Operation, Installation, Service, and Parts Manual for

TANDEM CABLE ROLL-OFF HOIST

MODEL: __________________________________

DATE: __________________________________

SERIAL NO: __________________________________

! WARNING!

If incorrectly used, this equipment can cause severe injury. Those who use and maintain the equipment should be trained in its proper use, warned of its dangers, and should read the entire manual before attempting to set up, operate, adjust, or service the equipment. Keep this manual for future reference.
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HOIST MODEL INSERT:
Main Frame Parts List
Sub Frame Parts List Tail Assembly Parts List
Tail Assembly Parts List

OPTIONAL EQUIPMENT INSERTS
Enclosed in the packet with this manual are the inserts for optional equipment purchased with this hoist such as lift axle, tarpers and PTO information.
INTRODUCTION

This manual contains composite drawings, necessary instructions, charts, and parts lists for the Tandem Truck Roll-Off Hoist and its options.

It is required that the operators and all involved personnel read this manual and become thoroughly familiar with its contents, especially its sections regarding the operating procedures for this machine.

OPERATOR INSTRUCTION CERTIFICATION & RECEIPT
(Form No. 92025)

Enclosed with this manual is the above mentioned certificate and receipt. The purpose of this certificate is to ensure that the owner and/or operator of Galbreath equipment receives the manual and is instructed in the proper usage of the equipment.

Note:
This form, 92025, must be completed, signed, and returned to Galbreath Incorporated to be placed in our files otherwise NO claim for warranty will be considered for this equipment.

Galbreath, Inc.
P.O. Box 220
461 E. Rosser Drive
Winamac, IN 46996
800-285-0666
574-946-6631

© COPYRIGHT
We believe the Galbreath support staff to be the most efficient in the industry. We will provide prompt processing of service, repair and warranty assistance.

Should you have any questions or problems with your Galbreath hoist you can contact your local dealer, or your Galbreath Customer Service Representative. Phone numbers are on the front cover of this manual.

If you have a problem with your Galbreath hoist the following information will be required and requested by the Galbreath Customer Service Department at Winamac Indiana

- Your Company Name
- Address
- City, State, Zip
- Phone Number and Fax Number (Include Area Code)
- Contact Name for Service Representative To Call
- Equipment Model
- Equipment Serial Number
- Brief description of the problem

The hoist serial number may be found on the Galbreath nameplate next to the main control valve or on the driver’s side front of the tipping frame. The serial number is also welded on the inside driver’s side front of the tipping frame.

If service is required within the warranty period, authorization from the Galbreath Customer Service Department must be obtained before ANY warranty repairs may be performed.

After gathering the above required information, call 1-800-285-0666 and follow the phone directions to access the customer service/warranty department. The customer service representative will handle your call and advise you as to how your situation will be handled.

Sales and application issues please call your local dealer and or your closest Galbreath facility.

**Galbreath Customer Service**  **Galbreath ALL STAR Parts**
Phone 1-800-285-0666  Phone 1-800-946-9476
Fax 1-574-946-4269  Fax 1-574-946-4257
E-Mail rfox@galbreath-inc.com  E-Mail jroth@galbreath-inc.com
GALBREATH INCORPORATED
TANDEM TRUCK ROLL-OFF HOIST
LIMITED WARRANTY & LIMITED LIFETIME FRAME WARRANTY

GALBREATH INCORPORATED ("GALBREATH") warrants its roll-off hoist main frame weldment against failure, as the result of corrosion, for the life of the hoist frame while it's mounted to the original chassis. (IS4063)

GALBREATH warrants the reservoir, pump, hydraulic control valve, and hydraulic cylinders against operational failure caused by defective material or workmanship, which occurs during normal use within two (2) years from date of shipment from our factory.

GALBREATH warrants all other products of its manufacture against operational failure caused by defective material or workmanship, which occurs during normal use within one year from date of shipment from our factory.

GALBREATH will replace all parts of its manufacture free of charge that our inspection at our factory shows to us to be defective in accordance with the above paragraph. Written permission must be obtained from authorized Galbreath personnel for any repairs performed other than in our factory. All claims for reimbursement must be filed with proper documentation no later than forty-five (45) days after occurrence to be allowed.

All products purchased by GALBREATH from an outside vendor shall be covered by the warranty of that respective vendor only, and GALBREATH does not participate in or obligate itself to any such warranty.

No freight, travel cost, meals, lodging, or loss of hydraulic oil shall be covered by this warranty, all labor costs allowed shall be in accordance with GALBREATH'S established rate; in case of alleged defect, product shall be returned to GALBREATH with transportation charges prepaid. No freight collect shipment will be accepted.

GALBREATH makes no warranty on any of its equipment used in any way except as it was designed, intended, and sold to perform.

DISCLAIMER OF WARRANTIES. THE LIMITED AND CONDITIONAL WARRANTY AND REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ANY AND ALL REPRESENTATIONS, SPECIFICATIONS, WARRANTIES AND REMEDIES, EITHER EXPRESS OR IMPLIED, HEREIN OR ELSEWHERE, OR WHICH MIGHT ARISE UNDER LAW OR EQUITY, OR PURSUANT TO ANY COURSE OF DEALING OR CUSTOM OR USAGE OF TRADE, INCLUDING WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR ANY SPECIFIED OR INTENDED PURPOSE.

LIMITATION OF REMEDIES AND LIABILITY. PURCHASER'S SOLE AND EXCLUSIVE REMEDY AGAINST GALBREATH SHALL BE THE REMEDY OF DEFECTS IN PRODUCTS DELIVERED HEREUNDER AS PROVIDED BY, AND WITHIN THE TIME PERIOD SPECIFIED IN, GALBREATH'S LIMITED WARRANTY SET FORTH ABOVE. GALBREATH'S LIMITED WARRANTY CONSTITUTES THE SOLE REMEDY WITH RESPECT TO OR ARISING OUT OF THE EQUIPMENT, PRODUCTS OR SERVICES OF GALBREATH. NOTWITHSTANDING ANY OTHER PROVISIONS HEREOF, IN NO EVENT SHALL GALBREATH BE LIABLE IN CONTRACT, TORT OR EQUITY FOR ANY LOSS OF ANTICIPATED PROFITS, LOST SALES, INJURY TO PERSONS OR PROPERTY, LOSS BY REASON OF PLANT SHUTDOWN, NON-OPERATION OR INCREASED EXPENSE OF OPERATION, SERVICE INTERRUPTIONS, CLAIMS OF CUSTOMERS, COST OF MONEY, LOSS OF USE OF CAPITAL OR REVENUE, OR FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL LOSSES OR DAMAGES OF ANY KIND WHATSOEVER.

All claims shall be processed through the GALBREATH Customer Service Department or your authorized GALBREATH dealer.

GALBREATH INCORPORATED
Revised 2/24/00
OWNER/EMPLOYER RESPONSIBILITY

The employer shall properly maintain mobile equipment to meet all applicable regulatory safety standards and shall be responsible for the following operational requirements:

1. Providing for instruction and training in safe methods of work to employees before assigning them to operate, clean, service, maintain or repair the equipment. This instruction shall include all procedures contained in these instructions. The employer shall maintain records of the names of employees trained and the date of training.

2. Monitoring the employee’s operation of equipment and taking appropriate action to ensure proper use of this equipment, including adherence to safe practices.

3. Establishing and following a program of periodic and regular inspections of all equipment to ensure that all parts, component equipment, and safeguards are in safe operating condition and adjusted in accordance with the manufacturer’s recommendations. This shall include keeping all malfunction reports, records of inspections, and maintenance work performed.

4. Repairing, prior to allowing the equipment to be placed into service, any mechanical malfunction or breakdown that affects the safe operation of the equipment. (Example: cracks, lights, hoses, latches, hitches, holddowns, etc.)

5. Meeting the appropriate lighting requirements before attempting to operate the equipment during hours of darkness. NOTE: The manufacturer is not required to install extra lighting on the equipment.

6. Ensuring this equipment will not be used to lift, haul or move weight that is believed to exceed the load rating capacity in any way of the individual components or the entire piece of equipment. (Example: hoist, tires, truck chassis, suspension, etc.)

7. Ensuring the hoist is adequately supported when the hoist is raised for service or maintenance.

8. Utilizing a lockout procedure when cleaning, servicing, maintaining, or repairing this equipment (See Lockout Procedure).
9. On equipment that carries detachable containers, the employer shall affix a sign or mark on the container near the cab on the driver’s side stating the minimum overhead clearance required for the vehicle and container to pass under when positioned for normal over-the-road travel.

10. Specifically inspecting safety equipment and protective devices to ensure they are not disabled or bypassed. **NOTE:** Do not permit operation of equipment with devices that are not fully functional.
OPERATOR/EMPLOYEE RESPONSIBILITY

Operators/employees who work on or operate mobile equipment shall be responsible for:

1. Using all applicable safety features provided on the equipment.

2. Using equipment only after being properly instructed and trained in accordance with Owner/Employer Responsibility items (1) and (2).

3. Reporting any damage to, or malfunction of, the equipment by submitting a report to the employer or responsible authority either when the damage occurs or as soon thereafter as is practical. (The employer should also document such reports.)

4. Ensuring the work area is clear of all persons during all phases of the operation prior to operating the equipment.

5. Ensuring the work area has sufficient clearance on sides and overhead (Ex: roof or ceiling, side walls, power lines, etc.) for the hoist, truck, and container throughout all phases of operation.

6. Ensuring that all persons are clear of tailgate and container contents that may fall out before the tailgate is opened. The operator shall warn all persons not to cross under a raised container or an open tailgate.

7. Operating all equipment in accordance with the manufacturer’s instructions.

8. Riding only in the cab and not on any other part of the mobile equipment.

9. Never bypass or remove safety devices which have been installed on the equipment. Never operate the equipment unless these devices are fully functional.

10. Container hold downs must be used.

11. Do not operate the equipment if your work ability is impaired by fatigue, illness, or other causes.

12. Never operate equipment that is in need of repair regardless of how slight the repair appears to be.

13. The only allowable place to ride on the equipment when the trailer unit is in motion is in the cab of the tractor.
14. When coupling a container back to a compactor, follow the specifications of the compactor manufacturer.

15. BE ALERT TO ALL POSSIBLE HAZARDOUS SITUATIONS AND CONDITIONS.

Please note that the Owner/Employer and Operator/Employee responsibilities listed are only a guideline, they are not exhaustive. There are other responsibilities, as dictated by the uniqueness of each installation, for which the Owner/Employer and Operator/Employee is responsible.

DANGER

THIS HOIST MUST ONLY BE USED WITH A CONTAINER THAT HAS SPECIFICATIONS THAT MATCH THE HOIST SPECIFICATIONS. (i.e. PROPER STYLE HOOKUP, SPACING BETWEEN LONG SILLS, ETC...) NON-COMPLIANCE COULD RESULT IN DAMAGE TO THE EQUIPMENT AND/OR INJURY TO PERSONS.
LOCKOUT PROCEDURE GUIDELINE

(Required By Safety Standards)

The purpose of a Lockout Procedure is to recognize, isolate, and render safe all types of energy sources. The Lockout Procedure should establish performance habits which provide for the protection from injury for any personnel in, on, or around the equipment during repair, maintenance, and other associated activities.

Compliance and enforcement of a Lockout Procedure is the responsibility of the Owner/Employer and Operator/Employee. The following information is a guide line to achieve a Lockout Procedure. A detailed documented program must be established to fit each situation and condition.

1) Observe and review all the conditions of the equipment. All sources of stored energy must be recognized, managed, and cautiously released by qualified personnel. Examples:
   - Shutting down truck engines and any auxiliary engines.
   - Disengage power take-off systems.
   - Relieving stored hydraulic or pneumatic pressure after installing any blocking devices.
   - Relieving all entrapped hydraulic pressure.

2) Remove the key from the vehicle ignition.

3) All individuals affected must be notified and comply with the Lockout Procedure.

4) Tag all controls to inform personnel that the equipment is “under repair”, “do not operate”, or whatever the situation dictates. All affected personnel must be previously informed as to the meaning and appearance of the Lockout Tag.

Minimum Requirements For Lockout Tag:

- Tags must be made out of a material capable of withstanding the environment to which they are exposed (Example: oil, grease, fuel, etc.).
- Tags must be easily recognizable and clearly visible at the location of the operating controls.
- Tags used must be standardized with one or more of the following criteria: color, shape, size, and/or format.
5) Only authorized individuals should release the equipment for use after repairs have been made.

6) Periodic inspections should be done by the employer to verify the correct use and compliance with the Lockout Procedure.

! DANGER !

FAILURE TO COMPLY WITH THE LOCKOUT PROCEDURE MAY RESULT IN INJURY TO PERSONS AND/OR DAMAGE TO EQUIPMENT.

NOTE: There are other procedures and responsibilities associated with the Lockout Procedure as dictated by the uniqueness of each situation and any applicable standards and/or codes.

Please note that the procedure basics listed above are to create an awareness of the necessity for a “Lockout/Tagout Procedure”. The owner/employer should obtain a current copy of the following references:

ANSI Z244.1
Federal Code Of Regulations Title 29 Part 1910 Section 1910.147

The Federal Code Of Regulations may be accessed via the internet at the National Archives and Records Administration website at http://www.access.gpo.gov/nara/cfr/

It is ultimately the owner’s/employer’s responsibility to establish, train for, and oversee the implementation of the lockout/tagout procedures.
OPERATING PRECAUTIONS

The following precautions should always be observed:

*Do Not* use chain to hook onto any container, as the hoist has the power to break most chains.

*Never* adjust the hydraulic pressure setting without the use of an accurate working pressure gauge placed in the system on the pressure side of the main hydraulic control valve. **NOTE:** *Do not set the pressure to exceed pressures shown on hydraulic schematic.*

*Operate* one control handle at a time. The control valve is not designed to operate two or more functions simultaneously.

*Do not* alter the hydraulic valves or the hydraulic system in any way without prior approval in writing from the factory.

*Never* use a locking device to hold a control handle or a valve open, as the valves are designed to return to the center when released, allowing a complete stop of movement.

*Check* the cable for excessive wear and replace as needed. **(Cable manufacture recommends changing cable once a year and factor concurs.)** **NOTE:** *It is necessary to change the four cable clamps when replacing the cable.*

*Observe* and *obey* all caution and warning decals on both hoist and containers.

*Always* power the hoist down. Do not let its weight push it down with the PTO disengaged. This may cause air infiltration into the hydraulic system. Damage to the pump by cavitations may occur.

*Never* drive the truck with the P.T.O. engaged.

*Never* drive the truck with the hoist in other than full down position.

*Hydraulic oil* warm up is required in very cold weather. Engage P.T.O. and let truck idle for several minutes.

