

ROSCO

A LeeBoy Company

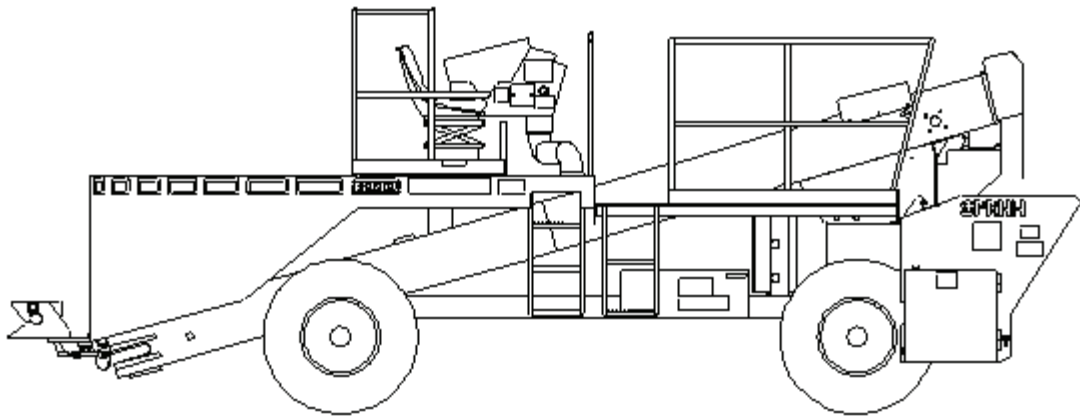
CSH-173/CSH-202 CHIPSPREADER Front Wheel Drive w/4 Wheel Drive Option

OPERATION, SERVICE, and PARTS

Manual Part No. 1003104

November 23, 2009

Revision A



NOTE: It is the responsibility of the customer or user's management to train, educate, or supervise his employees in the proper operation and maintenance of this equipment.

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INTRODUCTION

This manual has been compiled to assist the owner and/or operator with the correct operation and routine preventive maintenance procedures for the Hydraulic Chipspreader, with front wheel drive or 4-wheel drive (CSH), as manufactured by ROSCO - a VT LEEBOY COMPANY of Lincolnton, NC, U.S.A. A parts catalog is also included in this manual to allow for the accurate ordering of repair parts from Authorized Rosco Dealers/Distributors.

THIS MANUAL HAS BEEN ORGANIZED INTO SIX (6) MAJOR SECTIONS:

- | | |
|-----------------|--------------------|
| 1. INTRODUCTION | 4. MAINTENANCE |
| 2. SAFETY | 5. TROUBLESHOOTING |
| 3. OPERATION | 6. PARTS CATALOG |

A general contents page is located at the beginning of this manual as a quick reference to these sections and their major subsections. In order to receive the performance and efficiency that has been designed into the CSH Chipspreader, it is very important to:

- A. Read this manual thoroughly before operating or servicing the Chipspreader.
- B. Keep this manual in a convenient place for ready reference.
- C. Not attempt to make repairs or adjustments you do not understand. If you require additional information or service, contact your Authorized ROSCO Dealer/Distributor.

Throughout this manual references are made to the **LEFT SIDE** and **RIGHT SIDE** of the Chipspreader. These terms are used as the CSH Chipspreader is viewed from the rear of the machine.

Serial Number - It is important to know the Serial Number of this equipment. The Serial Number Plate is located on the left side of the machine below the power gate control. Record the Serial Number in the space below. Use the Serial Number in all correspondence referring to the CSH Chipspreader and when ordering parts.

Model _____

Serial Number _____

Production Year _____

Design Specifications - ROSCO - a VT LEEBOY COMPANY reserves the right to make design or specification changes without prior notification or to make any other improvements without incurring obligations to add them to any machine in existence.

Technical Information - ROSCO - a VT LEEBOY COMPANY is continuously improving its products. The technical information found in this manual was correct at the time it was approved for publication. However, if you find differences between your Chipspreader and the information contained in this manual, please contact your local Authorized ROSCO Dealer/Distributor.

INTRODUCTION

LIMITED WARRANTY POLICY & PROCEDURES

A. WARRANTY

1. If a defect in material or workmanship is found and the authorized Dealer is notified during the warranty period, ROSCO will repair or replace any part or component of the unit or part that fails to conform to the warranty during the warranty period.
2. The warranty will begin upon the completion of the warranty form by the initial customer and will expire after twelve (12) months have passed. The Warranty Card must be filled out within ten (10) days of delivery of the unit.
3. Engines and truck chassis are warranted by their manufacturers and may have warranty coverage that differs from that of ROSCO.
4. Replacement parts furnished by ROSCO are covered for the remainder of the warranty period applicable to the unit or component in which such parts are installed.
5. ROSCO has the right to repair any component or part before replacing it with a new part.
6. All new replacement parts purchased by a ROSCO dealer will carry a six (6) month warranty. Remanufactured parts purchased by a ROSCO dealer will carry a ninety (90) day warranty.

B. LIMITATIONS

ROSCO has no obligation under this warranty for:

1. Any defects caused by misuse, misapplication, negligence, accident or failure to maintain or use in accordance with the most current operating instructions.
2. Unauthorized alterations.
3. Defects or failures caused by any replacement parts or attachments not manufactured by or approved by ROSCO.
4. Failure to conduct normal maintenance and operating service, including without limitation, providing lubricants, coolant, fuel, tune-ups, inspections or adjustments.
5. Unreasonable delay, as established by ROSCO, in making the applicable units or parts available upon notification of a service notice ordered by ROSCO.
6. The warranty responsibility on all engines and/or truck chassis rests with the respective manufacturer.
7. ROSCO may have support agreements with some engine and/or truck chassis manufacturers for warranty and parts support.

INTRODUCTION

LIMITED WARRANTY POLICY & PROCEDURES

C. ITEMS NOT COVERED

ROSCO is not responsible for the following:

1. Charges for travel time, mileage or overtime.
2. Charges related to transporting the product to and from the place at which warranty work is performed.
3. Freight charges related to transporting repair parts to the place at which warranty work is performed.
4. All used units or used parts of any kind.
5. Repairs made necessary by normal wear and tear or brought about by abuse or lack of maintenance of the equipment, except for premature failures.
6. Attachments not manufactured or installed by ROSCO.
7. Liability for incidental or consequential damages of any type, including, but not limited to lost profits or expenses of acquiring replacement equipment.
8. Miscellaneous charges.

D. OTHER WARRANTIES

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESSED, STATUTORY AND IMPLIED WARRANTIES APPLICABLE TO UNITS, ENGINES OR PARTS, WITHOUT LIMITATION, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE. IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT OR WARRANTY, OR ALLEGED NEGLIGENCE OR LIABILITY WITHOUT FAULT, SHALL ROSCO BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOSS OF PROFIT OR REVENUE, COST OF CAPITAL, COST OF SUBSTITUTED EQUIPMENT, FACILITIES OR SERVICES, DOWN TIME COSTS, LABOR COSTS OR CLAIMS OF CUSTOMERS, PURCHASERS OR LESSEES FOR SUCH DAMAGES.

INTRODUCTION

SPECIFICATIONS: CSH CHIPSPREADER

Rosco Manufacturing Company is continuously improving its products. The information found in this manual was correct at the time it was approved for publication.

DIMENSIONS

WHEEL BASE	126 inches (320 cm)
OUTSIDE TURNING RADIUS	246 inches (625 cm)
HEIGHT	100 inches (254 cm)
WIDTH (body).....	153 inches (389 cm)
MINIMUM GROUND CLEARANCE	7 inches (18 cm)
OVERALL LENGTH	294 inches (747 cm)
TRACK WIDTH, front	76.5 inches (194 cm)
TRACK WIDTH, rear	91 inches (231 cm)
WEIGHT (without hopper)	12,580 lbs (5706 kg)
TIRE SIZE (Std).....	385/65R x 22.50

DRIVE TRAIN

ENGINE:

Type	6-cyl, water cooled diesel
Make and Model	CAT 1106D-E66TA
Displacement.....	402 in ³ (6.6 liters)
Bore	4.10 inches (105 mm)
Stroke.....	5.0 inches (127 mm)
Power @ 2200 rpm	173 hp (129 kw)
Ignition System	12 volt
Battery (2).....	12 volt (950 CCA rated)
Alternator	100 Amp rated
Air Cleaner.....	Dry type, dual element
Oil Filter.....	full flow
Oil Capacity	34.9 pints (16.5 liters)
Idle Speed	600 rpm
Fuel Tank Capacity	50 gallons (189 liters)
Cooling System Capacity	31 quarts (29 liters)

STEERING Full Hydraulic, Orbitol Motor with Automotive Steering Wheel

HYDROSTATIC DRIVE SYSTEM:

Pump, Make and Model	Sauer/Danfoss H1 series
Pump, Displacement	10.07 in ³ (165 cc)
Motor, Make and Model.....	Sauer/Sundstrand 51 series
Motor, Displacement.....	6.10 CIR (100 cc)
Torque Hub, 4 wheel drive only	23.50:1 ratio
Control Handle.....	Sauer/Danfoss
Hydraulic Reservoir	50 gallons (189 liters)
Fluid Type	ISO 32 All Temperature
Filters	10 Micron, spin-on type
Oil Cooler.....	Flow-thru type

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AUXILIARY SYSTEMS

Pump, Load Sense	Sauer/Danfoss 6.10 in ³ (100 cc)
Motor, Conveyor (2)	Gerotor
Motor, Spreadroll	Gerotor

