plate is missing, the model number and serial number are both stamped into the main frame inside the rear door, next to the hydraulic control valve.



# SAFETY PRECAUTIONS

Practically all Service work involves the need to drive the loader. The Owner's / Operator's Manual, supplied with each loader, contains safety precautions relating to driving, operating and servicing that loader. These precautions are as applicable to the service technicians as they are to the operator and should be read, understood and practiced by all personnel.

Prior to undertaking any maintenance, repair, overhaul, dismantling or re-assembly operations, whether within the shop facility or "out in the field", may have an effect upon safety, not only upon the mechanic carrying out the work but also upon bystanders.

## PERSONAL CONSIDERATIONS

### \* CLOTHING

The wrong clothing or carelessness in dress can cause accidents. Check to see that you are suitably clothed. Some jobs require special protective equipment.

### \* SKIN PROTECTION

Used motor oil may cause skin cancer. Follow work practices that minimize the amount of skin exposed and length of time used oil stays on your skin.

### \* EYE PROTECTION

The smallest eye injury may cause loss of vision. Injury can be avoided by wearing eye protection when engaged in chiseling, grinding, welding, painting and any other task that involves foreign matter.

### \* BREATHING PROTECTION

Fumes, dust and paint spray are unpleasant and harmful. These can be avoided by wearing respiratory protection.

### \* HEARING PROTECTION

Loud noise may damage your hearing and the longer the exposure the greater the risks of hearing damage. Always wear hearing protection when working around loud machinery.

### \* HAND PROTECTION

It is advisable to use a protective cream before work to prevent irritation and skin contamination. After work, clean your hands with soap and water. Solvents such as white spirits, paraffin, etc. may harm the skin.

### \* FOOT PROTECTION

Substantial or protective footwear with reinforced toecaps will protect the feet from falling objects. Additional oil-resistant soles will help to avoid spilling.

### \* SPECIAL CLOTHING

For certain work it may be necessary to wear flame or acid resistant clothing.

## CAUTION

**Avoid injury through incorrect handling of components. Make sure you are capable of lifting the object. If in doubt, get help.**

## EQUIPMENT CONSIDERATIONS

### \* MACHINE GUARDS

Before using any machine, check to ensure that the machine guards are in position and serviceable. These guards not only prevent parts of the body or clothing coming in contact with the moving parts of the machine but also ward off objects that might fly off the machine and cause injury.

### \* LIFTING APPLIANCES

Always ensure that lifting equipment, such as chains, slings, lifting brackets, hooks and eyes are thoroughly checked before use. If in doubt, select stronger equipment. Never stand under a suspended load or raised implement.

### \* COMPRESSED AIR

The pressure from a compressed air line is often as high as 100 PSI (6.9 Bar). Any misuse may cause injury.

Never use compressed air to blow dust, filing dirt, etc. away from your work area unless the correct type of nozzle is fitted.

Compressed air is not a cleaning agent. It will only move dust etc. from one place to another. Look around before using an air hose as bystanders may get grit into their eyes, ears and skin.

# SAFETY PRECAUTIONS

## \* HAND TOOLS

Many cuts, abrasions and injuries are caused by defective tools. Never use the wrong tool for the job as this leads either to some injury or to a poor job done.

Never Use:

A hammer with a loose or split handle.

Spanners or wrenches with splayed or worn jaws.

Wrenches or files as hammers; drills or clevis pins or bolts as punches.

For removing or replacing hardened pins use a copper or brass drift rather than a hammer.

For dismantling, overhaul and assembly of major and sub-components always use the Special Service Tools recommended. These will reduce the work effort, labor time and the repair cost.

Always keep tools clean and in good working order.

## \* ELECTRICITY

Electricity has become so familiar in day to day usage that it's potentially dangerous properties are often overlooked. Misuse of electrical equipment can endanger life.

Before using any electrical equipment, particularly portable appliances, make a visual check to ensure that the cable is not worn or frayed and that the plugs, sockets etc. are intact. Make sure you know where the nearest isolating switch for your equipment is located.

## GENERAL CONSIDERATIONS

### \* SOLVENTS

Use only cleaning fluids and solvents that are known to be safe. Certain types of fluids can cause damage to components such as seals, etc. and can cause skin irritation. Solvents should be checked that they are suitable not only for the cleaning of components and individual parts but also that they do not affect the personal safety of the user.

## \* HOUSEKEEPING

Many injuries result from tripping or slipping over, or on, objects or materials left lying around by a careless worker.

Prevent these accidents from occurring. If you notice a hazard, don't ignore it, remove it.

A clean, hazard free place of work improves the surroundings and daily environment for everybody.

## \* FIRE

Fire has no respect for persons or property. The destruction that a fire can cause is not always fully realized. Everyone must be constantly on guard.

- Extinguish matches, cigars, cigarettes etc. before throwing them away.

- Work cleanly, disposing of waste material into proper containers.

- Locate all the fire extinguishers and ensure all personnel know how to operate them.