*Never* allow anyone to work on the hoist in the raised position, without adequate support to prevent the hoist from lowering.

*Never* move the truck unless the container and hoist rear hold downs are engaged.
Never move a truck with the container loaded unless the hoist is down in the over the road travel position. If the unit is equipped with a rear stabilizer, it must be raised up off the ground before moving the truck.

Always drive slowly over rough and bumpy roads to prevent excessive stress on the equipment. Operate the equipment smoothly and slowly.

Your roll-off trailer hoist has been designed to give extended service when used with good working habits. Always operate your roll-off within its rated capacity and follow the suggested maintenance and lubrication program. RESPECT YOURSELF AND OTHERS AND THIS EQUIPMENT. USE GOOD WORKING HABITS AND COMMON SENSE WHEN OPERATING THE HOIST.
### Maximum Container Weight per Hoist Model & Hoist Rated Capacity

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<th>Hoist Model</th>
<th>Maximum Container Weight &amp; Hoist Rated Capacity (LBS)</th>
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Maximum Container Weight per Hoist Model & Hoist Rated Capacity

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RECOMMENDED LOADING PROCEDURE
TAIL TO GROUND HOISTS

The following information is a guideline for operating a tail to ground roll-off-hoist. These instructions do not exhaust every possible situation that could occur when operating the equipment, but are intended to promote efficient and proper operation.

! WARNING!
BEFORE OPERATING THE EQUIPMENT:

1. Be sure the area is clear of people.
2. Check the area for low power lines or any other obstacle which may interfere with hoist operation.
3. Never operate equipment which is damaged and/or improperly maintained. **NOTE: The Smallest Crack Must Be Repaired.**
4. Always operate the equipment within its rated capacity.
5. Study this entire manual and become properly trained with this equipment before attempting to operate this equipment.
6. Respect yourself, others, and this equipment. Use safe working habits and common sense when operating this equipment.

**NOTE**
Failure to follow the items listed above may result in damage to equipment and/or to persons.
LOADING A CONTAINER

1. Illustration 1

Aligning the hoist rails with the long sills on the container, back the truck squarely as possible to the container. Allow 3 - 4 feet between the container and hoist (allow 8 - 9 feet for extendable tail models). Put the transmission in neutral and engage the P.T.O. Extend the tail on extendable tail models.

2. Illustration 2

Raise the hoist until the tail touches the ground. (NOTE: Do not allow the hoist tail to lift the truck up by raising the hoist after the tail is touching the ground.)
3. Illustration 3

Set truck brakes. Retract the winch cylinder and connect the cable to the container hook.

!! DANGER !!
Check to be sure the cable connection is securely attached and in good working condition.

4. Illustration 4

Release truck brakes. Pull the container onto the hoist allowing the truck to roll under the container.

!! CAUTION !!
Be absolutely sure the container long sills are lined up on the hoist properly.
5. Illustration 5

NOTE: Container front roller ahead of hoist rear hinge point.

Illustration 6

NOTE: Container long sills and hoist rails in line with each other.

Continue pulling the container onto the hoist. After the container front rollers are ahead of the hoist rear hinge point, lower the hoist enough to keep the container long sills and hoist rails in line and even with each other.
Lower the hoist when the center of gravity of the container is forward of the rear hinge and continue pulling the container forward until it is securely locked into the front stops.

!!! CAUTION !!!

Do not attempt to power the hoist down before the C.G. of the container is past the rear hinge point of the hoist. This can cause excessive stress, loss of control and/or damage to equipment.
In addition to the front stops, container and hoist should always have a rear container hold-down device. Disengage P.T.O. before driving away.

!! DANGER !!

The container and hoist must be equipped with the proper front stops and rear holddowns. The container specifications must match the hoist specifications. (Ex: Roller size & location, proper style hook up, spacing between long sills, etc.) The container and hoist must be in good working order. Non-compliance could result in damage to equipment and/or injury to persons and is the operator/owner’s responsibility.
RECOMMENDED LOADING PROCEDURE
DEADLIFT HOISTS

The following information is a guideline for operating a deadlift roll-off-hoist. These instructions do not exhaust every possible situation that could occur when operating the equipment, but are intended to promote efficient and proper operation.

! WARNING !
BEFORE OPERATING THE EQUIPMENT:

1. Be sure the area is clear of people.
2. Check the area for low power lines or any other obstacle which may interfere with hoist operation.
3. Never operate equipment which is damaged and/or improperly maintained. **NOTE: The Smallest Crack Must Be Repaired.**
4. Always operate the equipment within its rated capacity.
5. Study this entire manual and become properly trained with this equipment before attempting to operate this equipment.
6. Respect yourself, others, and this equipment. Use safe working habits and common sense when operating this equipment.

**NOTE**
Failure to follow the items listed above may result in damage to equipment and/or to persons.
**LOADING A CONTAINER**
(IS284)

Back hoist squarely up to container 3 to 5 feet away from the container. Lock brakes. Connect cable securely to the container. Put the transmission in neutral and engage the P.T.O.

Release brakes to allow the hoist to roll backwards to the container as the cable is tightened.

Raise hoist 3 to 5 feet.
Pull the container up and over the flange roller on the hoist.
Allow the hoist to roll backwards as the container is pulled onto the hoist. Raise or lower the hoist as needed to maintain a 1/2" overlap of the container nose cone and hoist rails.

Until the C.G. of the container is past the hoist rear hinge point, raise or lower the hoist as needed to keep the container long sills on the hoist rollers.
When the C.G. of the container is past the rear hinge point of the hoist, set brakes and lower the hoist.

**WARNING**

If the C.G. is not forward of the hoist rear hinge point when lowering the hoist, the lift cylinders could fail to pull the hoist down. To correct this situation, raise the hoist and pull the container forward until the C.G. is past the hoist rear hinge point.

Pull the container forward until it is securely locked into the front stops. In addition to the front stops, container and hoist should always have a rear container hold-down device. Disengage P.T.O. before driving away.

**DANGER**

The container and hoist must be equipped with the proper front stops and rear holddowns. The container specifications must match the hoist specifications. (Ex: Roller size & location, proper style hook up, spacing between long sills, etc.) The container and hoist must be in good working order. Non-compliance could result in damage to equipment and/or injury to persons and is the operator/owner’s responsibility.
DUMPING A CONTAINER

! CAUTION ! Before raising the hoist, observe both sides and rear of the hoist for personnel. DO NOT RAISE THE HOIST IF ANYONE IS CLOSE ENOUGH TO BE HIT SHOULD THE HOIST TIP OVER. Also, observe for any personnel that may be heading into the area during the dumping operation.

Review all of the following items as a guideline to perform the dumping operation. These items do not exhaust every situation which may occur, but are intended to promote proper operation when combined with safe work habits and common sense.

1) Dump site - The area should be level, solid, and clear of obstacles. Check for overhead clearances such as power lines.

2) Dumping Loads - In the down position, open the tailgate and secure the door in the open position using the chain provided on the container door. Engage P.T.O. and raise hoist until load slides out.

CAUTION: In the event that all of the load is not discharged or it becomes necessary to move the unit forward, the hoist and container must be lowered to the full down or travel position prior to any forward movement of the truck. Always keep the tires properly and evenly inflated.

UNLOADING A CONTAINER

1) Set truck brakes.
2) Raise the hoist high enough to allow the container to move rearward.
3) Lower the container.
4) Release the truck brakes. Continue lowering the container allowing the truck to roll out from under the container.

! CAUTION ! If the container being unloaded is heavy, feather the control valve to slow the downward movement of the container. Do not allow the front of the container to hit the ground abruptly. Failure to do so can result in damage to the container.
INCORRECT CONTAINER POSITIONING

CONTAINER TO LONG FOR HOIST

FRAME MAY CRACK OR BEND

CONTAINER TO FAR BACK

FRAME MAY CRACK OR BEND

CG TO FAR FORWARD

FRAME MAY CRACK OR BEND

CORRECT CONTAINER POSITIONING

** CG IS APPROXIMATELY 10-12% OF WHEEL BASE IN FRONT OF CENTER POINT OF BOGIE.

NOTE: SCALE EQUIPMENT TO DETERMINE PROPER WEIGHT DISTRIBUTION.
DO NOT OPERATE HOIST WITH THE CABLE IN THIS POSITION.

WHEN OPERATING YOUR HOIST, MAKE SURE THAT THE CABLE RUNS STRAIGHT DOWN THE CENTER OF THE HOIST. BE CAREFUL NOT TO HAVE THE CABLE LOOPED ON THE OUTBOARD SIDE OF THE REAR HOLD DOWN AS ILLUSTRATED.

CAUTION: ALWAYS PULL CABLE UP CENTER OF HOIST. NEVER ALLOW CABLE TO BE PULLED OVER SIDE OF HOIST WHEN WINCHING ON, AS THIS CAN CAUSE THE CABLE TO DESTROY ITSELF OR DAMAGE FRONT SHEAVE.
OPERATION AND MAINTENANCE PRECAUTIONS
FOR PINTLE HOOK APPLICATIONS

Before operating the equipment, inspect for worn, damaged, or missing parts. Inspect the entire pintle hook and surrounding area where it is mounted to the truck for cracks, bends, or any damage. Repair and/or replace the equipment before using.

The towing vehicle on which the pintle hook is mounted must be of a sufficient rated capacity for the trailer utilized and in proper working condition.

The truck air system must be equipped with an air-dryer to prevent dirt and moisture from getting into air valves.

The trailer must have retaining cables or chains hooked to a strong enough attachment capable of holding the trailer should a detachment occur.

Never jack-knife the trailer when dumping, loading, unloading and when backing for any reason. Always keep the trailer and truck in a straight line. Jack-knifing the trailer can cause damage to the pintle hook and/or trailer tongue.

Before moving any trailer, all necessary connections, such as the service and emergency air lines and electrical hookup, must be made. CAUTION: The air pressure must be allowed to build up in the trailer's air reservoir tank(s) before moving the equipment. The trailer brakes should then be checked to ensure proper working condition.

Always drive the equipment slowly over rough and bumpy roads. Always operate the equipment smoothly and carefully.

! WARNING !

The bouncing of the truck suspension is carried backwards to the pintle hook. The pintle hook then becomes a moving force with the impact of a large hammer upward and downward on the trailer tongue eye causing abuse to equipment. Always drive at greatly reduced speeds over rough terrain to minimize this destructive action.
Never exceed the capacity of the pintle hook and/or any equipment utilized.

! WARNING !

Applying the brakes severely increases the weight transferred to the trailer tongue on trailers without front axles. Therefore, products that can shift, such as sludge, water, etc., must never be transported by this type of trailer.

Follow all maintenance instructions, warnings, and general instructions listed on Holland’s specification sheet which is enclosed in this manual.

Be particularly careful not to damage the pintle hook when coupling and uncoupling the trailer.
INTRODUCTION AND PREVENTIVE MAINTENANCE COMMENTS

Maintenance begins with the purchase and use of the correct hoist properly designed for the hoist application. Trained, qualified and competent personnel should perform all operation, inspections, service and maintenance issues.

Galbreath strongly urges each owner/operator set up a “Preventive Maintenance Program” that will provide adequate inspection, servicing and repair of their hoist and it’s components for the purpose of providing safe operation and maximize the service life of this equipment.

NOTE: The suggested preventative maintenance inspection and time intervals may need to be adjusted due to factors such as: severe or heavy usage, muddy or dusty environment, special application, warranty and maintenance history issues.
QUICK REFERENCE PREVENTIVE MAINTENANCE INTERVAL CHART

These inspections are intended to verify that the hoist and its components are in the proper safe operation and are within normal wear guidelines. If there are any items that do not pass your inspection, you must notify your supervisor and a lockout tag must be placed on the equipment as outlined in the “Lockout Procedure Guideline” section of this manual.

**Daily Inspections**
- Hydraulic components
- Hydraulic and air leaks
- Oil level
- Structural components and welds
- Front and rear stops
- Sheave blocks
- Rear hinge
- Pivot Points
- Rollers
- Cable and cable ends
- Control rod or cable linkage
- Nuts & bolts
- Shafts & Cotter keys
- Lamps
- Reflectors
- Electrical wiring
- Back up & hoist up warning systems

**Weekly Inspections**
- Grease all grease fittings (Ref. Lube Charts for grease fitting locations)

**Every Three Months**
- Inspect the condition of hydraulic oil for proper color, odor and feel

**Every Six Months**
- Replace hydraulic oil filter
- Replace air breather

**Every Twelve Months**
- Replace hydraulic oil
- Replace air & hydraulic oil filters
- Clean suction strainer

**NOTE:** Reference “Suggested Preventative Maintenance” section below for additional detailed information.
SUGGESTED PREVENTIVE MAINTENANCE

Lubrication
Proper lubrication is essential to all types of bearings, gearing, and friction producing mechanical devices. Lack of adequate and proper lubrication results in premature wear of components due to increased abrasion or excessive heat. Lubricate unit a minimum of once a week. Reference “Lube Charts” in this manual.

Grease
All grease fittings should be properly greased after 40 hours of service or a minimum of once a week for average usage. Reference “Lube Charts” in this manual.

Hydraulic System
Daily inspect for leaks, loose hydraulic lines and fittings, oil level and proper operation of hydraulic system.

Air Breather
Replace air breather every six months. Reference “Lube Charts” in this manual.

Oil Filter
Replace oil filter every six months. Reference “Lube Charts” in this manual.

Suction Strainer
Inspect and clean suction strainer when changing hydraulic oil.

Hydraulic Oil
Every Three Months: Inspect oil for proper color, odor and feel. Replace oil if milky or darkens in color, begins to have an odor, or lacks lubricity to your touch. Every Twelve Months: Replace oil with ISO32 (AW32) Anti-wear hydraulic oil filtered through the return filter or filter existing oil to ISO Code 18/15 and remove water with water separation media filter (water less than 50 parts per million). NOTE: When replacing or adding oil, always filter the oil through the return filter.

Hydraulic Cylinders
Inspect cylinder rods, fittings and operation. Apply grease to the grease fitting on the hydraulic cylinder every week.
SUGGESTED PREVENTIVE MAINTENANCE (Continued)

MECHANICAL

Structural & Weld Integrity
Check to insure proper and safe working condition of structural members. Make sure it is within normal wear guidelines. Inspect weld joints.

Front & Rear Stops
Check to insure proper and safe working condition of stops.

Nuts, Bolts, Shafts, Cotter Keys, Etc.
Check to insure proper and safe working condition. Make sure it is within normal wear and proper torque guidelines.

Control Rod or Cable Linkage
Check to insure proper and safe working condition. Inspect connections and apply proper lubrication on pivot and wear areas.

Rollers, Sheave Blocks, Rear Hinge, Pivot Points
Check to insure proper lubrication, adjustment and operating functions.

Container Hold Down Devices
Check to insure proper and safe working condition.