MISCELLANEOUS EQUIPMENT

Digital Display	Oil Pressure, Coolant Temperature, Voltmeter, Hourmeter, Hydraulic Temperature, Fuel Level, Tachometer
Engine Warning System	High Coolant Temperature/Low Oil Pressure
Seat (dual)	Suspension with Seat Belt
Dynamic Braking, rear (4WD).....	Dynamic Hydrostatic
Service Brakes, front	Hydraulic Power Assist Drum
Parking Brakes, rear (2).....	Spring Applied, Hydraulic Release
Horn.....	12 volt
Back-up Alarm.....	5db above ambient to 112 db
Front Hopper Sizes:	
10 ft (3.05 m)	2300 lbs (1043 kg)
11 ft (3.35 m)	2420 lbs (1098 kg)
12 ft (3.66 m)	2570 lbs (1166 kg)
13 ft (3.96 m)	2725 lbs (1236 kg)
13.5 ft (4.12 m)	2800 lbs (1270 kg)
14 ft (4.27 m)	2875 lbs (1304 kg)
14.5 ft (4.57 m)	2950 lbs (1338 kg)
15 ft (4.57 m)	3030 lbs (1374 kg)
16 ft (4.88 m)	3185 lbs (1445 kg)

OPTIONAL EQUIPMENT

Engine (202 hp).....	CAT 1106D-E66TA
Lights.....	Work Lights, Tail and/or Turn
Rotating Beacon.....	12 volt
Ether Start (Metered System)	12 volt
Engine Derates On.....	High Engine Temp/Low Oil Pressure
Aggregate Placement Screen	Wire Mesh
Stemco Axle Seals	
Second Hopper Agitator	
Tires and Wheels (Single Rear).....	11.00 x 22.50 Smooth Compaction
Tires and Wheels (Dual Rear).....	11.00 x 22.50 Smooth Compaction
Tires and Wheels (Single Rear).....	15.00 x 22.50 Duples Flotation
Tires and Wheels (Single Rear).....	11.50 x 22.50 Highway Tread

SAFETY

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SAFETY

SAFETY ALERT SYMBOLS

This Safety Alert symbol means
ATTENTION ! BECOME ALERT!
YOUR SAFETY IS INVOLVED!



The Safety Alert symbol identifies important safety messages on the ROSCO CSH Chipsreader and in its manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you ?

- 3 Big Reasons:**
- Accidents Disable and Kill
 - Accidents Cost
 - Accidents Can be Avoided

SIGNAL WORDS

Note the use of the signal words **DANGER**, **WARNING** and **CAUTION** with the safety message. The appropriate signal word for each message has been selected using the following guidelines:

DANGER: An immediate and specific hazard which **WILL** result in severe personal injury or death if the proper precautions are not taken.

WARNING A specific hazard or unsafe practice which **COULD** result in severe personal injury or death if proper precautions are not taken.

CAUTION Unsafe practices which **COULD** result in personal injury if proper practices are not taken, or as a reminder of good safety practices.

EQUIPMENT DAMAGE SYMBOL



Throughout this manual, whenever you see this “broken bolt” symbol, it means:

ATTENTION: Equipment on the machine could be damaged through improper performance of an operation, maintenance or repair procedure.

SAFETY

You are responsible for the safe operation and maintenance of your ROSCO Chipsreader. **You** must ensure that **you and anyone** else who is going to operate, maintain or work around the machine be familiar with the operating and maintenance procedures. Special attention should be given to learning and understanding the safety information contained in the manual.

In accordance with OSHA regulations 1928.51 and 1928.52, operating instructions must be provided initially to operators or employees before allowing them to operate the ROSCO Chipsreader, and at least annually thereafter.

The most important safety device on this equipment is a well trained and safe operator. It is his/her responsibility to read and understand all safety and operating instructions in this manual. A person who has not read and understood all operating and safety instructions is not qualified to operate the ROSCO Chipsreader. An untrained operator exposes himself/herself and bystanders to possible serious injury or death. All accidents can be avoided!

Do not modify the ROSCO Chipsreader in any way. Unauthorized modification may impair function and/or safety and affect the working life of the equipment.

ROSCO Manufacturing Company assumes **NO LIABILITY** for accident or injury incurred through the improper use of this equipment.

SAFETY PRECAUTIONS

GENERAL

1. **Read and fully understand** the Operator's Manual and the Safety Decals on the machine **before** trying to operate or service this equipment.



2. Have a first-aid kit available and **know how to use** it.



3. Keep a charged fire extinguisher within reach whenever you work in an area where fire may occur. Have the correct type of extinguisher for your situation and **know how to use it**.

Type A: Wood, paper, textile and rubbish

Type B: Flammable liquids

Type C: Electrical equipment

4. **Wear safe work clothing.** Do not wear clothing that is loose fitting or in poor repair when working on machinery. **Do not wear rings** or wrist watches when working on



machinery. They can catch on moving parts and pull you into the machinery, causing serious injury. Wear sturdy, rough-soled work shoes, safety glasses and any other protective gear that is warranted by the work environment.

5. Keep work area organized and clean. Wipe up oil spills of any kind. Keep tools and parts off floor. Eliminate the possibility of a fall which could result in serious injury.



6. **Wear appropriate ear protection** when exposed to loud noise for prolonged periods of time. Permanent loss of hearing can result from prolonged exposure.

7. **Do not hurry!** Use recommended hand holds and steps with at least three points of support when



SAFETY

getting on and off the Chipsreader. Keep steps, floor, hand holds and controls clean and free from grease. Face the machine when climbing up and down and **never** jump off or dismount while the machine is in motion. Falls from the machine can cause serious injury.



8. **Do not smoke** around machinery. Fuel, emulsion and the fumes from both can explode when exposed to flame or heat from smoking or other sources.

9. **Do not get in** or on top of the spread hopper when the Chipsreader is in operation or moving. Death or serious injury can occur from entanglement in moving parts.

10. **Always wear your seat belt.**

STARTING AND STOPPING PRECAUTIONS

BEFORE STARTING:

1. Walk around the Chipsreader and **warn all personnel** in the area before starting the machine. Do not start until the area is clear. Death or serious injury can occur to bystanders from being crushed under a moving machine or being hit by debris.

2. Before starting, **check brakes, steering and other control devices** in accordance with instructions. Be sure parking brake is applied, the Forward/Reverse control is in neutral and the right hand arm rest is **down**. Turn off conveyor and hopper controls.

3. Adjust, secure and latch the seat belt before starting the machine. Start or operate the machine **only** from the operator's seat.

4. **Do not bypass** the Chipsreader's neutral-start system. The system must be repaired if it malfunctions.



WARNING: *DO NOT operate the engine in an enclosed area without proper ventilation. Exhaust gases are orderless and deadly.*

WHEN PARKING:

1. Park the Chipsreader on level ground whenever possible and **always apply the parking brake**. On grades, park the Chipsreader with the wheels securely blocked.

2. Before leaving the operator's station, place the Forward/Reverse handle in neutral, turn off all accessories, conveyor and hopper controls, set the parking brake and **shut off the engine**.

3. Remove the ignition key when leaving the Chipsreader parked or unattended.

OPERATING PRECAUTIONS

1. Always comply with local regulations regarding moving equipment on public roads and highways. **DO NOT DRINK AND DRIVE and ALWAYS USE SEAT BELTS.**

2. Know and use the hand signals required for a particular job and know who has the responsibility for signaling.

3. Be sure that all lights and reflectors comply with state and local regulations. Make sure they are clean, in good working order and are clearly visible to all overtaking and oncoming traffic.



4. Do not stand between the equipment and the truck while the truck is being coupled with the Chipsreader. Death or serious injury can result from being crushed between the two machines.

5. **Do not permit riders** on the Chipsreader who are not provided with a specific seat and seat belt. Do not ride on hopper. Death or serious injury can result from riders falling off or under the machine while in motion.

6. The Chipsreader is designed to operate specifically on new seal coat surfaces which may be slippery. Therefore, the Chipsreader is designed with a **reduced braking capability** in order to prevent scuffing new surfaces. In some cases, the truck should assist in stopping.

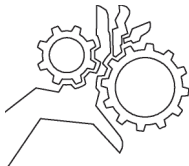
SAFETY

On other surfaces, stopping distances must be watched, particularly when towing a truck or going downhill. The larger the truck, the more slippery the surface, or steeper the grade, the longer the stopping distance. **Familiarize yourself** with these variables so that you can anticipate when a longer stopping distance is required.

7. Observe all gauges or warning instruments. **Do not operate unit** when a warning buzzer or light is "ON". Shut down the machine and report the problem to a supervisor. If the failure causes loss of control such as steering, service brakes or engine power, stop the Chipspreader motion as quickly as possible, apply parking brake, and keep machine securely parked until failure is corrected or the machine can be safely towed.

8. **Drive with care.** Make sure speed is compatible with conditions. **Use caution** on rough ground, slopes or when turning.

9. **Be alert for hazards** and obstructions such as ditches, trees, cliffs, overhead power lines or areas where there is danger of a slide. Be aware of and understand the job site traffic flow patterns and obey flagmen, road signs and signals.



10. Watch for bystanders and **never allow anyone** to be under or reach through the Chipspreader and its equipment while operating.

11. When roading a Chipspreader, **know and use required signaling devices.** Use tail lights, slow moving vehicle signs and/or a warning beacon when traveling on public roads. Provide an escort for roading when required.