- Do not panic, warn those near and sound the alarm.

- Do not allow or use an open flame near the loader fuel tank, battery or component parts.

## \* FIRST AID

In the type of work that mechanics are engaged in, things such as dirt, grease, fine dust etc. all settle upon the skin and clothing. If a cut, abrasion or burn is disregarded it may be found that a septic condition has formed in a short time. What appears at first to be trivial could become painful and injurious. It only takes a few minutes to have a fresh cut dressed but it will take longer if you neglect it.

## \* CLEANLINESS

Cleanliness of the loader hydraulic system is essential for optimum performance. When carrying out service and repairs, plug all hose ends and components connections to prevent dirt entry.

Clean the exterior of all components before carrying out any form of repair. Dirt and abrasive dust can reduce the efficiency and working life of a component and lead to costly replacement. Use of a high pressure washer or steam cleaner is recommended.

# SAFETY PRECAUTIONS

## OPERATIONAL CONSIDERATIONS

- \* Stop the engine, if at all possible, before performing any service.
- \* Place a warning sign on loaders which, due to service or overhaul, would be dangerous to start. Disconnect the battery leads if leaving such a unit unattended.
- \* Do not attempt to start the engine while standing beside the loader or attempt to bypass the safety starting system.
- \* Avoid prolonged running of the engine in a closed building or in an area with inadequate ventilation as exhaust fumes are highly toxic.
- \* Always turn the radiator cap to the first stop to allow pressure in the system to dissipate when the coolant is hot.
- \* Never work beneath a loader which is on soft ground. Always take the unit to an area which has a hard working surface, preferably concrete.
- \* If it is found necessary to raise the loader for ease of maintenance, make sure that safe and stable supports are installed beneath the main frame before commencing work.
- \* Use footsteps or working platforms when servicing those areas of the loader that are not within easy reach.
- \* Before loosening any hoses or tubes, switch off the engine, remove all pressure in the lines by operating the foot pedals several times. This will remove the danger of personal injury by oil pressure.
- \* Prior to pressure testing, make sure all the hoses and connectors on both the loader and on the test machine are in good condition and tightly sealed. Pressure readings must be taken with the gauges specified. The correct procedure should be rigidly observed to prevent damage to the system or the equipment and to eliminate the possibility of personal injury.
- \* Always lower equipment to the ground when leaving the loader.
- \* If high lift attachments are installed on a loader, beware of overhead power and telephone lines when travelling. Drop attachment near to ground level to increase stability and minimize risks.
- \* Do not park or attempt to service a loader on an incline. If unavoidable, take extra care and block the wheels.
- \* 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 search for leaks. Stop the engine and relieve pressure before connecting or disconnecting lines. Tighten all connections before starting the engine or pressurizing the lines. If any fluid is injected into the skin, obtain medical attention immediately.
- \* Prior to removing wheels and tires from a loader, check to determine whether additional ballast (liquid or weight) has been added. Seek assistance and use suitable equipment to support the weight of the wheel assembly.
- \* When inflating tires beware of over inflation.; constantly check the pressure. Over inflation can cause tires to burst and result in personal injury.
- \* Safety precautions are very seldom the figment of someone's imagination. They are the result of sad experience where most likely someone has paid dearly through personal injury.
- \* Heed these precautions and you will protect yourself accordingly. Disregard them and you will duplicate the sad experiences of others.

# SAFETY PRECAUTIONS

## SERVICE TECHNIQUES

### A. SERVICE SAFETY

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all motor vehicles as well as the personal safety of the individual doing the work. This shop manual provides general directions for accomplishing service and repair work with tested effective techniques. Following them will help assure reliability. There are numerous variations in procedures, techniques, tools and parts for servicing vehicles as well as in the skill of the individual doing the work. This manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this manual must first establish that he or she compromises neither his personal safety nor the vehicle integrity by his choice of methods, tools or parts.

### B. SERVICE TECHNIQUES

Clean the exterior of all components before carrying out any form of repair. Dirt and abrasive dust can reduce the efficient working life of a component and lead to costly replacement.

Use cleaning fluids which are known to be safe. Certain types of fluid can cause damage to O rings and cause skin irritation. Solvents should be checked that they are suitable for the cleaning of components and also that they do not risk the personal safety of the user.

Time spent on the preparation and cleanliness of working surfaces will pay dividends in making the job easier and safer and will result in overhaul components being more reliable and efficient in operation.

Replace O rings, seals or gaskets whenever they are disturbed. Never mix new and old seals and O rings, regardless of condition. Always lubricate new seals and O rings with hydraulic oil before installation.

When replacing component parts use the correct tool for the job.

### C. HOSES AND TUBES

Always replace hoses and tubes if the end connections are damaged. Be sure any hose installed is not kinked or twisted.

When installing a new hose, loosely connect each end and make sure the hose takes up the designed position before tightening the connection. Clamps should be tightened sufficiently to hold the hose without crushing and to prevent chafing.