Hoist Cable
Daily inspect the cable along with a through inspection every 40 hours for breakage, unraveling or flat spots as well as cable ends, clamps and pins. The cable should be lubricated frequently to prevent rusting.

ELECTRICAL SYSTEM

Reflectors/Lights
Daily inspect all lamps and reflectors. Make sure they are cleaned and in proper working order.

Electrical Wiring
Inspect all visible wiring to see that it is not frayed and is properly supported and protected and that all connections are tight.

Wire Splicing
Use wire connectors with shrink tubing for water-tight connections.

Hoist Up & Back Up Alarms
Check to insure proper and safe operation.

NOTE: Always apply conductive grease in receptacles and in bulb sockets prior to re-assembly.
SEE IS0285 FOR EXPLANATION

R1 REDRAWN ON CAD

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PROCEDURE FOR DISASSEMBLING & REASSEMBLING
SINGLE STAGE CYLINDERS

The sectional drawing of this cylinder assembly will indicate many obvious procedures for the disassembly of the various components, for the replacement of seals and for the reassembly of the cylinder. Ordinary precautions to prevent damage to metal parts and to seals are required. Special care should be taken to protect the finishes of both the piston rod and cylinder bore as seal life is greatly dependent upon the smooth finishes of these surfaces. Sectional drawing available upon request.

1) Hold the cylinder secure as to prevent it from turning while you are removing the head. **Never clamp on the barrel at the head end of the cylinder assembly with an ordinary two jaw vise.** This may cause binding and/or galling of one or both parts in the area of the threaded head. Clamp at the cap end of the cylinder assembly while supporting the weight of the cylinder assembly.

2) Fully extend the piston rod. This expels the oil from the retract side of the cylinder and also simplifies manual withdrawal of the rod piston sub-assembly from the barrel. Air pressure may be used to extend the rod by attaching your air supply line to the extend port of the cylinder. **CAUTION:** Slowly apply the air to maintain control of the extending rod and piston sub-assembly. Also, drain the oil from the retract port of the cylinder to reduce a chance of an oil spill. Once the rod is extended, use caution when disconnecting the air from the cylinder extend port.

3) Using the spanner wrench, back out the threaded head from the barrel assembly by turning counter clockwise. The entire rod and piston sub-assembly may now be withdrawn for the barrel assembly bringing with it the head nut assembly.

4) With the rod and piston sub-assembly held secure to prevent it from turning, use the spanner wrench to remove the piston from the rod. **CAUTION:** Do not clamp on the polished surface of the rod without providing protection to the polished surface.

5) Remove the piston then the spacer and the head nut from the rod by sliding each over the threaded end of the rod being careful not to damage the threads.

6) Remove the old seals and bearings. All parts should be thoroughly cleaned. While cleaning, inspect all components for rough wear and determine whether the part can be cleaned up or replaced. Seals and bearings can then be installed in their respective grooves. The continuous piston seal ring can be stretched slightly with the use of the rounded blade screwdriver. This seal should then be pushed in place by hand. Careful reference to the drawing will show the proper installation of the seals noting the direction of the seal lips, etc.
7) The piston and rod sub-assembly can now be reassembled. Using a liberal amount of grease on both the inside diameter of the head and the surface of the rod, slide the head over the threaded stem end of the rod being careful not to damage the seals. Next install the spacer. Wipe the threads clean of any grease and apply Locktite #242 to the rod stem threads. Start the piston on the rod stem and tighten with the spanner wrench. Torque the piston to 2000 ft. lbs. or as much as you can possibly torque.

8) Apply grease to the piston and the inside threads of the barrel and insert the piston and rod assembly into the barrel. Take special care to avoid scraping the piston bearings and seals on the barrel threads. With the piston inserted about halfway into the barrel, slide the head into position in the barrel. With the spanner wrench, screw the head into position. Once the head has bottomed out into the barrel, tap the end of the spanner wrench with a mallet to insure proper penetration and tightness.

9) The cylinder can now be cycled with hydraulic pressure and tested for external and internal leaks along with proper function.
Packing Gland Removal
For Cylinders 1031 & 1043

Step 1: Remove Retainer Ring using spanner wrench in counter clockwise motion as shown (Fig. A).
Step 2: Remove Inside Assembly by pulling out Piston Rod.
Step 3: Replace Seals as indicated in (ISO308) or (ISO310). It is a recommended practice to cover all internal parts with a film of oil before assembly.
Step 4: To reassemble Cylinder, replace Piston Rod Assembly and gland. Replace new retaining ring using spanner wrench in a clockwise motion as shown (Fig. B).
PACKING GLAND REMOVAL
FOR CYLINDERS 2477, 1040, 2462, 1054, 2463 #1126

STEP 1: REMOVE FIVE CAP SCREWS AND OUTSIDE RETAINING PLATE AS SHOWN (FIG. A)
STEP 2: USING A HAMMER AND BRASS OR SOFT METAL PUNCH, TAP PACKING GLAND BACK TO EXPOSE RETAINING RING AS SHOWN (FIG. B).
STEP 3: REMOVE RETAINING RING WITH SCREWDRIVER AS SHOWN (FIG. C).
STEP 4: BOLT TOOL NO. 314AD TO PACKING GLAND WITH CAP SCREWS FROM STEP 1, MAKING SURE END OF TOOL PROPERLY FITS INTO AND ON CYLINDER ROD END AS SHOWN (FIG. D).
STEP 5: TURN HANDLE CAREFULLY IN A CLOCKWISE DIRECTION UNTILL PACKING GLAND IS OUT OF CYLINDER ROD AS SHOWN (FIG. E).
STEP 6: TURN SCREW ON TOOL IN COUNTER-CLOCKWISE DIRECTION TO RELEASE PACKING GLAND, THEN REMOVE CAP SCREWS AS SHOWN (FIG. F).
PACKING GLAND REMOVAL

STEP 1: REMOVE SNAP RING USING SCREWDRIVER AS SHOWN (FIG. A).
STEP 2: PUSH PACKING GLAND INWARD UNTIL THE BACH RETAINER INSERTS ARE FREE (FIG. B).
STEP 3: PULL OUT ON PISTON ROD UNTIL PISTON PUSHES PACKING GLAND TO OUTSIDE OF CYLINDER BODY (FIG. D & E).
STEP 4: REPLACE SEALS AS INDICATED ON (IS0315) IN THIS MANUAL. IT IS A RECOMMENDED PRACTICE TO COVER ALL INTERNAL PARTS WITH A FILM OF OIL BEFORE ASSEMBLY.
STEP 5: TO REASSEMBLE CYLINDER, PUSH PISTON ROD AND GLAND ASSEMBLY BACK INTO CYLINDER BODY. REPLACE TRIPLE-LOCK RETAINER, PULL BACK ON PISTON ROD ASSEMBLY AND REPLACE SNAP RING.
**WARNING:** NEVER USE AIR PRESSURE TO TAKE CYLINDER APART. TO REPLACE PACKING KIT FOLLOW STEPS 1, 2, 4, AND 6. TO REPLACE COMPLETE SEAL KIT FOLLOW STEPS 1 THRU 6.

**STEP 1:** REMOVE BLEEDER SCREWS. PULL CYLINDER ROD END OUT A FEW INCHES AND GRIP THE BARRIER WITH A STRAP WRENCH TO PREVENT SCORING (FIG. B).

**STEP 2:** UNSCREW GLANDS BY TURNING COUNTER CLOCKWISE. USE A STRAP WRENCH AND A SPANNER WRENCH (FIG. A & B).

**STEP 3:** PULL STAGES COMPLETELY OUT TO REPLACE PISTON RINGS. INSPECT ALL INSIDE AND OUTSIDE CYLINDER BARRELS FOR SCRATCHES. LIGHT SCRATCHES CAN BE REMOVED BY POLISHING WITH CROCUS CLOTH.

**STEP 4:** TO REASSEMBLE THE CYLINDER, USE A RING COMPRESSOR ON PISTON END TO PREVENT BREAKING RINGS OR DAMAGING THREADS.

**STEP 5:** REPLACE PACKING IN GLAND. APPLY THREAD SEALER TO THREADS AND REASSEMBLE GLAND BY TURNING CLOCKWISE.

**NOTE:** BLEED AIR OUT OF CYLINDER BEFORE TIGHTENING BLEEDER SCREWS.
PROCEDURE FOR DISASSEMBLING AND REASSEMBLING TELESCOPIC CYLINDERS

STEP 1

The cylinder is best serviced mounted in the vertical position, for both disassembly and assembly. Also, it is best located where a hoist can be used directly overhead of the cylinder for removing the plungers if complete disassembly is required. A typical stand is shown in Figure 1, made of angle welded to a base anchored to the floor and an adjustable wrap around chain to secure the cylinder to the stand. Because of oil spillage and safety, we recommend draining the cylinder of oil before disassembling. Lay the cylinder horizontally with the port down and open. Rotate the last plunger so the bleeder hole is on top and open.

Figure 2 shows a typical sequence of disassembling the cylinder plungers in steps which are further described in this manual.
STEP 2

All head nuts are secured to the plunger by a set screw. Under the set screw is a nylon slug to protect the plunger threads. To remove the head nut the set screw must be loosened using an Allen wrench.

STEP 3

After the set screws have been loosened, tap head nut gently around its circumference, and unscrew the head nut with a chain wrench, or an equivalent tool. Do not use a chisel, punch, or weld any studs to the head nut to remove.

Figure 3

Figure 4

Typical tool end shapes for removing remaining parts, bushing, packing, retaining rings, and spacer.

Figure 5

Figure 6

Figure 7

Used For:
Removing Bushings (Fig. 8)
Removing Retaining Rings (Fig. 10)
Installing Packing

Used For:
Removing Packing (Fig. 9)
Removing Retaining Rings (Fig. 10)

Used For:
Removing Spacer (Fig. 11)
STEP 4

Insert a screwdriver (Fig. 5) into the groove around the outside of the bushing. Tap gently upward with a mallet uniformly around the circumference of the bushing.

STEP 5

Use a tool similar to (Fig. 6) and jam the hooked type tool past each ring, twist and lift out each ring individually. Discard the packing, since the sealing lips of the V-rings may be damaged. When removing the packing, care must be taken not to scratch or score the packing bore or plunger.
STEP 6

Using a tool shown in Fig. 6 insert the hooked end into the retaining ring slot. Force the retaining ring partially out of the groove. With the second tool shown in Fig. 5 work the end of the tool under the end of the ring partially out of its groove. Working both tools together, unwind the retaining ring out of the cavity.

STEP 7

Using a tool shown in Fig. 7, insert the tool between the spacer and plunger. Hook the bottom of the spacer. As you lift the spacer, tap the plunger with a soft mallet and work the spacer up and out of the cavity. Repeat Step 6 to remove second retaining ring. The plunger is now free to lift out. The plunger stop will come out with the plunger.

REASSEMBLY OF CYLINDER

All bores in the packing area and plunger outside diameters must be free of tool marks and scratches. Polish with a fine paper, crocus cloth or a Scotch Brite pad. All parts should be clean and free of any contamination. A complete Major Repair Kit as called out on Page 7 (ordering information) is recommended. Drop all plungers into the body in the vertical position, as shown in Figure 1. Assemble the remaining parts in the reverse sequence as listed in Figure 2. The packing should be presoaked in oil before installing. (Do not use a detergent oil) Note Figure 2 for the direction of the packing. Using a tool similar to Figure 5, seat each lip individually, making sure packing is nestled uniformly. After the head nuts are adjusted, make sure there is a nylon slug under the set screw before securing the head nut to the plunger. After installing the cylinder in the unit, crack the bleeder screw open and extend the cylinder to bleed the air. More than one extension may be needed to assure all the air is removed and cylinder operates smoothly.
PROCEDURE FOR ADJUSTING HEAD NUTS ON TELESCOPIC CYLINDERS

WARNING! Before making adjustments or repairs to the cylinder when mounted in the unit use strong, heavy, positive, supports to hold the body from accidentally lowering.

NOTE: Pressure must be relieved in cylinder before attempting to adjust head nuts.

A) For leaking Cylinders:
   Step 1) Loosen set screw in head nut.
   Step 2) Tap head nut lightly around circumference with a hammer.
   Step 3) Using a chain wrench back head nut off one half to one full turn. If plunger turns as you are turning head nut the plunger will have to be held, preferably with a strap wrench.
   Step 4) Cycle cylinder two or three times. This will help to seat any vee rings that might be rolled.
   Step 5) Tighten head nut one half turn further than it was loosened.
   Step 6) Tighten set screw.

B) For Mis-sequencing Cylinders:
   Step 1) Loosen set screw in head nut.
   Step 2) Tap head nut lightly around circumference with a hammer.
   Step 3) Using a chain wrench back off head nut of sticking plunger one half turn. If this does not help, turn head nut another half turn. If plunger is still sticking tighten next plunger that is extending. If plunger turns as you are turning head nut the plunger will have to be held, preferably with a strap wrench.
   Step 4) Tighten set screw.

If adjustments fail to correct the problem, contact the factory for further instructions.

AUTOMATIC BLEEDER SCREW FOR TELESCOPIC CYLINDER

The automatic bleeder valve eliminates time consuming and hazardous air-bleeding maintenance and problems common with hydraulic systems with entrapped air.

1. To Close, turn cap clockwise all the way in.
2. For Automatic Bleeding, turn cap counter clockwise all the way out. The proper operation necessitates a clean hydraulic system. With each lifting cycle of the cylinder, a small amount of fluid will be discharged through the valve, which is normal and does not constitute a faulty air bleeder valve assembly.
3. For Manual Bleeding, cap is approximately one turn off the closed or bottomed out position.
FLUSHING THE HYDRAULIC SYSTEM

This procedure tells how to properly flush oil from the hydraulic system on all standard two cylinder winch cable model truck mounted hoists. (Ex. U2, U3, U4, U5, U6, UT, UM, UX)

Before starting the following procedures, make sure that all hydraulic cylinders are retracted completely.

1) Shut gate valve, located at bottom inside of the oil tank, and close the valve by turning the knob clockwise. Remove the suction line at the gate valve and drain oil from tank using the gate valve to regulate the flow.

2) Once all the oil has drained out, remove the suction strainer which is located in the tank where the gate valve is. With the strainer out, clean with a solvent by flowing the solvent from the inside of the strainer out. After cleaning, check that the relief valve in the end of the strainer is operational. It should push inwards with about 3 pounds of pressure.

3) Remove the return filter and replace it with a new filter. DO NOT REUSE THE OLD RETURN FILTER. Reinstall return filter and suction strainer using appropriate thread sealant and/or “O” rings. The “O” rings need to be checked for nicks or cuts before reinstalling. Also reinstall the suction hose to the gate valve. OPEN GATE VALVE (COUNTERCLOCK WISE) FULLY.