12. **Do not tow** the Chipspreader, except to remove from road or to load on a trailer.

13. When towing with the Chipspreader, **only** use the Rear Truck Hitch.

MAINTENANCE PRECAUTIONS

1. **Do not attempt repairs unless trained.** Refer to manuals and experienced repair personnel for help.

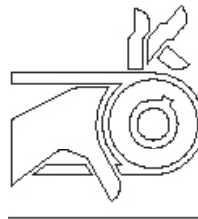


2. Wear safety glasses and other required safety equipment when servicing or making repairs.

3. Follow good shop practices: Keep service area clean and dry. Be sure electrical outlets and tools are properly **grounded.** Use adequate light for the job at hand. **Disconnect the battery** before working on the electrical system.



4. Place all controls in neutral, apply parking brake, shut engine off, remove ignition key and wait for all moving parts to stop before servicing or repairing equipment. Death or serious injury can occur from entanglement in moving parts.



5. **Block any working components** to prevent unexpected movement while repairs are being made. Securely block the machine and any components that may fall.

6. **Never make repairs** on pressurized components, fluid, gas or mechanical items until the pressure has been relieved according to instructions. Use **extreme caution** when removing radiator cap, drain plug, grease fittings or pressure taps.

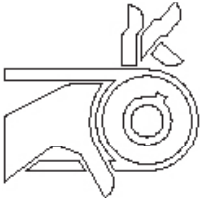
7. When inflating tires, use a **self-attaching inflation chuck** with remote shut-off and stand clear of the tire.

8. When servicing or replacing hardened pins etc., use a brass drift or other suitable material between the hammer and pin. Wear appropriate protection to prevent injury to face and eyes.

SAFETY

9. Do not operate the unit with loose wheels or rims. Check wheel nuts periodically for tightness. Refer to the Bolt Torque chart at the end of the **Maintenance Section** of this manual.

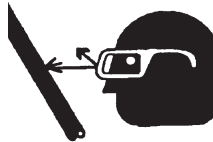
10. Keep brakes and steering systems in good operating condition.



11. Make sure all guards are in place and properly secured when maintenance work is completed. Death or serious injury can occur from entanglement in unguarded moving parts.

2. **Do not make repairs** using tape, clamps or cements. The hydraulic system operates under extremely high pressure and such repairs can fail, causing a hazardous condition.

3. Wear proper hand and eye protection when searching for a high pressure leak. Use a piece of wood or cardboard as a back stop instead of hands to isolate and identify leaks. **Do not use your hands.** Relieve pressure on the system before doing any repairs or disconnecting lines, hoses or valves. Before reapplying pressure to a hydraulic system, make sure all lines, fittings and couplings are tight and in good repair.



HOT MATERIAL PRECAUTIONS

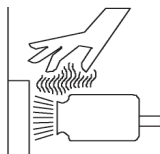
1. Wear protective gear for face, hands, feet and body when operating the Chipsreader.

2. When hot asphalt touches skin, flush area immediately with cold water. **Do not apply ice** to the affected area. **DO NOT ATTEMPT TO REMOVE ASPHALT CEMENT** with products containing solvents or ammonia. Natural separation will occur in about 48 - 72 hours. **Get medical attention as soon as possible!**



3. **Allow machine to cool** before repairing or maintaining working components.

4. **Do not remove radiator cap, drain plugs, or service grease fittings or pressure taps** when engine is hot. Add coolant to the radiator and perform other service only when the engine is stopped and fully cooled.



4. Pressurized hydraulic fluid or oil has sufficient force to penetrate the skin. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin. If injured by a high pressure steam or hydraulic fluid, **seek medical attention immediately.**



REFUELING PRECAUTIONS



1. **Handle fuel with care.** It is highly flammable. When refueling, keep the hose nozzle or funnel in contact with the metal of the fuel tank to avoid an electrical spark igniting the fuel. Maintain control of filler nozzle.

2. Clean up spilled fuel before restarting the engine. A spark could ignite the spillage.

3. **Do not smoke** when refueling and **never refuel** when the engine is running. **Do not refuel** the machine near open flame or sparks. **Do not use fuel** for cleaning purposes. Death or serious injury can occur from explosion or fire.



HYDRAULIC SYSTEMS PRECAUTIONS

1. Make sure that all components are in good working condition. Replace any worn, cut, abraded, flattened or crimped hoses and metal lines.

SAFETY

- Fill fuel tank outdoors to reduce the chance of fumes accumulating and causing a fire or explosion. Keep the hose nozzle or funnel inside the tank while filling to avoid spilling fuel. Spilled fuel is a fire hazard.



- Prevent fires** by keeping the machine clean of accumulated debris, grease and spilled fuel.



- Do not fill tank to capacity.** Allow room for expansion. Expansion and spillage create a fire hazard.

- Tighten fuel cap securely. If fuel is lost, replace it only with the original manufacturer's approved cap. A non-approved cap may result in pressurization of the tank.

- Use the correct fuel grade for the operating season. Refer to the Hydraulic Fluid chart in the **Maintenance Section** of this manual.

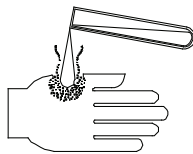
BATTERY PRECAUTIONS

- Keep all sparks and flames away from batteries. Fumes from the battery's **electrolyte solution is extremely explosive**. Acid propelled by an explosion can cause blindness if it comes in contact with eyes.



- Always wear safety glasses** when working near batteries. If you come in contact with battery electrolyte solution, **wash off immediately**. Chemical burns can cause injury.

- Do not tip batteries more than 45 degrees to avoid spilling electrolyte solution and causing a chemical burn.



- To avoid injury from a spark or short circuit, **disconnect the battery ground cable** before servicing any part of the electrical system. Failure to do so can result in electrical shock or burns.

- Use jumper cables **only** in recommended manner. Improper use can result in battery explosion or unexpected Chipsreader motion. Refer to the Engine and Battery pages of the **Maintenance Section** of this manual.

TIRE PRECAUTIONS

WARNING: *DO NOT mount or demount tires without proper training. A violent explosion like a bomb can occur.*



Follow all procedures and safety instructions. Wall charts containing mounting and demounting instructions for all rims are available through the United States Department of Transportation (DOT), Washington, D.C.

Note: When in doubt, have a qualified tire dealer or repair service perform required tire maintenance.

INSPECTION

- Clean and repaint rims to stop corrosion and to facilitate checking and tire mounting. Clean all dirt and rust from the lock ring and gutter. **This is important** to secure the lock ring in the proper position.

- Check rim components periodically for cracks. Replace all cracked, badly worn, damaged and severely rusted components with new parts of the same size and type. If you are not sure about proper mating of tire and wheel parts, consult a rim and wheel expert. This may be the tire man servicing your equipment or the rim and wheel distributor in your area.

- Do not rework**, weld, heat or braze any rim components that are cracked, broken or damaged. **Replace** with like parts. Mixing parts of one type with those of another is potentially dangerous.

SAFETY

4. **Do not reinflate** a tire that has been run flat without first inspecting the tire, tube, flap, rim and wheel assembly. Double check the side ring and the “O ring” for damage and make sure that they are secured in the gutter before inflation.

DEMOUNTING

1. **Remove valve core** to exhaust all air from tire. **Always** exhaust all air from tire prior to removing rim components or wheel components such as nuts or rim clamps. Check the valve stem by running a piece of wire through the stem to make sure it is not plugged.

2. **Do not demount** a tire unless you have the proper equipment and experience to do the job.

MOUNTING AND INFLATION

1. Do not seat rings or other components by hammering while tire is inflated or partially inflated. Double check all components prior to inflation.

2. **Do not inflate** a tire before all components are properly in place. Place tire in a safety cage and inflate to approximately 10 psi. Recheck components for proper assembly. If assembly is wrong, deflate and correct.

3. **Never hammer** on an inflated or partially inflated tire/rim assembly. If assembly is proper at 10 psi, continue to inflate to fully seat the tire beads. Then completely deflate the tire to prevent localized overstretching of the tube. Reinflate to recommended operating pressure.

4. Never sit on or stand in front of a tire/rim assembly being inflated. Use a clip-on chuck and make sure inflation hose is long enough to permit the person inflating the tire to stand to the side of the tire.

5. **Do not hammer** components with steel hammers. Use rubber, lead, plastic or brass faced mallets to tap components together.

SERVICING TIRE AND RIM ON VEHICLE

1. **Do not drive** an assembled or partially assembled tire/rim over a cast spoke wheel by hammering. **STOP!** Deflate and examine to determine the reason for the improper fit. Look for distortion or components that are not properly locked or seated.

2. Block the tire and wheel on opposite side of the vehicle before you place the jack in position. **Always** put hardwood blocks under the jack and crib up the vehicle in case the jack slips.

OPERATION

1. **Do not inflate tires** beyond the maximum recommended inflation pressure.

2. **Never run** a vehicle on one tire of a dual assembly. The carrying capacity of the single tire and rim is dangerously exceeded, and operating a vehicle in this manner can damage the rim and tire.

WARNING: *Mismatched rim parts are dangerous and could cause SEVERE injury.*



BRAKING PRECAUTIONS

1. The operator must become accustomed to using the Hydrostatic Transmission to assist in braking. This is done by moving the Speed/Direction Joystick into the neutral position before applying the Service Brakes with the foot pedal.

2. The Service Brakes alone are **not sufficient** to stop the Chipspreader if it is operating in a Forward or Reverse drive mode.