The hoses are the arteries of the unit; be sure they are in good condition when carrying out repairs or maintenance otherwise the machines output and productivity will be affected.

After hose replacement to a moving component, check that the hose does not foul by moving the component through the complete range of travel.

Hose connections which are damaged, dented, crushed or leaking, restrict oil flow and the productivity of the components being served. Connectors which show signs of movement from the original swaged position have failed and will ultimately separate completely.

A hose with a chafed outer cover will allow water entry. Concealed corrosion of the wire reinforcement will subsequently occur along the hose length with resultant hose failure.

Ballooning of the hose indicates an internal leakage due to structural failure. This condition rapidly deteriorates and total hose failure soon occurs.

Kinked, crushed, stretched or deformed hoses generally suffer internal structural damage which results in oil restriction, a reduction in the speed of operation and ultimate hose failure.

Free moving, unsupported hoses must never be allowed to touch each other or related working surfaces. This causes chafing which reduces hose life.

### D. PRESSURE TESTING

Prior to pressure testing, be sure all hoses are in good condition and all connections tight. Pressure readings must be taken with gauges of specified pressure readings.

The correct procedure should be rigidly observed to prevent damage to the system or the equipment and to eliminate the possibility of personal injury.

# SAFETY PRECAUTIONS

## E. BEARINGS

Bearings which are considered suitable for further service should be cleaned in a suitable solvent and immersed in clean lubricating oil until required.

Installation of a bearing can be classified into two (2) ways:

- press fit on rotating parts such as shafts and gears,
- push fit into static locations such as reduction gear houses.

Where possible, always install the bearing onto the rotating components first. Use the correct tools or a press to install a bearing or bushing. In the absence of the correct tools or press, heat the bearing and / or casing in hot oil to assist the installation of the bearing.

When bearings or bushings are removed, always carefully check that the bearing is free from discoloration and signs of overheating. Also check for mechanical damage such as excessive clearance, nicks and scuffing. If in doubt, replace the bearings or bushings.

Bearings should never be removed unless absolutely necessary. Always use the recommended puller to reduce the risk of bearing or related component failure.

These bearings and bushings are subjected, in normal operation, to high working loads and adverse conditions.

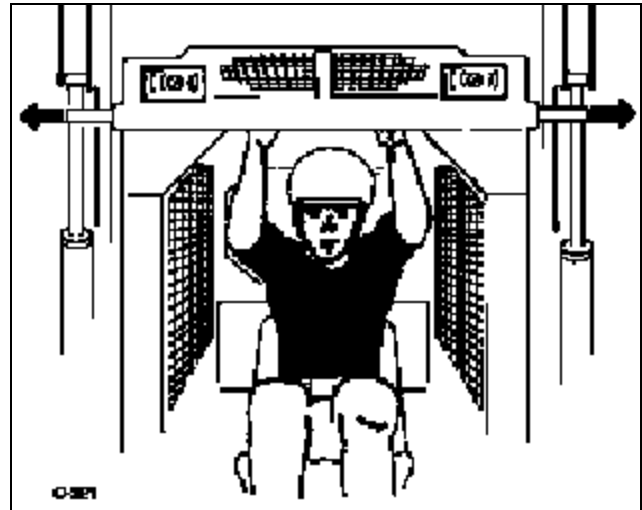
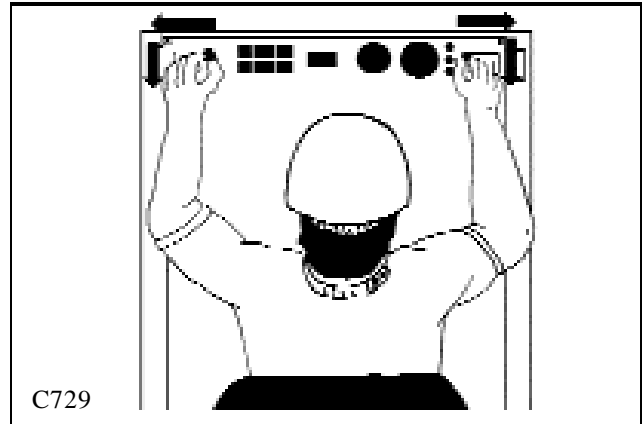
Be sure during normal routine servicing, maintenance or repair that bearings are given the right attention and are installed with care.

## F. BOOM SUPPORTS

For safety while performing regular service or maintenance work, the loader is equipped with boom supports.

The boom supports, when extended, prevent the boom arms from dropping if hydraulic pressure is relieved or the foot control pedals are accidentally cycled.

To operate the boom supports, first remove any bucket or attachment from the quick - tach; raise the boom arms to full height and shut off the engine. Raise the boom handles up and push out toward the boom arms to extend the boom supports. (fig. C729, C321)



**WARNING**

**To avoid personal injury, service the loader with the boom arms down and the bucket or attachment lowered to the ground. If it is necessary to service the loader with the boom arms raised, be sure to engage the boom supports. Never work under or around a loader with raised boom arms without the boom supports engaged.**



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