4) Trace down the retract line to the main control valve from the lift and winch cylinders. Mark the lines so that they don’t get crossed when you reconnect them to the control valve. Disconnect the retract lines at the main control valve and place the lines in an appropriate sized container or add enough hose to the retract lines that they can reach into a 55 gallon drum.

5) Fill the oil tank with AW32 or equivalent type hydraulic oil so that it just comes to the top of the sight gauge mounted on the oil tank.

6) Start up the truck and engage the PTO. With the truck idling and the PTO running, activate the main control valve lever to “extend” or “on” for the winch cylinders. This will force the oil out of the retract hoses that are disconnected and flush the old oil out. When the winch cylinders are completely extended, shut the truck off and reconnect the retract hose for the winch cylinders back on the main control valve. Start the truck again, engage the PTO and retract the winch cylinders completely. Check the oil level in the tank and fill to the top of the sight gauge again. Before starting step 7, determine if you have telescopic lift cylinders or single stage lift cylinders. UT, UM, UX and some U5 model hoists have telescopic or multi state cylinders. If you have telescopic (multi stage) lift cylinders, proceed to step 8.
7) For single stage lift cylinders, with the retract hose in a container or 55 gallon drum, activate the main control valve lever for the lift cylinders to extend or raise the hoist. This will force the old oil out of the lift cylinders. When the lift cylinders are fully extended and raised, shut off the truck and reconnect the retract hose to the main control valve. Start the truck, engage the PTO and lower the hoist to retract the lift cylinders. Check the oil level and add if necessary. Cycle the cylinders for the winch and lift to purge any remaining air out of the system. Check for leaks and correct oil level.

8) For multi state (telescopic) lift cylinders, first locate the hoses at the base or bottom of the lift cylinders. Mark them in a way to identify retract and extend (colored bread ties work well) for ease in reconnecting later. Disconnect the hoses at the base of the cylinders so the oil can drain in a 5-gallon bucket. When both lift cylinders are drained, reconnect the hoses to their respective ports. Opening the bleeder screws on the tops of the cylinders will speed up the draining process. Reconnect the retract hose at the main control valve for the lift cylinders. Double check all the hose connections that were mentioned in step 4. Fill the oil tank to 1/2 to 1 inch from the top of the sight gauge. (Be sure to tighten bleeder screws before start up.)

9) Start up truck and engage PTO. At an idle, operate the main control valve lever to the “retract” or “lower” position until the cylinders are full and the hydraulic system is dumping over the relief valve. Now move the lever to the raise position to raise the hoist approximately 12 to 18 inches above the subframe. At this time, using the bleeder screws, bleed out any air trapped in the cylinder. Once pure oil comes out of the bleeders, tighten the bleeders and cycle the hoist to full up and full down several times. This will finish purging any existing air trapped in the lift cylinders. Lower hoist and check the oil level in the oil tank. Refill if necessary and check for leaks.

Conserve resources and recycle the hydraulic oil. Always dispose the oil properly. If you have any questions pertaining to the procedures involved, please contact the Customer Service Department at Galbreath Inc. 800-285-0666
MINIMUM RECOMMENDED TRUCK SPECIFICATIONS*

18,000# Front Axle With Power Steering
44,000# Rear Axle With Walking Beam Suspension
Bending Moment For Each Frame Channel 2,400,000 in. lbs.
36,000 P.S.I. Chassis Frames - Minimum Section Modulus 32 in.³
55,000 P.S.I. Or More Chassis Frames - Section Modulus 24 in.³

NOTE: CHECK LOCAL REGULATIONS

*OPERATOR IS RESPONSIBLE FOR COMPLIANCE WITH LOCAL, STATE & FEDERAL WEIGHT REGULATIONS.

!! CAUTION !!

THIS EQUIPMENT SHOULD BE OPERATED BY PROPERLY TRAINED PERSONNEL. THE HOIST SHOULD NOT BE USED TO LIFT AND HAUL ANY WEIGHT THAT IS BELIEVED TO EXCEED THE LOAD RATING OF ANY OF THE INDIVIDUAL COMPONENTS OF THE ENTIRE PIECE OF EQUIPMENT (EX: HOIST, TIRES, TRUCK CHASSIS, SUSPENSION...ETC. IMPROPER USE, MISUSE, OR LACK OF MAINTENANCE COULD CAUSE INJURY TO PERSONS AND/OR DAMAGE TO PROPERTY.
RECOMMENDED TRUCK CHASSIS REQUIREMENTS

NOTE: (1) "H" DIMENSION IS 35" ON (HH) SERIES, ALL OTHERS ARE 35 1/2".
(2) "E-MAX" DIMENSION FOR (GR & ID) MODELS ONLY.

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NOTE: IF THE ABOVE CHART INDICATES A POSSIBLE TRUCK TO HOIST CLEARANCE PROBLEM, INVESTIGATE THOROUGHLY BEFORE MOUNTING HOIST.

*INCLUDES 3RD AXLE
Truck Preparation And Hoist Mounting Procedure

If the truck body (chassis) meets all of the recommended requirements, the following procedure should guide the installer to properly mount the hoist.

**CAUTION:** Some manufacturers and makers of trucks will require “customized” installation techniques to be utilized. A qualified individual must analyze all stress forces acting upon any customized construction so as to not create the possibility of a failure or dangerous situation.

**NOTE:** Any unremovable obstacle such as a muffler, air tank, battery box, etc., must be considered as cab. There must not be any protrusions above the truck chassis frame.

**STEP 1.** Carefully check the “Recommended Truck Chassis Requirements” and “Minimum Recommended Truck Specifications” to assure proper clearance and strength before mounting hoist. Inspect for any obstacles such as air tanks, air dryers, fuel tanks, fuel filters or brackets which may have to be relocated to provide clearance for lift cylinders, controls, tool box, oil tank, lower lift brackets, and other options such as 3rd lift axle. The lift cylinders require a minimum 2 1/2” clearance around their path of operation. The oil tank mounting bracket requires 30” minimum clearance between the back of the cab and the front edge of the tank mounting bracket. This clearance is required for the valve and valve controls.

**STEP 2.** After it has been determined that the hoist will fit the truck frame, including any and all optional equipment, cut the rear of the truck frame off behind center of rear most axle. (IS4121, Fig. A, IS4122, Fig. E, Fig. F) The frame should be torch-cut at a 90° angle to the truck frame for “EX-HH-DL-OR-IX-EH” Models. For “Si” Models, see IS4122, Fig E and for “MM & IH” Models, see Fig. F. Then grind the top edge of truck frame corners to allow room to weld and fit to hoist frame. (IS4121, Fig. C, IS4122, Fig. E, Fig. F)

**STEP 3.** Mount oil tank mounting brackets to truck frame with six 1/2” bolts. NOTE: Use existing frame holes whenever possible for mounting brackets (IS4120, Fig. B) Located 30” from back of cab, fuel tank or battery box. Install other options, ie, 3rd axle, tarper gantry, behind cab oil tank, etc.

**STEP 4.** Insert two (2” x 84”) pipes through oil tank mounting brackets and pump hanger bracket. (IS4121, Fig. D) Note various positions available for mounting pump hanger bracket.

**STEP 5.** Place hoist squarely on truck frame and clamp in place. Recheck for any clearance problems.
FOR "SI" MODEL HOISTS ONLY

FIG. E

CENTER OF REAR MOST AXLE

GRIND AT 30° ANGLE TO ALLOW FOR WELDING

12" 11"

FOR "MM" & "IH" MODELS ONLY

FIG. F

CENTER OF REAR MOST AXLE

GRIND AT 30° ANGLE TO ALLOW FOR WELDING

5 1/4"

4 5/8"

25'
STEP 6. Weld the hoist subframe apron to the ends of the truck frame, outside and inside. (IS4120, Fig. G) A continuous up-weld, minimum of 3 passes (min. 3/8 fillet), is required. NOTE: It is recommended to tack weld first, and then recheck for squareness before welding solid. This will reduce the possibility for the hoist frame shifting as the welds cool. **CAUTION:** Never weld across the truck chassis frame flange upper or lower.

STEP 7. Slide lower lift bracket (2375W) into space under hoist sub-frame. Locate lower lift bracket from upper lift bracket according to proper dimension A. (IS4120, See Chart) NOTE: Usually there are existing holes in truck frame that must be utilized. (Crossmembers, Brake Valves, Etc.)

STEP 8. Before drilling lower lift bracket into place, install the lower lift bracket shaft. There must be a minimum of 5” clearance between the spacer pipe and truck drive shaft. If 5” clearance is not obtainable with the standard shaft, a drop center shaft is available from the factory. (IS4116, Fig. H & I)

STEP 9. If the drop center shaft is to be used, remove one lower lift bracket, install drop center shaft, replace lower lift bracket, reset measurement, clamp, drill, and bolt to side of truck frame. The standard straight shaft may be installed by sliding straight through spacer pipe and lower lift plates. Drill 5/8 holes and torque all 5/8 (Grade 5 or better) mounting bracket bolts to 150 ft. lbs.

STEP 10. Weld lower cylinder shaft pipe securely as shown in IS4116, Fig. I and center hoist sub-frame to lower lift bracket as shown in Illustration III, Fig. H & I. Weld as illustrated. **NOTE:** Occasionally, due to variations in truck chassis, it may become necessary to use alternate hardware parts such as bolts, pipe and fittings, hoses, etc. If such conditions arise, good mechanical judgement should be exercised and alternate parts must be purchased by the installer. **NOTE:** When installing the 2348W drop shaft, after shaft is positioned, weld anti-rotation blocks to the inside of the lift plate. **Do not weld shaft to lift plate or to anti-rotation blocks.**
**TABLE OF MEASUREMENTS**

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*NOTE: THE "MM" SERIES, U4-1H-156, U5-1H-156 HOISTS ARE 66 3/32".*
STANDARD STRAIGHT SHAFT

WELD TO SUB FRAME

LIFT PLATE ASSEMBLY
PART #2375W

WELD 1/4" CONTINUOUS
BOTH ENDS

3" PIPE

TORQUE TO
150 FT. LBS.

WELD COLLAR
610 FOR 3 STAGE
770 FOR 2 STAGE

* 75,000 LB RATED MODELS TORQUE TO 330 FT. LB.

DROP CENTER SHAFT

WELD TO SUB FRAME

LIFT PLATE ASSEMBLY
PART #2375W

1X2 A36 4 FLAT BAR
(100A36-2-4)
ANTI ROTATION BLOCK

TORQUE TO
150 FT. LBS.

DO NOT WELD SHAFT
1X2 A36 4 FLAT BAR
WELD TO LIFT PLATE

DROP CENTER LOWER CYLINDER SHAFT
PART #2348W

FIG. I
**P.T.O. & Pump Mounting Instructions**

**STEP 11.** Slide lift cylinders onto upper and lower mounting shafts and bolt on collars using spacer washers (1 inside cylinder & 2 outside) on narrow frame trucks. Washers used on lower shaft only.

**STEP 12.** Install P.T.O. by the Manufacturer's Instructions and supplied with the P.T.O.

**CAUTION:** The Power Take-Off selection should be done with care. For Diesel Engine, the P.T.O. should be 85% to 100% of engine R.P.M. For Gas Engine, the P.T.O. should be 65% to 80% of engine R.P.M. The torque required is 110 ft. lbs. minimum.

Proceed with the next two steps referring to IS-274 (Figure J).

**STEP 13.** If installing a direct mount pump, install pump to P.T.O. and install pump support bracket from the pump to the transmission housing. Typical mounting brackets, such as 4031BO, 4032BO, 4035BO, may be used. Reference parts section of this manual for additional information. Proceed to Step 15

If installing a drive line pump, establish the best method for installing hanger bracket and weld pump mount to bracket to obtain the shortest practical length of P.T.O. to pump drive shaft.

**CAUTION:** The drive shaft is not to exceed 36” without the use of a center support bearing.

**STEP 14.** Use a standard universal joint on the P.T.O. end and a slip universal joint on the pump end. Cut the P.T.O. shaft to length and cut key way at proper location.

**CAUTION:** Be sure universal joints are in Phase (See Fig. J). Lubricate the slip yoke on installation. Tighten set screws on the other three yokes and lock with wire.

**NOTE:** The next section of assembly instructions deals with the hydraulic power pack and its component parts. Be sure to clean all hydraulic parts, hoses tank, etc., before assembly and use. Keep hoses covered and other holes plugged before use.

**STEP 15.** Install oil tank & valve assembly onto oil tank mounting pipes. Tighten set screws.

**STEP 16.** Establish “Pressure” & “Inlet” ports on pump. (Will vary with direction of P.T.O. Rotation. Fig. K, IS-276)

**STEP 17.** Connect inlet port of the pump to gate valve on tank using 2” low pressure hose.
FIG. J

CAUTION: UNIVERSAL JOINTS MUST BE IN PHASE

PROPER SHAFT LENGTH IS THIS LENGTH LESS 3 1/2'

CAUTION: DO NOT EXCEED 36' WITHOUT USING A CENTER CENTER SUPPORT BEARING.

FIELD INSTALLED KEYWAY

NOTE: KEYWAYS MUST BE IN LINE
STEP 18. Install 1” pressure hose from valve to pressure side of pump.

STEP 19. Connect lift cylinder hoses & valve to hoist piping hoses.

STEP 20. Install rear bumper (IS0277, Fig. L). Make sure it is level and welded securely as shown (IS0277, Fig. M). Weld with five 3” welds on top and underneath the bumper where it contacts the hoist apron.

STEP 21. Install hoist props (IS0968-1).

STEP 22. Locate reflectors and lights according to State and Federal Laws. (Fig. M above is one suggested arrangement of rear lighting)

**Hoist Start-Up Procedure**

**WARNING:** DO NOT ATTEMPT TO OPERATE THE HYDRAULIC SYSTEM BEFORE FILLING WITH OIL.

STEP 23. Grease all working points on hoist. (See Lub. Charts)

STEP 24. Refer to oil capacity chart for volume suitable to hoist model (See page H:12).

STEP 25. Fill the hydraulic system with an (ISO32) AW 32 Antiwear hydraulic oil filtered through the return filter.

STEP 26. Recheck clearances before raising hoist.

STEP 27. Slowly cycle all cylinders and add balance of oil required.

STEP 28. Check clearances with hoist in raised position.

STEP 29. Cycle single stage cylinders at least twice to purge air from system. Air must be bled from telescopic cylinders through bleeder screw located at the top of the cylinder tube section if cylinders have bleeder screws.

STEP 30. Set relief pressure as listed on hydraulic schematics. Nominal setting at 1850 P.S.I.

STEP 31. Set any required adjustable port relief as listed on the hydraulic schematic.