CAUTION: *Do not engage the park brake while the machine is in motion. Instantaneous damage will occur.*

SAFETY

3. Stopping distances must be carefully anticipated when towing a truck and/or going downhill. The larger the truck being towed or the steeper the grade, when going downhill, the longer it will take to stop the Chipsreader. In some cases, the truck being towed should assist in braking. Advise the truck driver of this requirement.

4. Familiarize yourself with road conditions and road surface variables so you can anticipate when a longer stopping distance is required.

STORAGE PRECAUTIONS

1. Store the Chipsreader in an area away from human activity.

2. Do not permit children to play on or around the stored machine! Serious injury can occur from falling from the machine.

3. Make sure the unit is stored in an area that is firm, level and free of debris.

4. Store the machine inside a building or cover securely with a weatherproof tarpaulin.

SAFETY DECALS

1. Become familiar with the content and position of each safety decal. **Important information** is written on the decals. The location and description of each safety decal is described or illustrated on the following pages.

2. Keep safety decals and signs clean and legible at all times

3. Replace all missing, illegible or damaged safety signs.

4. When replacing parts that previously displayed a safety decal, be sure to replace the decal.

5. Obtain safety decals or signs from your authorized ROSCO Dealer.

DECAL INSTALLATION

1. Be sure that the installation area is clean and dry. Use hot soapy water and dry the area thoroughly before installing decals.

2. Decide on the exact position by taking measurements and test fitting before you remove any of the backing paper.

3. For decals with no top protection paper, decide on the decal location and remove the smallest portion of the split backing paper.

4. Align the decal over the specified area and carefully press the small portion with the exposed adhesive backing into place.

5. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.

6. Small air pockets can be pierced with a pin and smoothed out using the piece of decal backing paper.

7. If the decal has a protective top paper, use hot soapy water on the surface to which the decal is being applied. Leave wet. After deciding on the location, remove the backing paper and soak the decal in clean soapy water before application. This will help prevent air bubbles in the finished decal.

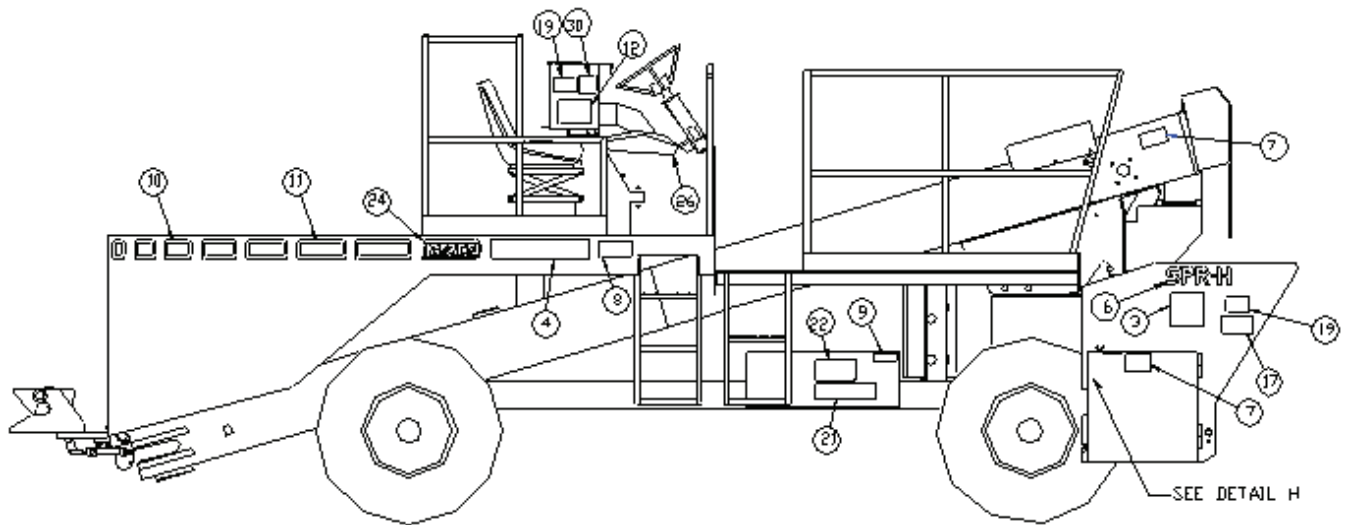
8. Smooth the decal into place with a sponge and check for air bubbles. Small air pockets may be pierced with a pin and smoothed out. When the decal is completely smoothed out, carefully remove the top paper.

SAFETY

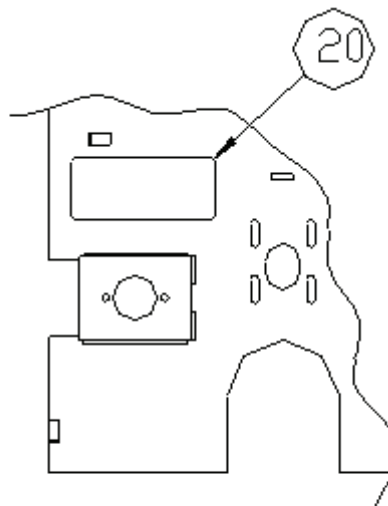
SAFETY DECAL LOCATIONS

The types of Safety Decals and their location on the Chip Spreader are shown in the illustrations that follow. Good safety requires that you familiarize yourself with the various Safety Decals, the type of warning and the area or particular function related to that area, which requires your SAFETY AWARENESS.

The numbers on the illustrations show the placement of all decals on the Chip Spreader and refer to the list of decal parts found in the Parts Book Section of this manual. The Safety Decals are illustrated on the following pages and use the same numbers for easy reference.

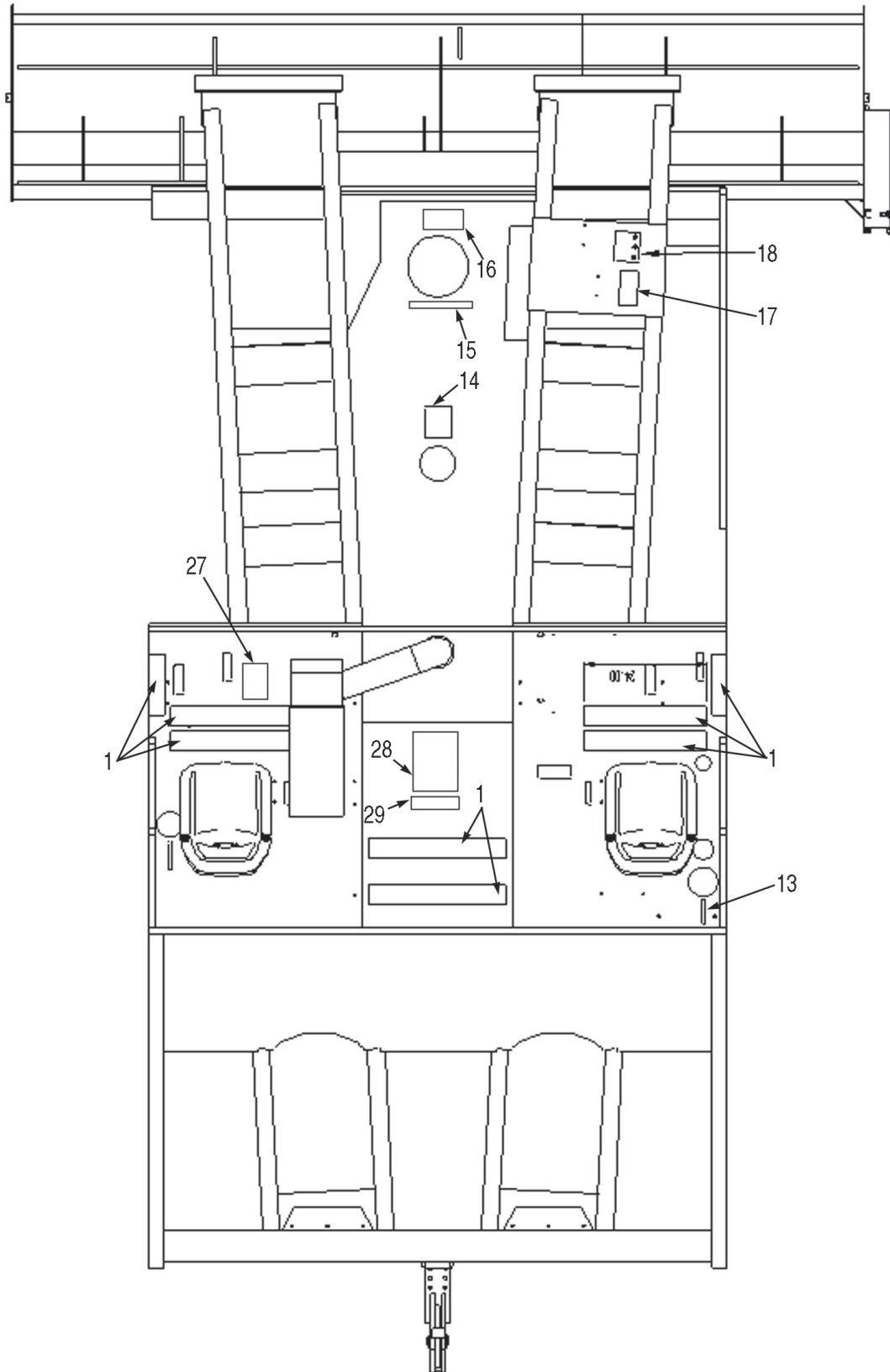


RIGHT SIDE VIEW



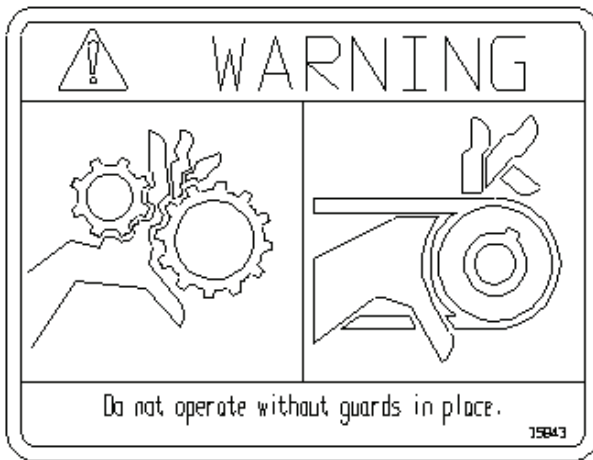
DETAIL H
SHOWN WITH CHAIN GUARD REMOVED

SAFETY



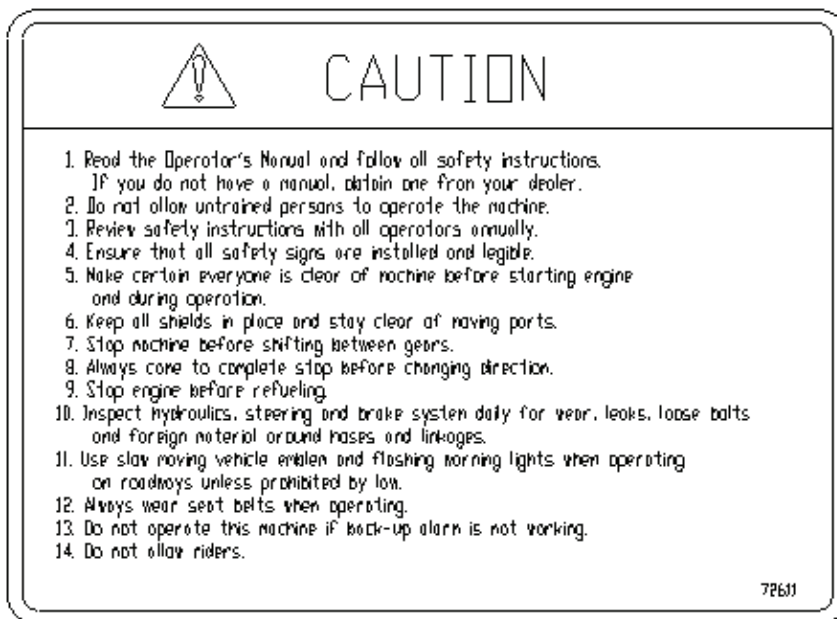
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SAFETY