STEP 32. All hydraulic connections and components should be checked for leaks under pressure.
STEP 33. Additional mounting information can be found in the parts section of this manual such as:

- Typical Hydraulic Systems
- Hydraulic Schematics
- Individual Components Including Mounting Notes
- Optional Equipment Inserts

<table>
<thead>
<tr>
<th>MINIMUM OIL REQUIRED FOR OPERATION</th>
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<tr>
<td>MODEL</td>
</tr>
<tr>
<td>All Except (U-194,UX, &amp; UT)</td>
</tr>
<tr>
<td>All (U-194)</td>
</tr>
<tr>
<td>All (UX)</td>
</tr>
<tr>
<td>All (UT)</td>
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<table>
<thead>
<tr>
<th>MAXIMUM OIL TANK CAPACITY</th>
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<tbody>
<tr>
<td>(ALL MODELS)</td>
</tr>
<tr>
<td>To fill oil tank to maximum capacity, proceed thru Steps 23 thru 29. Retract cylinders and fill tank 2” from top.</td>
</tr>
</tbody>
</table>
STEP 20. INSTALL REAR BUMPER (FIG. L). MAKE SURE IT IS LEVEL AND WELDED SECURELY AS SHOWN (FIG. M).

STEP 21. LOCATE REFLECTORS AND LIGHTS ACCORDING TO STATE AND FEDERAL LAWS. (FIG. M ABOVE IS ONE SUGGESTED ARRANGEMENT OF REAR LIGHTING.)
HOIST MODELS

| DIM. "A" | 92" | 99 1/4" | 105" | 110" | 118" | 140" | 145" | 131" |
| DIM. "B" | 90" | 97" | 103" | 108" | 116" | 138" | 143" | 129" |

WELD HOIST PROP SADDLE TO HOIST FRAME #1087W

HANDLE #E247 WELD INTO POSITION AFTER INSTALLING PROP

USE SPACER IF NECESSARY

HOIST PROP #1088W LOCATE TO MISS LIFT CYLINDER IN RAISED POSITION

RESTING HOOK #E612 TO BE LOCATED AFTER HOIST PROP INSTALLATION

NOTE: SOMETIMES THE FENDER IS USED PARTICULARLY ON THE U-174 MODEL

R7 ADDED SS10 MODEL HOISTS
R6 ADDED U75 & WC MODEL HOISTS

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REF. 7041AD

DO NOT SCALE DRAWING

HOISTS H1

HOIST PROP MTG. INSTRUCTIONS FOR TANDEM AND 3RD AXLE

INCORPORATED WINamac, INdiana

10/11/01 R7 GB
08/29/01 R6 GB

ECN DATE NO. BY

18

06-10-86

ISO9668
### Parts List (Reference Only)

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<td>CLAMP (TOP)</td>
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<td>63LN11G5</td>
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</tr>
<tr>
<td>6</td>
<td>WASHER, 5/8 GS USS</td>
<td>63WG5US5</td>
<td>2</td>
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</table>

Parts may be referenced to appropriate subframe Assy drawing.

**NOTE:**

This mounting arrangement is intended to allow movement.

Shim thickness requirements may vary other shims are to be furnished by installer.

Occasionally installer may need to burn hole longer to properly align.

Do not weld.

Push tight against truck frame to prevent subframe from moving sideways.

Hold back to clear radius. Installer to torch cut as necessary.

---

**R2 Redrawn on Acad**

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<table>
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<table>
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<tr>
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<th>R2</th>
<th>RBW</th>
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</thead>
</table>

**DATE** 10/21/85

**Hoists H**

Front mounting clamp

Roll-off hoist

**Incorporated Winamac, Indiana**

**Book No.** 18

**No.** IS0946
SUB-FRAME PLUMBING

VALVE LAYOUT TOP VIEW
FOR LEVER & CABLE

8 TANK

4 1 0
2 3 0
5 6 0

VALVE LAYOUT TOP VIEW
FOR AIR CONTROLS

8 TANK

4 1 0 0
1 2 0
5 5 0

PRESSURE INLET

CTR CLOCKWISE CLOCKWISE PUMP ROTATION FIG. K

EXRENDABLE TAIL MODELS ONLY

1. (HOSE 3/4FJ 45L IMJ 3/4 X 50) 48160-50 - AUXILIARY (TAIL RET.)
2. (HOSE 3/4FJ 45L IMJ 3/4 X 50) 48160-50 - AUXILIARY (WINCH EXT.)
3. (HOSE 3/4FJ 45L IMJ 3/4 X 50) 48160-50 - WINCH EXT. (WINCH RET.)
4. (HOSE 3/4FJ 45L IMJ 3/4 X 50) 48160-56 - LIFT RET. (LIFT EXT.)
5. (HOSE 3/4FJ 45L IMJ 3/4 X 56) 48160-56 - LIFT RET. (LIFT RET.)
6. (HOSE 3/4FJ 45L IMJ 3/4 X 56) 48160-56 - LIFT EXT. (LIFT EXT.)
7. (HOSE 1RM-RM X 56) 339380-56
8. (HOSE LP 1W 1 1/4 X 4B) 4099-48

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H:16
Hoist Up Warning Signal

As standard equipment, a visual warning light to indicate when the lift frame is elevated should be mounted in the cab. This visual warning light shall be located within the driver’s scan. Galbreath Inc. does not recommend connecting this warning light to the existing back up alarm unless the back up alarm has two distinct audible sounds, one for the back up warning and one for the hoist up warning.
STANDARD ICC BUMPER PLACEMENT
FOR OR & ID MODEL HOISTS

ICC BUMPER FOR OR & ID HOIST WITH FRAME HEIGHTS UNDER 44" (2120W)
ICC BUMPER FOR OR & ID HOIST WITH FRAME HEIGHTS OVER 44" (2361W)

NOTE: POSITION AND WELD ICC BUMPER IN PLACE
24" FROM REAR OF HOIST
AS SHOWN.

GROUND

30" MAX. (NO LOAD)

24" MAX.

NOTE: FOR OPTIONAL BUMPERS SEE INSERT PAGES
AT THE BACK OF THE MANUAL.
Starting in June of 2001, we will begin putting retroreflective sheeting on our hoists in conformance with the new ANSI Z245.1-1999 standards for hoists. The new ANSI standard requires a minimum of a 2” wide white retroreflective sheeting in a “L” pattern on the upper left and upper right corners of the back of the truck cab (See Figure 16). Each leg of the white retroreflective sheeting “L” must be 12” in length (See Figure 17). In addition to the white sheeting, the standard also requires a minimum of a 1 1/2” wide red and white retroreflective sheeting to be placed the full length of the ICC bumper as viewed from the rear (See Figure 16). The last part of the retroreflective sheeting standard requires a minimum of a 2” wide red and white retroreflective sheeting along more than one half the length of the hoist sides (See Figure 16). We will use 3” wide red and white retroreflective sheeting on the sides of all of our hoists per Waste Management specifications. The side sheeting can not be blocked by a container and/or other obstructions or be placed higher than 60” from the ground. Broken strips of sheeting on the side of the hoist need to be placed as even as possible. The gaps between the broken strips of sheeting must be less than four feet in length. The edge of white or red sheeting shall not be located closer than 3 inches to the edge of the luminous lens area of any required lamp.

All sheeting must meet the requirements of ASTM D 4956-90, Standard Specification for Retroreflective Sheeting for Traffic Control, for Type V sheeting, and shall meet the minimum photometric requirements contained in the U.S. Code of Federal Regulations, 49 CFR Part 571.108. Reference ANSI Z245.1 – 1999 section 7.2.16.

See next page for Figure 16 & Figure 17

**Minimum Widths of Retroreflective Sheeting that can be used.**

- 1 1/2 inches (Grade DOT-C2) – ICC Bumper Only
- 2 inches (Grade DOT-C2) - 9936
- 3 inches (Grade DOT-C3) - 3793 (White), A2867 (Red & White)
- 4 inches (Grade DOT-C4)

BULLETIN #011701-2
Figure 16 — Roll-off (hoist-type) vehicle markings

Figure 17
NOTCH OUT HERE FOR AIR BRAKE CHAMBERS WHEN NECESSARY.

CENTER OF REAR AXLE TO INSIDE OF PINTLE HOOK 2 3/8".

NOTE: CLEARANCE BETWEEN TIRE & BUMPER MINIMUM 2 1/2".

NOTE: ITEM 21 6668 REPLACES 567 (SIDE GUSSET) ON ALL SUBFRAMES WHEN INSTALLING PINTLE HOOK.

IS4140 IS INSTALLATION INSTRUCTIONS.

INTEGRATED

INCOY INDIANA

H24
PH-400

PH-400 SPECIFICATIONS

Rigid type pindle hook with air operated plunger. Air operated plunger provides a minimum clearance and some shock absorption at the coupling.

18,000 lbs. Maximum Vertical Load 90,000 lbs. Maximum Gross Trailer Weight (120,000 lbs. Tensile)

SAE J847 Information:
Type I - not applicable. Type II - 90,000 lbs.

**IMPORTANT SAFETY INFORMATION:**

Maintain adequate vertical (tongue) load to properly control the trailer (generally 10%) but do not exceed the above rated capacities.

**DO NOT** damage the latch. Be particularly careful with the drawbar when coupling and uncoupling.

Other steps and inspections are also required. Consult OSHA and D.O.T. regulations and American Trucking Association for complete coupling and uncoupling procedures. These cover items such as cargo securement, brakes, lights, safety chains, and other important requirements.

This equipment must not be used or maintained in a careless manner.

**GENERAL INFORMATION:**

1. Do not modify or add to the product.
2. Wear safety goggles during installation, removal and servicing.
3. Never strike any part of the item with a steel hammer.
4. Do not weld on this product.

This product is covered by Holland's Commercial Products Warranty. Holland reserves the right, without giving prior notice, to change specifications and dimensions as designs are altered or improved.

**TOWING APPLICATIONS:**

Trailer, full trailers, doubles, and triples operations within the stated capacities. For off-road applications, reduce the above capacities by 25% and use in conjunction with a swivel type drawbar.

**DRAWBAR EYE DIMENSIONS:**

2.44” to 3” I.D. with 1.25” to 1.63” diameter section.

**MOUNTING:**

1. Use a mounting structure of sufficient strength to support the rated capacity of the pindle hook in accordance with SAE J849 and SAE J847, respectively.

2. Use the hole pattern described on the reverse.
3. Use (8) .75” grade 8 fasteners, properly tightened. The recommended minimum torque is 200 ft-lbs., per SAE J429.
4. A Holland XB-16594S air cylinder is recommended for use with Holland pindle hooks.
5. Adjustment of Holland's air activated plunger: The Holland XB-16594S air cylinder is preset for mounting structure thickness up to 1.0” with a 1.62” diameter drawbar section. If your mounting structure is different, adjust the plunger as follows:
   A. Loosen cylinder rod jam nut (A) as shown in  
   B. Turn the plunger rod (B) out (counterclockwise) a distance equal to the difference between your mounting structure thickness and 1.0.
   C. Retighten cylinder rod jam nut (A) securely.
6. Mount the air cylinder and plunger assembly, making sure that the air cylinder and plunger assembly are in line with the pindle body. Adjust as required and tighten the air cylinder bolts securely.
7. Connect the air supply and check for proper operation.
8. Check the plunger adjustment. When properly adjusted, the plunger should tightly grip a 1.25” round bar (or plunger adjustment tool TF-0314?) when energized (see FIGURE 1) and retract far enough when de-energized to allow easy removal of the drawbar.

**FIGURE 1**

**FIGURE 2**
**OPERATING INSTRUCTIONS:**

1. Deactivate the plunger by removing air pressure. Check to see that the plunger (XA-04156) is retracted.
2. Before using the pintle hook, inspect for proper operation; worn, damaged, or missing parts; and a secure mounting. Correct as required for use.
3. Open the latch (XA-02536) by pushing the handle (XA-01534-1) to the left and rotating it down. While keeping the handle rotated down, lift the latch open.
4. Position the drawbar eye over the horn of the pintle and lower it into place.
5. Push the latch closed. Verify that the primary and secondary locks engage. See FIGURE 2.
6. Extend plunger by applying air pressure.

**MAINTENANCE:**

For proper performance, the following maintenance steps should be performed every 30,000 miles or 3 months, whichever comes first:

1. Clean and check for proper operation. Inspect for worn, damaged or missing parts. Replace as required using only Holland parts.
2. Inspect, in particular, the coupling contact area. Replace when wear exceeds 1/8" (0.125") from the original surface profile.
3. Lubricate latch pivots with a light oil lubricant.
4. Check mounting fasteners for proper torque.
5. Check plunger adjustment. See item 8 of "Mounting Instructions", described previously.

---

**ALL DIMENSIONS SHOWN ARE NOMINAL**
HYDRAULIC CIRCUIT SCHEMATIC FOR ROLL-OFF TRUCK HOIST
SEE APPLICATION CHART.

REMOKES: R1- ADDED CYLINDER CHARTS
R2- A2084 WAS A1245
R3- 3/2/00 GB REMOVED SINGLE AXLE AND UPDATED PART NO'S
R4- 5/25/01 GB A3231 WAS A3211
R5- 9/21/01 GB ADDED U75-DR/ID-194
R6- 8/1/02 GB DIRECT MOUNT PUMP WAS A1001
R7- 8/16/04 GB FLIPPED A3211 & A3231
HYDRAULIC CIRCUIT SCHEMATIC FOR ROLL-OFF TRUCK HOIST
SEE APPLICATION CHART.

REMARKS:
R1-  ADDED CYLINDER CHARTS
R2-  3/2/00 GB REMOVED SINGLE AXLE HOISTS
R3-  8/1/02- GB- DIRECT MOUNT PUMP WAS A1001
HYDRAULIC CIRCUIT SCHEMATIC FOR ROLL-OFF TRUCK HOIST
SEE APPLICATION CHART.

REMARKS:
R1 - ADDED CYLINDER CHARTS
R2 - A2084 WAS A1245 AND 4870 WAS 4869
R3 - 03/02/00 - JJD - UPDATED PART NUMBERS
R4 - 8/1/01 - GB - DIRECT MOUNT WAS A1001
HYDRAULIC CIRCUIT SCHEMATIC FOR ROLL-OFF TRUCK HOIST
SEE APPLICATION CHART.

REMARKS:
R1- ADDED CYLINDER CHARTS
R2- A2084 WAS A1245 ADDED 4869
R3- 3/2/00 GB UPDATED PART NO'S
R4- 5/25/01 GB A3231 WAS A3211
R5- 8/1/02 GB DIRECT MOUNT WAS A1001
R6- 8/16/04 GB FLIPPED A3211 & A3231
HYDRAULIC CIRCUIT SCHEMATIC FOR ROLL-OFF TRUCK HOIST
SEE APPLICATION CHART.

REMARKS:
R1- ADDED CYLINDER CHARTS
R2- 03/02/00 - JJD - UPDATED PART NUMBERS
R3- 05/25/01 - GAB - A3231 WAS A3211
R4- 8/1/02- GB- DIRECT MOUNT WAS A1001
HYDRAULIC CIRCUIT SCHEMATIC FOR ROLL-OFF TRUCK HOIST
SEE APPLICATION CHART.

### Table: LIFT CYLINDER WINCH CYLINDER

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<tr>
<th>LIFT HOISTS</th>
<th>LIFT CYLINDER</th>
<th>WINCH CYLINDER</th>
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<td>U4-HH-156</td>
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<td>U4-HH-174</td>
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<td>U4-DL-174</td>
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<td>A3137</td>
<td>A3147</td>
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### Remarks:
- R1- Added Cylinder Charts
- R2- A2084 was A1245
- R3- 3/2/90 GB updated part ND's
- R4- 8/2/02-GB direct mount was A1001

P.6
HYDRAULIC CIRCUIT SCHEMATIC FOR ROLL-OFF TRUCK HOIST
SEE APPLICATION CHART.
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TOTAL WT. = 335.00 lbs
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**TOTAL WT. = 182.00 lbs**

**OPTIONAL DRIVE LINE PUMP**

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<tr>
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<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>QTY</th>
<th>WT</th>
</tr>
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<tbody>
<tr>
<td>28</td>
<td>BLK P HEX BUSH, 1 1/4MP - 1FP</td>
<td>1463</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>PUMP, 35GPM</td>
<td>8683</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>31</td>
<td>BLK P, 90L, 1 1/4 MP - 1 1/2 FP</td>
<td>A2314</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>STANDARD U-JOINT</td>
<td>1071</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>43</td>
<td>1/4' X 1' WOODRUFF-KEY</td>
<td>1492</td>
<td>2</td>
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</tr>
<tr>
<td>44</td>
<td>SLIP U-JOINT</td>
<td>1072</td>
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<tr>
<td>45</td>
<td>PTO SHAFT X 36'</td>
<td>953</td>
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<td>46</td>
<td>PUMP MOUNTING PLATE</td>
<td>A774</td>
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<tr>
<td>47</td>
<td>BOLT, 1/2-13X1 G5</td>
<td>50B1355-100</td>
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<tr>
<td>48</td>
<td>PUMP MOUNTING BRACKET</td>
<td>2259W</td>
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**OPTIONAL ITEMS**

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<tr>
<td>1</td>
<td>OIL TANK (W/DUT VALVE BRKT)</td>
<td>7087BO</td>
<td>1</td>
<td>183</td>
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<tr>
<td>2</td>
<td>2P SCH160 B4</td>
<td>200BP160-84</td>
<td>2</td>
<td>105</td>
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<tr>
<td>3</td>
<td>MTG BRACKET (STREET SIDE)</td>
<td>1935BO</td>
<td>1</td>
<td>57</td>
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<tr>
<td>4</td>
<td>MTG BRACKET (CURB SIDE)</td>
<td>1936BO</td>
<td>1</td>
<td>84</td>
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<tr>
<td>5</td>
<td>MTG BRACKET</td>
<td>1937BO</td>
<td>1</td>
<td>96</td>
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CHANGE DESCRIPTION

EON DATE

NO.

BY

GALBREATH INCORPORATED
WINamac, INdIANA

SCALE 1" = 1"

OIL RESERVOIR, 50 GALLON HOISTS (7065BO)

DO NOT SCALE DRAWING

HOISTS H1

BOOK NO.

18

NO.

IS7002-2

P:12
DIRECT MOUNT PUMP, P/N A1001

35 GPM @ 1500 RPM

SEAL KIT - P/N 9783

INCORPORATED
WINAMAC, INDIANA

HOISTS H1

SCALE 1/3" = 1"

DATE 01/05/00

DRAWN DATE

NO.

18

IS4405

NO.

BY

HMK

REF.

DO NOT SCALE DRAWING

BOOK NO.

Galbreath, Inc. 2000

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DIRECT MOUNT PUMP, P/N A3789

35 GPM @ 1500 RPM
HOISTS H1
DIRECT MOUNT PUMP, P/N A1643
35 GPM @ 1500 RPM
TYPICAL DIRECT MOUNT PUMP MOUNTING BRACKET
for
MACK TRANSMISSIONS T2060 & T2090

USE IS4409 ON PUMPS WITH 1 PUMP END COVER NUT
USE IS5535 ON PUMPS WITH 2 PUMP END COVER NUTS

BOLT TO THE TRANSMISSION

GALBREATH
PART NUMBER
4035BO

BOLT TO THE PUMP

Ø9/16" TYPICAL

Ø11/16" TYPICAL

3 1/2"

3 9/16"

2 3/4"

3 9/16"
TYPICAL DIRECT MOUNT PUMP MOUNTING BRACKET
for
MACK TRANSMISSIONS T2060 & T2090

USE IS4409 ON PUMPS WITH 1 PUMP END COVER NUT
USE IS5535 ON PUMPS WITH 2 PUMP END COVER NUTS
TYPICAL DIRECT MOUNT PUMP MOUNTING BRACKET
for
FULLER TRANSMISSION RXT 14710C
TYPICAL DIRECT MOUNT PUMP MOUNTING BRACKET
for
FULLER TRANSMISSION RXT 14710C

USE IS4411 ON PUMPS WITH 1 PUMP END COVER NUT
USE IS5536 ON PUMPS WITH 2 PUMP END COVER NUTS

GALBREATH
PART NUMBER
5714BO

BOLT TO THE TRANSMISSION

BOLT TO THE PUMP

Ø7/16" (TYP)

Ø11/16" (TYP)

11/16'

3 1/8"

2 3/4'

3 9/16"
TYPICAL DIRECT MOUNT PUMP MOUNTING BRACKET
for
ALLISON TRANSMISSION HT740RS

USE IS4410 ON PUMPS WITH 1 PUMP END COVER NUT
USE IS5537 ON PUMPS WITH 2 PUMP END COVER NUTS

BOLT TO THE TRANSMISSION

BOLT TO THE PUMP

GALBREATH PART NUMBER
4032BO

P:28
TYPICAL DIRECT MOUNT PUMP MOUNTING BRACKET
for
ALLISON TRANSMISSION HT740RS

USE IS4410 ON PUMPS WITH 1 PUMP END COVER NUT
USE IS5537 ON PUMPS WITH 2 PUMP END COVER NUTS

BOLT TO THE TRANSMISSION

BOLT TO THE PUMP

GALBREATH PART NUMBER
5715BO

HOISTS H
PUMP/TRANSMISSION BRACKET

INcorporated
WINAMAC, INDIANA

ALLISON HT740RS TRANSMISSION

SCALE 1/4" = 1"

DO NOT SCALE DRAWING

05/23/02

ALLISON TRANSMISSION HT740RS
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<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>QTY</th>
<th>WT</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>6X2X1/4 HC 32</td>
<td>25RTC62-32</td>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td>2</td>
<td>MOUNTING BRACKET</td>
<td>3377W</td>
<td>2</td>
<td>14</td>
</tr>
</tbody>
</table>

TOTAL WT. = 46#
R3-UPDATED TO NEW PART NO. SYS.
R2-DRAWN ON CAD NO CHANGE

For DRIVE LINE TYPE PUMP

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REF. 4228AD 0160BD AH273

DO NOT SCALE DRAWING

SCALE 1/2"=1" PUMP MOUNTING BRACKET

HOISTS

BY TOMINE

DATE 8/18/80

SAE B 4 BOLT FLANGE

INTEGRATED

WINAMAC, INDIANA

GALBREATH

BOOK NO. 20C

NO. A774
HYDRAULIC CYLINDER A3137

6" BORE, 4 1/2" ROD, 72" STROKE

---

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<td></td>
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</tr>
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<td>PLUN. ASY, 4.50, PLATED</td>
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<td>1</td>
</tr>
<tr>
<td>3</td>
<td>GLAND</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>SPACER</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>WEAR RING,6.00X5.75X1.00, PISTON</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>PISTON SEAL,6.00X3.00, K90 T BRZ</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>WEAR RING, 4.75X4.50X1.00, GLAND</td>
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</tr>
<tr>
<td>8</td>
<td>BUFFER RING</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>LIP SEAL, 5.00X4.50X 0.56</td>
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<td>1</td>
</tr>
<tr>
<td>10</td>
<td>WIPER, CANNED</td>
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<table>
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<th>PART NO.</th>
<th>QTY</th>
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<tbody>
<tr>
<td>11</td>
<td>RET RING, INT</td>
<td></td>
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</tr>
<tr>
<td>12</td>
<td>D-RING, 6.00X5.75X ARP-255, 90 DU</td>
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<td>13</td>
<td>BU RING, 6.00X5.75, ARP-255, 90 DU</td>
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</tr>
<tr>
<td>14</td>
<td>SCREW, SET, S0C01, 25-20X.25 LG</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>FITTING, GREASE, 1/2 NPT, STR</td>
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</tr>
</tbody>
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SEAL KIT NO. A3130 INCLUDES ITEMS (5,7,8,9,10,11,12, & 13)

* MUST SPECIFY CYLINDER BORE, STROKE, AND PART NUMBER.
* MUST SPECIFY SERIAL NO. OF CYLINDER
HYDRAULIC CYLINDER

A3145 - 7" BORE, 3" ROD, 75" STROKE
A3147 - 7" BORE, 3" ROD, 80" STROKE
A3149 - 7" BORE, 3" ROD, 90" STROKE
A3143 - 7" BORE, 3" ROD, 108" STROKE

SEAL KIT NO. A3148 INCLUDES ITEMS (8,9,10,11,12,13,14 & 15)
★ MUST SPECIFY CYLINDER BORE, STROKE, AND PART NUMBER.
MUST SPECIFY SERIAL NO. OF CYLINDER

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<td>BARREL ASSEMBLY</td>
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</tr>
<tr>
<td>3</td>
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<tr>
<td>4</td>
<td>SPACER</td>
<td></td>
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</tr>
<tr>
<td>5</td>
<td>PISTON</td>
<td></td>
<td>1</td>
</tr>
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<td>6</td>
<td>LOCK NUT</td>
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<tr>
<td>7</td>
<td>SET SCREW</td>
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<tr>
<td>8</td>
<td>O RING</td>
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<td>9</td>
<td>WEAR RING</td>
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</tr>
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<td>10</td>
<td>PISTON SEAL</td>
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<td>ROD SEAL</td>
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<tr>
<td>13</td>
<td>WEAR RING</td>
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</tr>
<tr>
<td>14</td>
<td>ROD WIPER</td>
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<td>15</td>
<td>BACKUP RING</td>
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</tr>
<tr>
<td>16</td>
<td>PLUG</td>
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<td>3</td>
</tr>
<tr>
<td>17</td>
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CHANGE DESCRIPTION

DO NOT SCALE DRAWING

SCALE 1" = 1"

BY HMK

DATE 5/31/00

HOISTS H1
HYDRAULIC CYLINDER
HOISTS

BOOK NO. 18

IS4549
HYDRAULIC CYLINDER A3383
6-5-4 X 118" STROKE

NO. DESCRIPTION PART NO. QTY
1 BARRREL ASSEMBLY 7.03 dia 1 1
2 SLEEVE ASSEMBLY 6.30 dia 1 1
3 SLEEVE ASSEMBLY 3.50 dia 1 1
4 PLUNGER ASSEMBLY 4.20 dia 1 1
5 GLAND RET 6.94-12 THRD WIPER 1 1
6 GLAND RET 5.94-12 THRD WIPER 1 1
7 GLAND RET 4.94-12 THRD WIPER 1 1
8 SCREW, SET 232-24 x .31 lg 3 3
9 SLUG, NYLON, 1/4x1/8 1 1
10 VALVE, RELIEF 1 1
11 PISTON RING 2 2
12 PISTON RING 2 2
13 PISTON RING 2 2
14 WEAR RING 2 2
15 WEAR RING 2 2
16 WEAR RING 2 2
17 VALVE, GASKET, BLEEDER 2 2

NO. DESCRIPTION PART NO. QTY
18 VALVE, GASKET, BLEEDER 2 2
19 RETAINER RING, INT 1 1
20 RETAINER RING, INT 1 1
21 RETAINER RING, INT 1 1
22 KIT, BLD.PACK, WIPER 1 1
23 GUIDE RING, TOP, NYLON 1 1
24 GUIDE RING, TOP, NYLON 1 1
25 GUIDE RING, TOP, NYLON 1 1
26 PLUG,SAE No.1501 1/16-12HEX HS 1 1
27 PLUG,SAE No.1501 1/16-12HEX HS 1 1
28 FITTING, GREASE, 1/8 NPT STR 2 2
29 SETSCREW, 1/4-20 1 1

SEAL KIT NO. A3384 INCLUDES ITEMS (11,12,13,14,15,16,22,23,24 & 25)
* MUST SPECIFY CYLINDER BORE, STROKE, AND PART NUMBER.
* MUST SPECIFY SERIAL NO. OF CYLINDER.