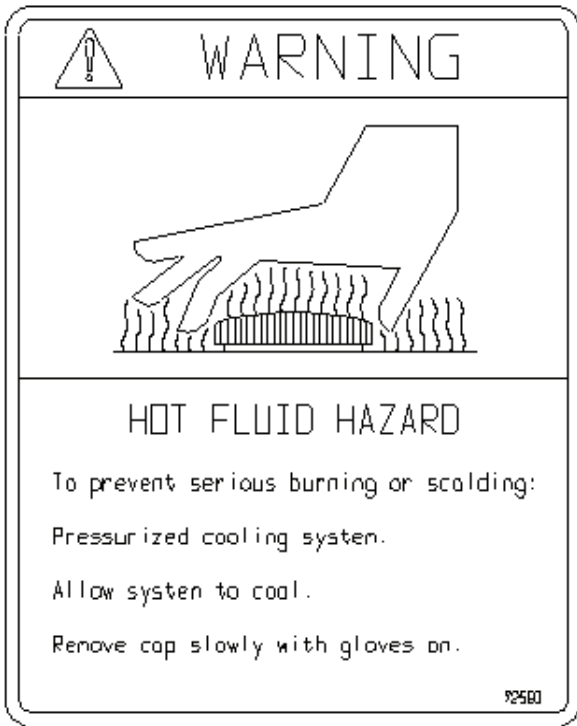
DECAL 7 --- P/N 35943

DECAL 8 --- P/N 36202

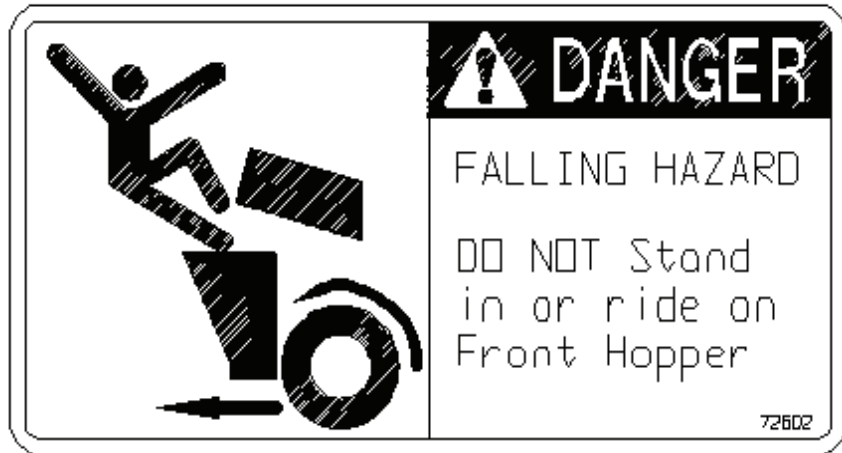


DECAL 12 --- P/N 72611

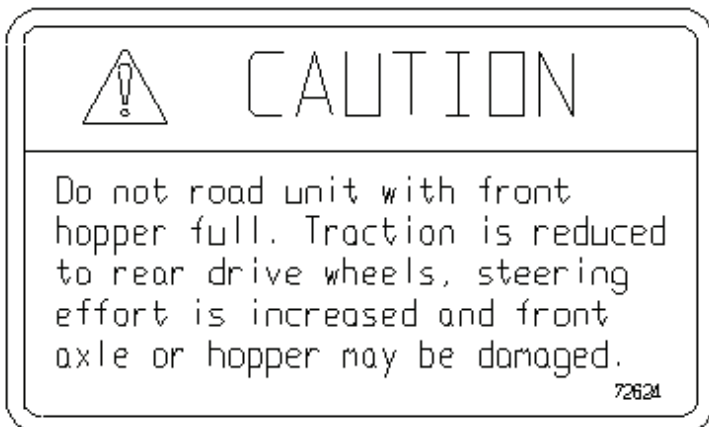
SAFETY



DECAL 14 --- P/N 72590

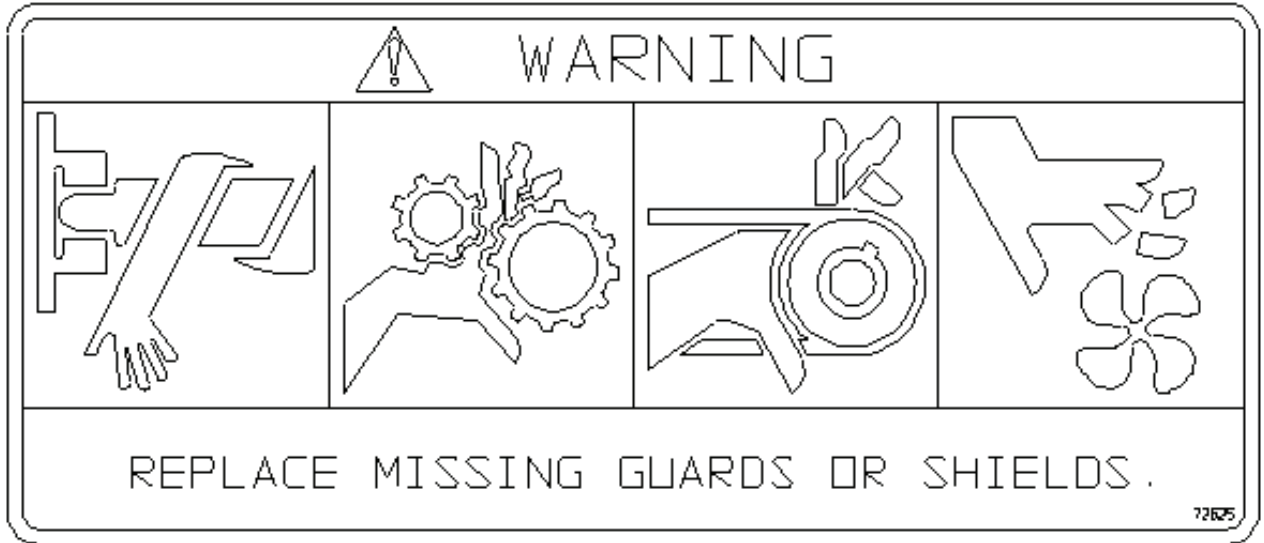


DECAL 17 --- P/N 72602

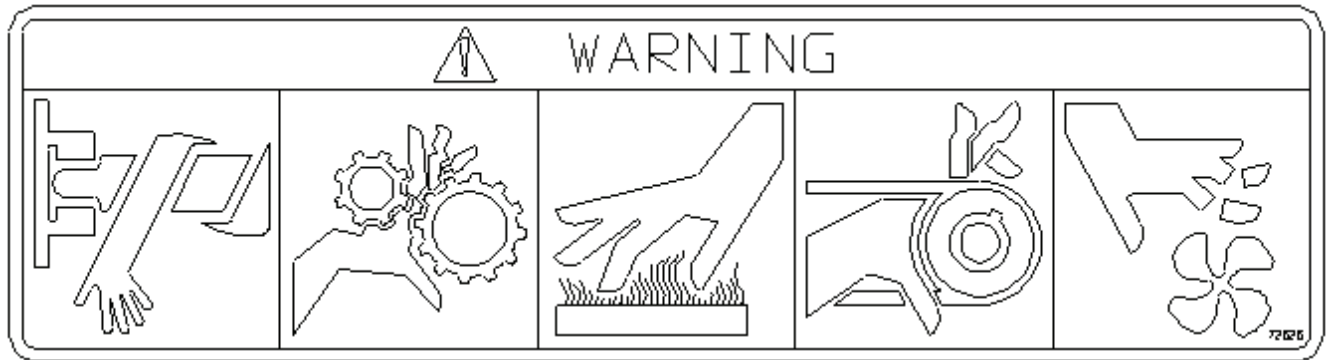


DECAL 19 --- P/N 72624

SAFETY

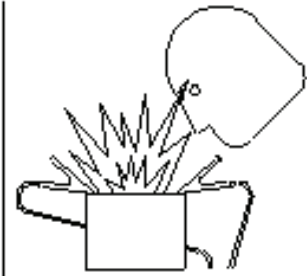

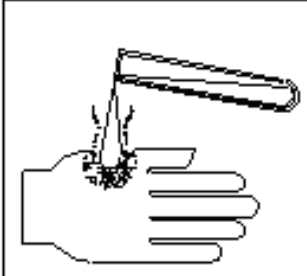


DECAL 20 --- P/N 72625




DECAL 21 --- P/N 72626

SAFETY

		<p>WARNING</p>
	<p>PREVENT SERIOUS BODILY INJURY CAUSED BY: EXPLOSIVE BATTERY GASES. Keep sparks and flames away from the battery. Refer to the Operator's Manual for battery boosting and charging procedures. CORROSIVE AND POISONOUS BATTERY ACID. Acid can severely burn your body and clothing.</p>	
<p>72627</p>		

DECAL 22 --- P/N 72627

	<p>WARNING</p>
<p>CALIFORNIA</p>	
<p>Proposition 65 Warning Engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.</p>	
<p>Always use care to avoid breathing this exhaust.</p>	
<p>37243</p>	

DECAL 30 --- P/N 37243

OPERATION

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OPERATION

GENERAL

The ROSCO Hydrostatic Drive Chipspreader, with front wheel drive and optional 4-wheel drive, was designed and built to handle and accurately apply all **uniform** types of aggregate materials to road surfaces. In addition, the Chipspreader was designed to permit operation by a single person, the driver, from either side of the machine.

Note: Non-uniform materials such as sand with wet and dry spots will have an increased range of dispersal. A non-satisfactory seal will result.

To obtain the maximum performance and efficiency designed into the Chipspreader, owners and operators **must** identify and understand the function and operation of all systems and components. All functions of the unit are covered in this section and it is vital that the operator read this entire section **before** operating or servicing the unit.

The ROSCO Chipspreader may be delivered with various options installed, depending on the requirements of the job or customer specifications. This manual describes available options, some of which may not be included on your Chipspreader. Disregard those sections of the manual referring to equipment and features not supplied with your unit.

AGGREGATE SELECTION AND APPLICATION

The ROSCO Chipspreader is capable of spreading a wide variety of aggregate in the surface treatment of asphalt pavements. Such treatments are used to seal the asphalt surface from weathering problems caused by water and air permeation, and as an aid in preventing traffic wear to the pavement, thus extending the pavement life while providing a better non-skid surface.

The Chipspreader produces a higher duration chip seal because of the aggregate separation effect of the spreadroll. The rotation of the spreadroll throws the larger aggregate ahead so they land in the asphalt before the smaller particles. The smaller particles then "chock" the larger particles in place. The effect of this system is not only a chip seal with a longer life by better bonding of all sized particles, but less chance of particles becoming loosened by traffic and causing damage to vehicles.

TYPES OF TREATMENTS

Usually, there are three types of asphalt/aggregate surface treatments used. The three treatments are:

Single Surface Treatment - This treatment is used to prevent wear and aid in waterproofing a surface. It involves a single pass of sprayed asphalt followed at once by a single layer of aggregate.

Multiple Surface Treatment - This treatment provides greater surface protection against both traffic wear and weather. It is made by using two or more alternating layers of asphalt and aggregate. Each succeeding layer of aggregate should be no more than one half the size of the aggregate in the preceding layer.

Sand Seal - This treatment is used to provide a tight seal against the weather and to make the surface more skid resistant. Its construction is comparable to a Single Surface Treatment.

MATERIAL SELECTION

In general, the majority of **hard** aggregates can be used for aggregate/asphalt surface treatments. Aggregate for sand seal treatment may consist of sand or screenings. However, all aggregate should meet the following requirements:

OPERATION

1. It should be as uniform in size as is economical. Generally, the biggest particle should be no more than twice the size of the smallest particle.

2. Aggregates of 1/2 inch (13 mm) or less provide a quieter, smoother road surface. Larger aggregate will provide a more skid-resistant surface, but will create more noise so are most often used in non-populated areas.

3. The best aggregate shape is cubical. Flat or elongated shapes may be completely buried in asphalt that is needed to hold cubical shaped aggregate. The fewer flat or elongated shapes in the aggregate the better.

4. Aggregate must be clean. Coatings of dust, silt or clay prevent adhesion to the asphalt and interfere with uniform spreading. Both problems will lessen the life of the surface treatment.

5. Aggregate should be as dry as possible and warm. Dry aggregate will adhere to the asphalt better. Surface treatments are best applied when the temperature is 50°F (10°C) or above. The surface being treated should also be dry and warm.

6. Dry sand is best for most application. Sand naturally holds and attracts water which makes even application difficult. Wet sand will bridge and therefore may not flow as required.

4. The gate opening should be at least 2 times (i.e. 1/2 inch aggregate needs a gate opening of 1 inch) the size of the aggregate for uniform feeding. However, the gate opening will vary with the size of aggregate used and the uniformity of the aggregate. Use the 2 times aggregate opening as a starting point and test the spreading rate (see Starting Spread Rate) before starting each job to make any adjustments needed.

ROLLING

Chip seal treated surfaces should be rolled with pneumatic-tired rollers **only**. Pneumatic-tired rollers provide even pressure to all particles and slight depressions in the surface. Steel drum rollers will bridge over any small depressions in the surface or smaller particles of aggregate. They also crush softer particles and degrade the surface.

FINISHING A TREATED SURFACE

Light brushing with a rotary powered brush should be done to clean the surface of excess aggregate before traffic flow is restored. The sweeping process should be done after the asphalt has had sufficient time to set and bond. Early morning is a good time to do the surface treated the day before.

SPREADING THE AGGREGATE

The following steps should be taken to assure a successful asphalt/aggregate surface treatment:

1. Have all aggregate on hand before starting treatment.

2. Cover sprayed asphalt with aggregate within 30 seconds of spraying.

3. Spread aggregate evenly. Aggregate will not stick more than one particle thick and excess may actually loosen adhered aggregate by the action of the traffic on the surface.

OPERATION

FUNCTIONAL DESCRIPTION

HYDROSTATIC DRIVE

The ROSCO Chipspreader is a diesel engine powered, dual-range hydrostatically driven aggregate spreading machine. The hydrostatic drive system on the Chipspreader propels the unit forward and reverse at varying speeds with dynamic braking action.

A turbocharged after-cooled CAT 1106D-E66TA, 173 HP, is the standard equipment diesel engine in the Chipspreader. A CAT 1106D-E66TA, 202 HP turbocharged after-cooled engine is available as optional equipment.

Components of the hydrostatic drive system include:

- ☞ one variable displacement axial piston pump direct coupled to the diesel engine.
- ☞ one high-torque bent axis hydraulic motor, at the front axle, which receives hydrostatic power for the pump.
- ☞ (4 WD unit only) two torque hubs coupled to the hydraulic motors, which provide 4-wheel drive to the wheels and tires.

Three driver-selectable ground speed modes are provided to accommodate a wide range of requirements:

Low Automatic - A programmable mode that allows the operator to pre-set Chipspreader maximum ground speed for accurate and repeatable applications. Top speed in **Low Automatic** is approximately 880 ft/min or 268 m/min (10 mph or 16 km/h), depending on engine and tire options. At speeds less than the set maximum speed, the operator has full control.

Low Manual - A programmable mode that allows the operator to adjust Chipspreader ground speed and direction with the Joystick. Top speed in **Low Manual** is approximately 880 ft/min or 268 m/min (10 mph or 16 km/h), depending on engine and tire options.

High Manual - A programmable mode that allows the operator to adjust Chipspreader ground speed for travel between spreading locations. In this mode, electric controls adjust the position of the hydraulic drive motor swash plates to provide the same effect as the high range gear in a two-speed axle. Top speed in **High Manual** is approximately 1760 ft/min or 537 m/min (20 mph or 32 km/h), depending on engine and tire options.

Note: Further details on ground speed modes can be found later in this section.

OPERATION

CONVEYOR BELT ADJUSTMENT

Proper alignment and tension adjustment of the conveyor belts is necessary to deliver proper system operation and maximum life from the components. Instructions for verifying correct belt alignment and tension can be found in the Maintenance Section of this manual.