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<th>BY</th>
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DO NOT SCALE DRAWING
HOISTS H1
HYDRAULIC CYLINDER A3383
HOISTS

INTEGRATED INCORPORATED
WINAMAC, INDIANA

GEORGE
8/3/01

BOOK NO.
18
HOISTS

IS5098
HYDRAULIC CYLINDER A3377
6-5 X 114" STROKE

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<td>SLEEVE ASSEMBLY, 6.00 dia</td>
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<tr>
<td>3</td>
<td>PLUNGER ASSEMBLY, 5.00 dia</td>
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<td>4</td>
<td>GLAND, RET., 6.94-12 THIRD, WIPER</td>
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<tr>
<td>5</td>
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<tr>
<td>6</td>
<td>SCREW, SET, 3/16-24 x .31 lg</td>
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<tr>
<td>7</td>
<td>SLUG, NYLON, 1/4 x 1/8</td>
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<td>8</td>
<td>VALVE, RELIEF</td>
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<td>9</td>
<td>PISTON RING</td>
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<td>13</td>
<td>VALVE, GASKET, BLEEDER</td>
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<td>VALVE, SCREW, BLEEDER</td>
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<td>KIT, BLD,PACK, WIPER</td>
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<td>18</td>
<td>GUIDE RING, TOP, NYLON</td>
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<td>19</td>
<td>GUIDE RING, TOP, NYLON</td>
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<td>PLUG, SAE No.120106-12HEX HD</td>
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<tr>
<td>21</td>
<td>FITTING, GREASE, 1/8 NPT STR</td>
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<td>22</td>
<td>PLUG, SAE No.161130-12HEX HD</td>
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<td>KIT, LABEL</td>
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</table>

SEAL KIT NO. A3168 INCLUDES ITEMS (9,10,11,12,17,18 & 19)
* MUST SPECIFY CYLINDER BORE, STROKE, AND PART NUMBER.
* MUST SPECIFY SERIAL NO. OF CYLINDER

---

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PAGE 1 OF 1

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CHANGE DESCRIPTION

ECN DATE  NO.  BY

---

GALBREATH
INCORPORATED
WINamac, INdIANA

DO NOT SCALE DRAWING

SCALE 1" = 1"

HOISTS H1
HYDRAULIC CYLINDER A3377
18
HOISTS

BY GEORGE
DATE 8/3/01

BOOK NO.
IS5099

---
# HYDRAULIC CYLINDER

**A3089** - 3 1/2x2 1/2 x 60" STROKE  
**A3091** - 3 1/2x2 1/2 x 80" STROKE

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<td>GLAND</td>
<td>□</td>
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</tr>
<tr>
<td>3</td>
<td>ROD</td>
<td>□</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>PISTON</td>
<td>□</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>LOCKNUT</td>
<td>□</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>WIPER RING</td>
<td>□</td>
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</tr>
<tr>
<td>7</td>
<td>PISTON SEAL</td>
<td>□</td>
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</tr>
<tr>
<td>8</td>
<td>ROD O RING</td>
<td>□</td>
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<td>WEAR RING</td>
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<td>10</td>
<td>U-CUP, ROD SEAL</td>
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<tr>
<td>12</td>
<td>O RING</td>
<td>□</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>LOCK WIRE</td>
<td>□</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>WIPER RING</td>
<td>□</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>NAME PLATE</td>
<td>□</td>
<td>1</td>
</tr>
</tbody>
</table>

Seal Kit No. 3092 includes items (6, 7, 8, 9, 10, 11, 12, 13 & 14)  
*Must specify cylinder bore, stroke, and part number.  
Must specify serial no. of cylinder.*
<table>
<thead>
<tr>
<th>NO.</th>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>QTY</th>
<th>WT</th>
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<tbody>
<tr>
<td>1</td>
<td>TRACK WELDMENT</td>
<td>302EV</td>
<td>1</td>
<td>70</td>
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<tr>
<td>2</td>
<td>COVER WELDMENT</td>
<td>305SV</td>
<td>1</td>
<td>93</td>
</tr>
<tr>
<td>3</td>
<td>PIN</td>
<td>G499</td>
<td>1</td>
<td>1.2</td>
</tr>
</tbody>
</table>

TOTAL WT. = 155.20 lbs
**Diagram Description:**

- **Handle Assembly:** P/N 340540, Qty: 1, WT: 15 lbs.
- **7/16 RB Cush 32:** P/N 4482318, Qty: 6, WT: 8 lbs.
- **Cover Plate:** P/N 680, Qty: 1, WT: 38 lbs.
- **Handle:** P/N 8799, Qty: 3, WT: 6 lbs.
- **Pivot Plate:** P/N 501, Qty: 3, WT: 4 lbs.
- **5/8 RB Cush 55:** P/N 6302527, Qty: 3, WT: 13 lbs.
- **Link:** P/N 502, Qty: 3, WT: 1 lb.
- **Locknut, 5/16-18 G5:** P/N 3184803, Qty: 4, WT: 2673 lbs.
- **Cot Pin, 3/32X1, 1/4:** P/N 098P-125, Qty: 9, WT: 3 lbs.
- **Bolt, 5/16-18X1, 1/2 G5:** P/N 3184802-150, Qty: 4, WT: 115 lbs.
- **Washer, 5/16 G5 USS:** P/N 3186352, Qty: 4, WT: 1.5 lbs.
- **Cap Blue Control Handle:** P/N 4364, Qty: 2.
- **Cap Red Control Handle:** P/N 4365, Qty: 2.
- **Cap Yellow Control Handle:** P/N 4366, Qty: 2.
- **End Cap:** P/N 5614, Qty: 2, WT: 1 lb.
- **Bolt, 5/16-24X1, 1/2 G5:** P/N 3184250-150, Qty: 3, WT: 3 lbs.
- **Nut, 5/16-24 G5:** P/N 3184240-3, Qty: 3, WT: 3 lbs.

**Dimensions:**

- **Bend, drill, & weld at assembly.**
- **Blue cap, lift red cap, winch yellow cap tail.**

**Total Wt.: 95.00 lbs**

**Notes:**

- Items 1-18 used to connect yokes to valve.

---

**Additional Information:**

- **Company:** Galbreath Industries
- **Location:** Wadac, Indiana
- **Date:** 6/29/99
- **Scale:** 1/56 = 1'
- **Ref:** 4208AC
- **Bldg:** 10

---

**Print:**

- **Boeing:**
- **Date:**
- **Signature:**
- **Name:**
- **Title:**
- **Note:**

---

**Note:**

- **Do not scale drawing**
- **Inside controls**
- **Hoist conventional cab**
- **3-spool valve**
- **ISO 9000**
GALBREATH RECOMMENDS THE REPLACEMENT OF THE VALVE BRACKET IF THE CUSTOMER HAS A COMMERCIAL VALVE.

NOTE: MEASURE, TRIM, AND BEND AT ASSEMBLY AND DRILL HOLES FOR COTTER PINS

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<thead>
<tr>
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<th>QTY</th>
<th>WT</th>
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</thead>
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<td>44RD16-60</td>
<td>2</td>
<td>5.10</td>
</tr>
<tr>
<td>2</td>
<td>VALVE HANDLE BRACKET</td>
<td>AF977</td>
<td>2</td>
<td>.30</td>
</tr>
<tr>
<td>3</td>
<td>COT PIN, 3/32X1 1/4</td>
<td>09KP-125</td>
<td>4</td>
<td></td>
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<tr>
<td>#4</td>
<td>(OPTIONAL) VALVE BRACKET</td>
<td>AE302</td>
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OPTIONAL FOR 3-SPOOD VALVE

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<th>QTY</th>
<th>WT</th>
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<tbody>
<tr>
<td>1</td>
<td>7/16 RD C1018 60</td>
<td>44RD16-60</td>
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<td>7.65</td>
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<td>VALVE HANDLE BRACKET</td>
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<td>3</td>
<td>.45</td>
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<td>COT PIN, 3/32X1 1/4</td>
<td>09KP-125</td>
<td>6</td>
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</tr>
</tbody>
</table>

REF 4208AD & 5195AD

NOTE: WELD BRACKET AND CUT OFF EXCESS HANDLE

OPTIONAL BRACKET FOR OLD VALVE RETROFIT

OIL RESERVOIR

Galbreath, Inc. 2002

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Ref. 4208AD 5195AD

Do not scale drawing

Scale 1/10" = 1'

Hoists H Rod Controls Linkage

Hoist (5771BD)

Incorporated Winamac, Indiana

Date 07/31/02

Ecn Date No. By

Book No. 18

No. IS5585
NOTE: WHEN ORDERING CONTROL CABLES, PLEASE SPECIFY DESIRED LENGTH FROM THE LIST. IF LENGTH IS NOT SPECIFIED, A 252" (PART NO. 3356) WILL BE SHIPPED. PART NO. 3355, 3356 AND 3011 ARE STOCK ITEMS. ALL OTHER LENGTHS ARE CONSIDERED SPECIAL ORDER.

NOTE: CABLE LENGTH CANNOT BE ALTERED IN THE FIELD. MEASURE CABLE FROM ROD END TO ROD END AS SHOWN.

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>CABLE LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>CONTROL HANDLE (CABLE)</td>
<td>1510</td>
<td>--</td>
</tr>
<tr>
<td>2.</td>
<td>CONTROL CABLE</td>
<td>1097</td>
<td>192&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2982</td>
<td>204&quot;</td>
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<td></td>
<td></td>
<td>3354</td>
<td>228&quot;</td>
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<tr>
<td></td>
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<td>3355</td>
<td>240&quot;</td>
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<td></td>
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<td>3356</td>
<td>252&quot;</td>
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<tr>
<td></td>
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<td>3011</td>
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<tr>
<td></td>
<td></td>
<td>2979</td>
<td>120&quot;</td>
</tr>
<tr>
<td>ITEM NO.</td>
<td>DESCRIPTION</td>
<td>PART NO.</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>HANDLE MT'G BRK'T (CONSOLE MOUNT)</td>
<td>C396AD</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>HANDLE MT'G BRK'T (FLOOR MOUNT)</td>
<td>A470</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>CABLE ANCHOR BRK'T (OIL TANK MOUNT)</td>
<td>C393</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>CABLE ANCHOR BRK'T (OIL TANK MOUNT)</td>
<td>C394</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CABLE ANCHOR BRK'T (OIL TANK MOUNT)</td>
<td>C392</td>
<td></td>
</tr>
</tbody>
</table>

ITEM NO. 1 IS USED FOR MOUNTING CONTROL HANDLES INSIDE TILT CABS EQUIPPED WITH CONSOLE.
ITEM NO. 2 IS USED FOR MOUNTING CONTROL HANDLES INSIDE TILT CABS WITH FULL SEAT OR WITHOUT CONSOLE.
ITEM NO'S 3-4-5 ARE TO BE MOUNTED IN FRONT OF VALVE ON SIDE MOUNT OIL TANKS TO ANCHOR CONTROL CABLE ENDS.

R2 CORRECTED BILL OF MATERIAL
R1 REDRAWN ON CAD, ITEMS 3-4-5 WAS 4860AD

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WASTEQUIP RECOMMENDS THE REPLACEMENT OF THE VALVE BRACKET IF THE CUSTOMER HAS A COMMERCIAL VALVE.

AS REQUIRED PER CABLES TO OPERATE W/ADJUSTMENT AVAILABLE

OPTIONAL BRACKET FOR OLD VALVE RETROFIT

REF. 4736BD

DO NOT SCALE DRAWING

SCALE 1/15" = 1"
<table>
<thead>
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<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>QTY</th>
<th>WT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BRACKET, CABLE ANCHOR</td>
<td>C392</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>CABLE ANCHOR BRACKET</td>
<td>AE448</td>
<td>1</td>
<td>2.48</td>
</tr>
<tr>
<td>3</td>
<td>VALVE ADAPTOR, CABLE CONTROL</td>
<td>SEE CHART</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>CONNECTOR</td>
<td>SEE CHART</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>(OPTIONAL) VALVE BRACKET</td>
<td>AE449</td>
<td>1</td>
<td>25</td>
</tr>
</tbody>
</table>

**2 SPOOL**

| 3   | VALVE ADAPTOR, CABLE CONTROL      | A3234    | 2   |    |
| 4   | CONNECTING LINK                   | AE452    | 2   | .44 |

**3 SPOOL**

| 3   | VALVE ADAPTOR, CABLE CONTROL      | A3234    | 3   |    |
| 4   | CONNECTING LINK                   | AE452    | 3   | .66 |
MOUNTING INSTRUCTIONS

1. Locate the lower anchors (item 6) using the 2 "hold" dimensions given. (Weld solid in place)

2. Locate the upper anchor (item 4) using the 2 "hold" dimensions shown. (Tack weld the upper anchor)

3. Add the bumper weldment (item 1) use item 2 and pin bumper to lower anchors.

4. Add the 26 1/2" angled link (item 3) (do not add the collars yet)

5. Cycle the hoist to check that the bumper clears the hoist and the ground.

6. If the bumper hits either the hoist or the ground, move the upper anchor forward/backward to make it clear. When moving the upper anchor, keep the same hold height and only move horizontally. Moving the upper anchor towards the rear makes the bumper go down faster than the hoist (moving it away from the hoist tubes) while moving the upper anchor towards the hinge puts the bumper closer to the hoist tubes when the hoist is up.

NOTE: Moving the upper anchor 1/2" will make the bumper move approximately 3" either closer or further away from the hoist tubes.

IMPORTANT

The truck frame height shown is 48" from the ground to the top of the truck frame. If the truck frame height is less than 40 1/2", the bumper will need to be 2" shorter so that it will not hit the ground if the hoist is rotated the entire 48°.

---

[Diagram of mounting instructions with dimensions and components listed below]

---

<table>
<thead>
<tr>
<th>NO.</th>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>QTY</th>
<th>WT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>37824V</td>
<td>1</td>
<td>106</td>
</tr>
<tr>
<td>2</td>
<td>BOLT, 3/4-10X3 G5</td>
<td>7531025-300</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>LINK</td>
<td>38677V</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>ANCHOR, UPPER</td>
<td>37824U</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>LOCKNUT, 3/4-10 G5</td>
<td>751A055</td>
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</tr>
<tr>
<td>6</td>
<td>ANCHOR, LOWER</td>
<td>J445</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>COLLAR</td>
<td>J449</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>BOLT, 3/8-16X2 G5</td>
<td>3816025-200</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>LOCKNUT, 3/8-16 G5</td>
<td>3816055</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>GREASE, FIG, 1/4-28 STR</td>
<td>042229-5</td>
<td>4</td>
<td>-</td>
</tr>
</tbody>
</table>

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Galbreath, Inc. 1999

Designed by one or more of the following US patents:

R3 CHANGES DIMENSIONS 7/7/99 R3 GB INCORPORATED WADAMAC, INDIANA

DO NOT SCALE DRAWING

1/15" = 1'

AUTOMATIC FOLD UP BUMPER FOR 10, 16, & 1X MODEL HOIST

REV: 7173AD

ENW

ISC1135
MOUNTING INSTRUCTIONS

1. Locate the lower anchors (item 6) using the "HOLD" dimensions shown. (Weld in place)
2. Locate the upper anchor (item 4) using the "HOLD" dimensions shown. (Tack weld the upper anchor)
3. Add the bumper weldment (item 1) and pin bumper to lower anchors.
4. Add the 20 1/2" angled link (item 5) (do not add the collars yet)
5. Cycle the hoist to check that the bumper clears the hoist and the ground.
6. If the bumper hits either the hoist or the ground, move the upper anchor forward/backward to make it clear. When moving the upper anchor, keep the same hold height and only move horizontally.

NOTE: Moving the upper anchor 1/2" will make the bumper move approximately 3" either closer or further away from the hoist tubes.

IMPORTANT:

The truck frame height shown is 40" from the ground to the top of the truck frame. If the truck frame height is less than 40 1/2", the bumper will need to be 3" shorter so that it will not hit the ground if the hoist is rotated the entire 40°.

If the fold up bumper comes close to the truck bumper, the truck bumper may need to be trimmed back if there is interference.

SEE IS4175 FOR THE SAME BUMPER USED WITH A PINTLE HOOK.