If mis-alignment or slack is noticed in a conveyor belt, make adjustments as soon as possible to prevent premature wear of the belt and related components.

AGGREGATE DELIVERY SYSTEM

Components of the aggregate delivery system on the ROSCO Chipsreader are illustrated in Figures 1, 2, and 3. In the following paragraphs, except where other figures are referenced, the numbers in parenthesis () refer to item numbers in these figures.

A. Receiving Hopper

Hopper - Aggregate material is delivered by a dump truck into the 4.0 yd³ (3.0 m³) capacity rear folding hopper known as the **receiving hopper (13)**. The receiving hopper is equipped with rubber **sealing skirts (14)** to seal the receiving hopper to the truck dump box during operation.

Feed Gates - A **feed gate (12)** is provided in the receiving hopper for each conveyor to permit control over the amount of aggregate being conveyed to the spread hopper.

B. Conveyors

Belts - Two hydraulic motor-driven 20 inch (508 mm) wide **conveyor belts (10)** move the aggregate from the receiving hopper to the front spread hopper. The **conveyor drive motors (16)** are mounted on top of the conveyor assembly at the front of the Chipsreader.

Chute Lining - Rubber **chute liners (9)** seal each side of the conveyors to prevent spillage of aggregate. The chute liners are held in place by **channel strips (8)** bolted to the conveyor frame.

The chute liners can be adjusted to maintain even contact with the conveyor belts.

Pulleys - Drive, tension and suspension for the conveyor belts are provided by various pulleys attached to each conveyor frame. Figure 4 shows the relative location of these pulleys.

The **head pulley** (item 1, Fig. 4), located at the spread hopper end, is driven by the hydraulic motors and drives the conveyor belts.

The **tail pulley** (item 3, Fig. 4), located at the receiving hopper end, can be used to adjust the tension of the conveyor belt.

A number of **trough idlers** (item 2, Fig. 4), an **adjustable idler** (item 4, Fig. 4) and two **rolling pulleys** (item 5, Fig. 4) are located between the head and tail pulleys to provide suspension and tension adjustment for each conveyor belt.

Deflectors - There are two types of deflectors located at the spread hopper end of each conveyor. Refer to Figure 3.

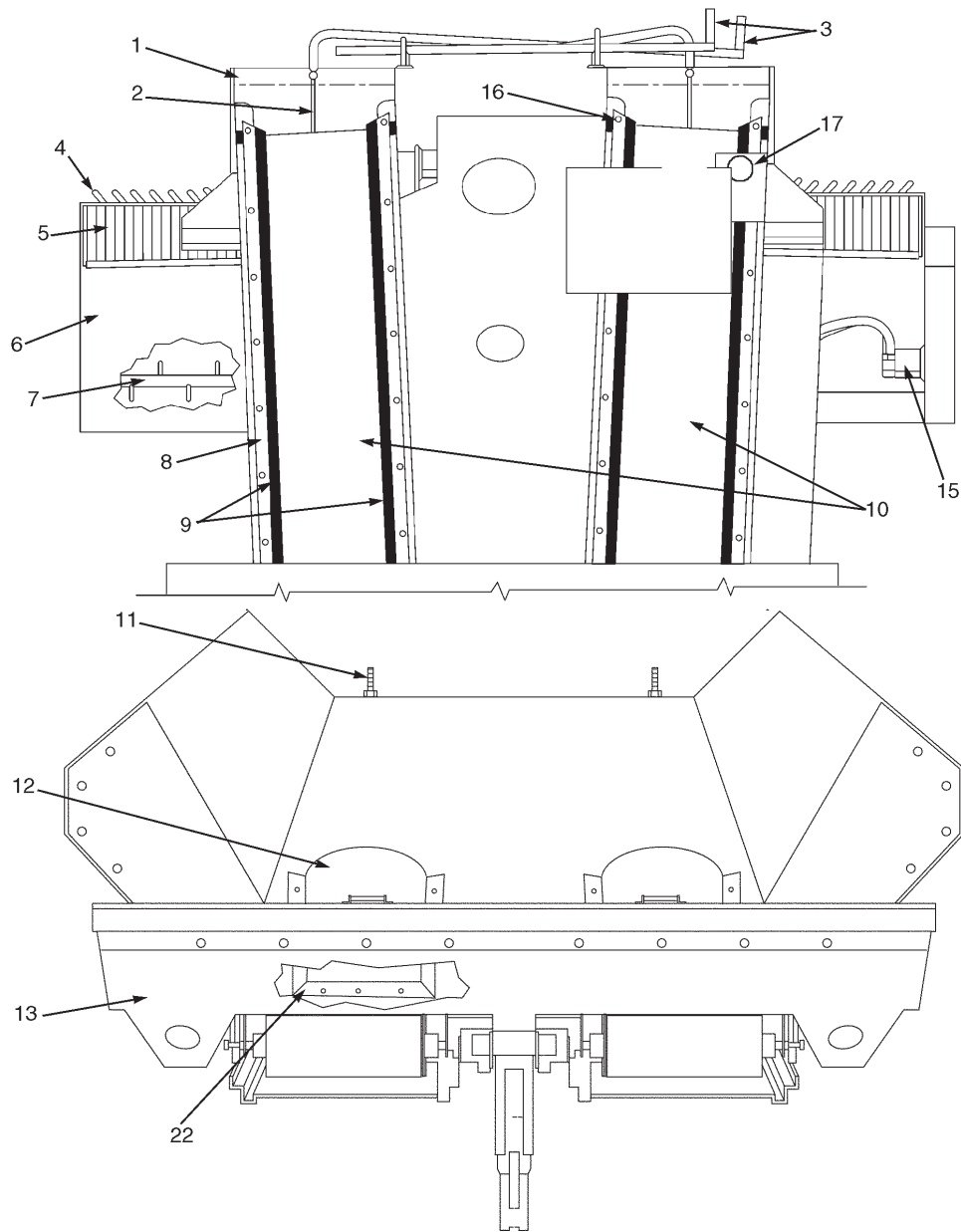
The **deflector hood (1)** is attached by four bolts to the conveyor frame. This deflector is used to control the distribution of aggregate into the spread hopper so that, depending on the speed of the conveyors, the aggregate lands in the center of the hopper and doesn't spill over the front edge. Adjustment of the deflector hood is shown in Figure 5.

The **vertical plate (2)** is used to control the stream of aggregate flow from side to side in the hopper. **Reach rods (3)** are provided which allow adjustment of both vertical plates from the right side of the Chipsreader. When spreading with less than the full hopper width, these vertical plates can be adjusted to direct aggregate flow to the engaged (active) cut-off gates.

C. Spread Hopper

The spread hopper is attached to the front of the Chipsreader and is responsible for accurate application of the aggregate to the road surface. Spread hoppers are available in various widths from 10 to 15 feet (3 to 5 meters) to meet customer or job specifications.

OPERATION



LB001

Figure 1
Chip Spreader - Top View

- | | |
|----------------------------------|---------------------------------|
| 1. Deflector Hood | 10. Conveyor Belt |
| 2. Vertical Plate Deflector | 11. Feed Gate Adjuster |
| 3. Vertical Deflector Reach Rods | 12. Feed Gate |
| 4. Cut-Off Gate Levers | 13. Receiving Hopper |
| 5. Reject Screens | 15. Motor, Agitator/Spreadroll |
| 6. Spread Hopper | 16. Motor, Conveyor |
| 7. Agitator Shaft | 17. Auxiliary Conveyor Switches |
| 8. Channel Strip | 22. Lagging Skirts |
| 9. Chute Liner | |

OPERATION

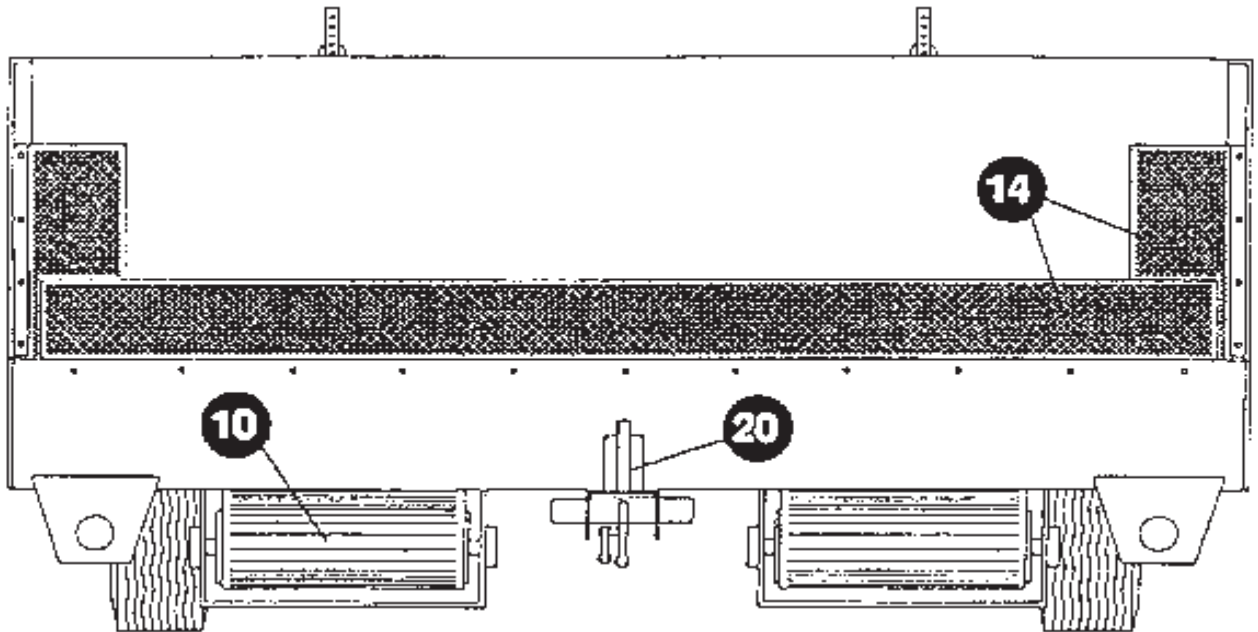


Figure 2
Chip Spreader - Rear View

- | | |
|---------------------------------|---|
| 1. Deflector Hood | 14. Sealing Skirts |
| 2. Vertical Plate Deflector | 16. Motor, Conveyor |
| 3. Vertical Deflector Reach Rod | 19. Auto Conveyor Belt Cut-Off Switches |
| 6. Spread Hopper | 20. Truck Hitch |
| 10. Conveyor Belt | 21. Belt Wiper |