NOTES:

1. R5079V
2. BOLT, 3/8-16 x 3/4 GS
3. LOCKNUT, 3/8-16 GS
4. ANCHOR, UPPER
5. LOCKNUT, 3/8-16 GS
6. ANCHOR, LOWER
7. COLLAR
8. COLLAR
9. BOLT, 3/8-16 x 2 GS
10. GREASE FIT, 1/4-28 STR

<table>
<thead>
<tr>
<th>NO.</th>
<th>DESCRIPTION</th>
<th>PART NO.</th>
<th>QTY</th>
<th>WT</th>
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<tbody>
<tr>
<td>1</td>
<td>BUMPER VELDMENT</td>
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<td>106</td>
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<td>2</td>
<td>BOLT, 3/8-16 x 3/4 GS</td>
<td>7590825-200</td>
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<td>3</td>
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<td>7</td>
<td>COLLAR</td>
<td>J449</td>
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<td>1</td>
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<td>8</td>
<td>BOLT, 3/8-16 x 2 GS</td>
<td>3839425-200</td>
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</tbody>
</table>
MOUNTING INSTRUCTIONS

1. LOCATE THE LOWER ANCHORS (ITEM 6) USING THE 6 'HOLD' DIMENSIONS GIVEN.
   (FILLED IN PLACE)

2. LOCATE THE UPPER ANCHOR (ITEM 4)
   USING THE 6 'HOLD' DIMENSIONS GIVEN.
   (STACK WELD THE UPPER ANCHOR)

3. ADD THE BUMPER WELDMENT (ITEM 1)
   USE ITEM 2 AND PIN BUMPER TO LOWER ANCHORS.

4. ADD THE 20 1/2" ANGLED LINE (ITEM 2)
   (DO NOT ADD THE COLLARS YET)

5. CYCLE THE HOIST TO CHECK THAT THE BUMPER REPLACES THE HOIST AND THE GROUND.

6. IF THE BUMPER HITS EITHER THE HOIST OR THE GROUND, MOVE THE UPPER ANCHOR FORWARD/BACKWARD TO MAKE CLEAR WHEN MOVING THE UPPER ANCHOR KEEP THE SAME HOLD HEIGHT AND ONLY MOVE HORIZONTALLY.

MOVING THE UPPER ANCHOR TOWARDS THE REAR MAKES THE BUMPER GO DOWN FASTER THAN THE HOIST (MOVING IT AWAY FROM THE HOIST TUBES) WHILE MOVING THE UPPER ANCHOR TOWARDS THE FRONT PUTS THE BUMPER CLOSER TO THE HOIST TUBES WHEN THE HOIST IS UP.

NOTE:

MOVING THE UPPER ANCHOR 1/4" WILL MAKE
THE BUMPER MOVE APPROXIMATELY 3" EITHER CLOSER OR FURTHER AWAY FROM THE HOIST TUBES.

IMPORTANT

THE TRUCK FRAME HEIGHT SHOWN IS 48" FROM THE GROUND TO THE TOP OF THE TRUCK FRAME. IF THE TRUCK FRAME HEIGHT IS LESS THAN 40 1/2", THE BUMPER WILL NEED TO BE 2" SHORTER SO THAT IT WILL NOT HIT THE GROUND IF THE HOIST IS ROTATED THE ENTIRE 48".

<table>
<thead>
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<th>QTY</th>
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<td>7</td>
<td>COLLAR</td>
<td>4445</td>
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<td>-</td>
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</tbody>
</table>
NOTE: DO NOT THIS BUMPER WHEN HOIST HAS SKID PLATES

NOTE: IF TRUCK FRAME HEIGHT IS GREATER THAN 44" ADJUST BUMPER DOWN TO MAINTAIN 30" MAX HEIGHT.

NOTE: TO ASSURE THAT THE BRACKETS ON THE HOIST MAIN FRAME HAVE ADEQUATE CLEARANCE, FOLD THE BUMPER UP IN THE RAISED POSITION. IF THE UNIT WORKS PROPERLY, WELD THE BRACKETS ON THE HOIST MAIN FRAME SOLID.

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R4 ITEM 2 WAS F737, 6 WAS F738
R3 ADDED BILL OF MATERIAL
R2 REDRAWN ON CAD
EDN DATE 7/23/87

INTEGRATED
WINamac, INDIANA

DO NOT SCALE DRAWING
SCALE 1/15" = 1"
<table>
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</tr>
<tr>
<td>3</td>
<td>BRACE</td>
<td>1717W</td>
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<td>52</td>
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<tr>
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</table>
TOTAL WT. = 550.00 lbs

FILLER STRIPS SIZED AND WELDED AT ASSEMBLY

WASHERS USED ONLY ON FRONT AND REAR BRACKETS

REF. 15835
NOTE:
FENDERS SHOULD HAVE AMPLE TIRE CLEARANCE AND ARE USUALLY MOUNTED TO GIVE 5 INCHES TIRE CLEARANCE.

ADJUST TO EACH JOB
16 11/16" 150 5/16"

DRILL ON JOB AND MOUNT WITH (4) 5/16"X1 BOLTS

REAR VIEW

BUMPER

WELD WHEN MOUNTING

CYLINDER MOUNTING PLATE
TRUCK FRAME

NOTE:
HOLES WILL BE DRILLED ON JOB, WHEN LARGER PLATES ARE REQUIRED, MATERIAL MUST BE OBTAINED LOCALLY

NOTE:
THese 5/16" BOLTS ARE TO BOLT FENDER CENTER TO 1717W

DIMENSION DETERMINED ON JOB

AXLE SPREAD

48' TO 54'

51' TO 55'

7" 7"

R2 - UPDATED DRAWING
R1 - REDRAWN ON CAD
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CAUTION: ALWAYS USE 3/4" OR 7/8" DIA. CABLE RESPECTIVELY AS THE HOIST WAS ORIGINALLY EQUIPPED WITH THE FOLLOWING WIRE ROPE CLASSIFICATION: EXTRA IMPROVED FLOW STEEL, 6 X 37 REGULAR RIGHT LAY WITH STEEL CORE (6 X 37 EXIWWD), SWAGED BUTTON END SHOULD BE SUFFICIENT TO WITHSTAND RATED HOIST CAPACITY.

BEFORE INSTALLING NEW CABLE, EXAMINE ALL SHEAVES. REPLACE SHEAVES WHEN NECESSARY.
INSTALL CABLE END ONTO CABLE, THREAD CABLE THROUGH SHEAVES AND GUIDES, ETC. LOOP CABLE THROUGH CABLE ANCHOR AND INSTALL CLAMPS FOLLOWING DIAGRAM BELOW. TORQUE ALL BOLTS EVENLY TO 150 FT. LB. CUT OFF EXCESS CABLE.

CABLE SIZE REQUIRED—SEE MAIN FRAME ASSEMBLY INSERT IN BACK OF MANUAL

CABLE ANCHOR

ABOVE DIMENSIONS APPROXIMATE

R2 REMOVED CABLE LENGTH CHART
R1 ADDED PART NUMBERS TO CHART

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<td>11/30/99 R1 HMK</td>
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INTEGRATED WINAMAC, INDIANA

SCALE 1/6" = 1"  CABLE REPLACEMENT PROCEDURE  HOISTS

BY GEORGE  HOISTS

DATE 3/6/89  18

NO. IS0286
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<td>4</td>
<td>KNUCKLE HOOK</td>
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</table>
1) PLACE DESIRED CABLE END ON CABLE.
2) SLIP CABLE FERRULE OVER CABLE AND CLAMP IN VICE AS SHOWN.
3) REMOVE SEIZING.
4) UNLAY WIRES.
5) SLIP WEDGES OVER THE CENTER AND DRIVE TO A SOLID SEAT.

!! WARNING !!

INSPECT ENTIRE CABLE LENGTH FOR WEAR OR DAMAGE AND REPLACE IF NECESSARY.
IF THE CABLE END REQUIRES REPLACEMENT, IT IS POSSIBLE THAT THE ENTIRE CABLE
SHOULD BE REPLACED IF ONLY CABLE END IS REPLACED. CHECK FOR SUFFICIENT
REMAINING CABLE LENGTH TO PROPERLY PICK UP CONTAINER. USE CAUTION IN UTILIZING
CABLE WEDGE WITH FERRULE AND INSPECT WITH EVERY USE.
INSTRUCTIONS

1) CLAMP CABLE IN VICE AS SHOWN.
2) REMOVE SEIZING.
3) SLIP SLEEVE OVER CABLE.
4) UNLAY WIRES.
5) SLIP PLUG OVER THE CENTER AND DRIVE TO A SOLID SEAT.
6) BEND WIRES INWARD.
7) ATTACH SOCKET TO SLEEVE AND TIGHTEN SECURELY.
8) STRAND CAN BE SEEN IN INSPECTION HOLE IF APPLIED PROPERLY.
9) SEVERAL THREADS WILL BE EXPOSED AFTER TIGHTENING.
WHEN MOUNTING DO NOT WELD ENDS

WELD BOTH SIDES FULL LENGTH

SEE IS0381 TO DETERMINE STOP LOCATION.

BURN 29 3/4" LONG SLOT IN TOP OF HOIST FRAME 1/2" FROM OUTSIDE FACE.

LEAVE 3/8" RADIUS ON CORNERS OF SLOT.

ALLOW 7 5/8" FROM FRONT OF SLOT TO DESIRED STOP LOCATION.

SET STOP ASSY INTO SLOT, CHECK STOP LOCATION AND WELD FULL LENGTH BOTH SIDES. DO NOT WELD ENDS.
WELD ALL AROUND FULL LENGTH

SEE IS0378 OR IS0380 TO DETERMINE STOP LOCATION.

BURN 2" X 18 3/4" LONG SLOT IN TOP OF HOIST FRAME ON CENTER.

LEAVE 3/8" RADIUS ON CORNERS OF SLOT.

ALLOW 4 5/8" FROM FRONT OF SLOT TO DESIRED STOP LOCATION.

SET STOP ASSY INTO SLOT, CHECK STOP LOCATION AND WELD FULL LENGTH ALL AROUND.

INTEGRATED MANUFACTURING
INCORPORATED
WINAMAC, INDIANA

REF.

DO NOT SCALE DRAWING

SCALE 1/10" = 1"

BY GEORGE

DATE 07/09/99

HOISTS H

FOLD DOWN STOP INSTALLATION OR & EX MODEL HOIST (2339W)

BOOK NO. 18

NO. IS0257
WELD BOTH SIDES FULL LENGTH

WHEN MOUNTING DO NOT WELD ENDS

SEE ISO379 TO DETERMINE STOP LOCATION.

BURN 26' LONG SLOT IN TOP OF HOIST FRAME ON CENTER.

LEAVE 3/8' RADIUS ON CORNERS OF SLOT.

ALLOW 7' FROM FRONT OF SLOT TO DESIRED STOP LOCATION.

SET STOP ASS'Y INTO SLOT, CHECK STOP LOCATION AND WELD FULL LENGTH BOTH SIDES. DO NOT WELD ENDS.

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WHEN MOUNTING DO NOT WELD ENDS

WELD BOTH SIDES FULL LENGTH

2 1/2"

3/8" R. TYP.

24"

19"

1 1/4"

1"

7"

1/2"

18 3/4"

24"

BURN 24" LONG SLOT IN TOP OF HOIST FRAME ON CENTER.

LEAVE 3/8" RADIUS ON CORNERS OF SLOT.

ALLOW 7" FROM FRONT OF SLOT TO DESIRED STOP LOCATION.

SET STOP ASS'Y INTO SLOT, CHECK STOP LOCATION AND WELD FULL LENGTH BOTH SIDES. DO NOT WELD ENDS.
OPENING DETAIL

WHEN MOUNTING DO NOT WELD ENDS

WELD BOTH SIDES FULL LENGTH

1 1/2"

3 7/8"

27 1/4"

R3/8" TYP

OUTSIDE FACE

2 1/4"

1/2"

32 3/4"

9 1/4"

27"

1 1/2"

R3/8" TYP

BURN 33" LONG SLOT IN TOP OF HOIST FRAME 1/2" FROM OUTSIDE FACE.

LEAVE 3/8" RADIUS ON CORNERS OF SLOT.

ALLOW 9 1/4" FROM FRONT OF SLOT TO DESIRED STOP LOCATION.

SET STOP ASSY INTO SLOT, CHECK STOP LOCATION AND WELD FULL LENGTH BOTH SIDES. DO NOT WELD ENDS.

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REF. | DO NOT SCALE DRAWING | HOISTS H | FOLD DOWN STOP INSTALLATION | INCORPORATED
--- | --- | --- | --- | WINAMAC, INDIANA

SCALE 1/10" = 1" | BY HMK | SI MODEL HOIST (2501W) | BOOK NO. 18

ECN DATE | NO. | BY | DATE 12/01/99 | NO. IS2700
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1- HOIST UP VISUAL WARNING LIGHT IN CAB.

1- OPTIONAL HOIST UP VISUAL WARNING LIGHT WITH AUDIBLE ALARM IN CAB.

4- HOIST UP AUDIBLE ALARM AND BACK UP AUDIBLE ALARM (A1757) LOCATED AT REAR OF HOIST. NOTE: THIS ALARM HAS TWO DISTINCT AUDIBLE SOUNDS, A BACK UP AUDIBLE PULSE AND A PULSED WARBLE SOUND FOR THE HOIST UP WARNING.
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**NOTE:** THESE ARE PART OF A3483 DECAL KIT, CABLE HOIST.
WARNING
Move ment of hoist tilt frame, cylinder and/or container can cause severe injury or death.
Do not place body or extremities between hoist/chassis and hoist attachments.
Stay clear of this area when hoist tilt frame is raising, lowering or being operated.
Always use the hoist props when servicing the hoist.

ADVERTENCIA
El movimiento del bastidor, del cilindro, y/o del envase de la inclinación del alzamiento puede causar lesión o muerte severa.
No poner el cuerpo o las extremidades entre alzamiento/chasis y no alzar los accesorios.
Permanecer claro de esta área cuando el marco de la inclinación del alzamiento está levantando, bajando, o siendo funcionado.
Utilizar siempre los apoyos del alzamiento al mantener el alzamiento.

6 DECALS REQUIRED WITH NEW STYLE OIL TANK

LOCATE ON HOIST IF THERE IS NO TOOL BOX
LOCATE ON TRUCK FRAME
LOCATE ON CYLINDER

LOCATE ON HOIST IF THERE IS NO TOOL BOX
LOCATE ON TRUCK FRAME
LOCATE ON CYLINDER

RI REMOVED TANK END VIEW

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REF.

DO NOT SCALE DRAWING
SCALE 1/50" = 1"

HOISTS H1
A4729 DECAL LOCATION
ROLL OFF HOISTS
NEW OIL TANK

INCORPORATED
WINAMAC, INDIANA

02/19/05 R1 GB
ECN DATE NO. BY

11/4/04
DATE

GEORGE

18
BOOK NO.

IS7090
NO.
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