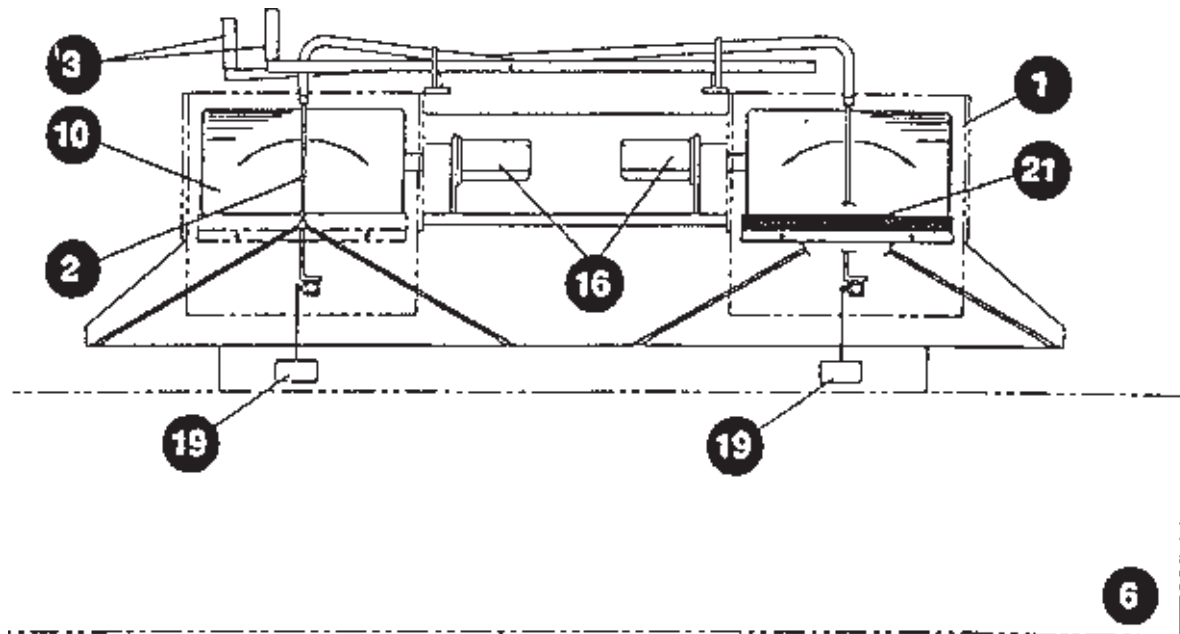
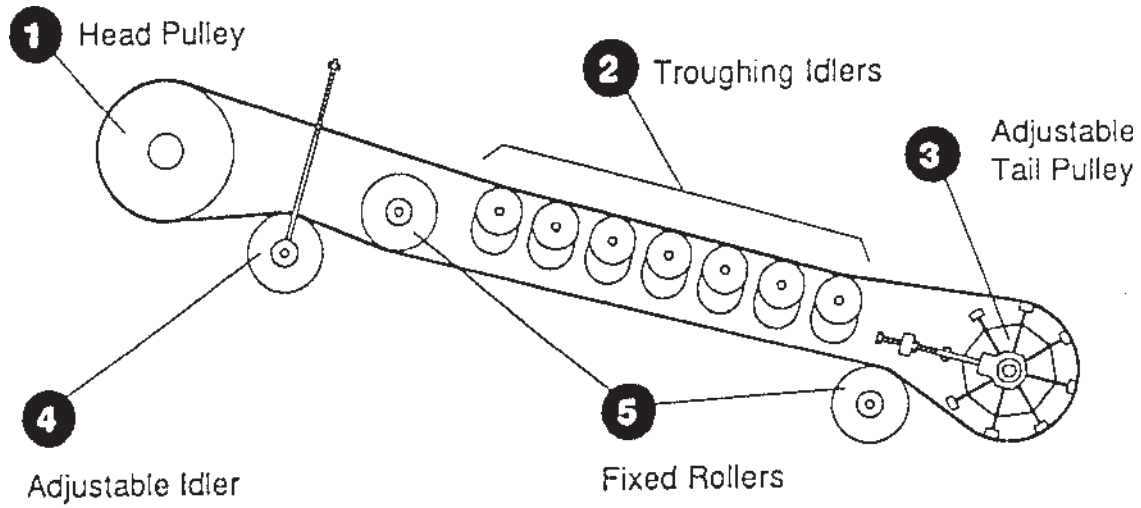
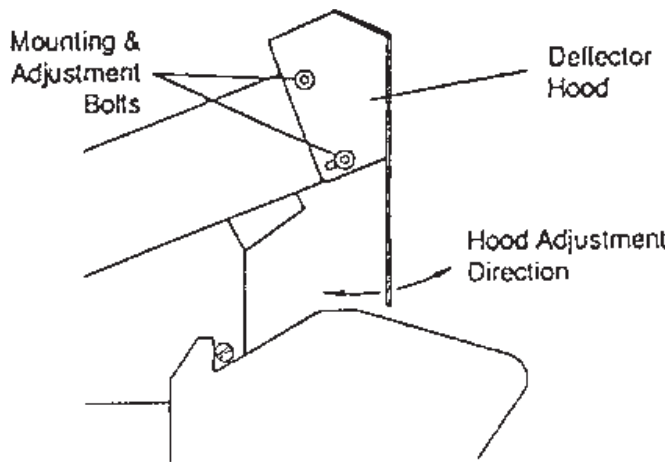


Figure 3
Chip Spreader - Front View

OPERATION



*Figure 4
Conveyor Pulley Schematic*



*Figure 5
Deflector Hood Adjustment*

OPERATION

Reject Screens - At the top of the spread hopper are **reject screens (5)**, also known as grizzly screens, which prevent oversized aggregate, sticks or other debris from entering the hopper.

Agitator - An **agitator shaft (7)** is located inside the spread hopper which rotates to keep the aggregate flowing to the spreadroll and prevent "bridging". The agitator and the spreadroll are driven by a **hydraulic motor (15)** through a sprocket gear and chain arrangement.

Cut-off Gates - Cut-off gates, in 6 and 12 inch (152 and 305 mm) widths, on the spreadroll allow spreading width adjustments from 6 inch (152 mm) to the full width of the hopper. The operator can engage or disengage individual cut-off gates with hand operated **cut-off gate levers (4)**. When engaged (active), the cut-off gates are opened and closed by an electro-hydraulic power gate control system which is operated by the driver (See "*Operating Instructions*").

Spreadroll - The spreadroll forms the bottom of the spread hopper. When the spreadroll is rotating, it moves the aggregate out of the hopper through the cut-off gate openings and onto the road surface.

The hitch height is controlled by two buttons at the control console. The hitch will automatically lock and can be released by using the **push button located on the control panel (Item 42, figure 6)** or, if equipped, the optional button at the right walkway.

Further details on the truck hitch and instructions for installing the truck pull bar can be found in this section of the manual. (See "*Truck Hitch Installation*").

AUTOMATIC CONVEYOR CUT-OFF SWITCH

The **automatic conveyor cut-off switch (19)** is a limit switch located at the hopper that automatically shuts off the conveyors when needed while the unit is being controlled by a single operator. This switch is tripped when the paddle that is connected to it is pushed by a build up of aggregate. It is released as the spread hopper empties.

TRUCK HITCH

The ROSCO Chipspreader is equipped with a positive-latching, hydraulic-release **truck hitch (20)**, that secures the Chipspreader to a pull bar on the dump truck.

OPERATION

CONTROL PANEL

The numbered items that follow refer to the callout numbers shown in Fig. 6.

1. Graphic Display controls and shows several operations of the unit, including Engine monitoring functions (RPM, Oil Pressure, Water Temperature and Voltage), Hydraulic Oil Temperature, and Fuel Level.
2. Joystick controls Forward/Reverse operation of machine with additional buttons for Opening Aggregate Gates, Releasing Hitch, and Moving Wings Up/Down.
3. Key Pad controls operation of Machine Modes (Manual, Auto, and Travel), Hitch Release, Raise Hitch, Auto Restart, Lower Hitch, Spreadroll On/Off, Hopper Dump, Left & Right Conveyor Speed Control and Left and Right Conveyor Mode (Auto/Manual).
4. Key Switch controls most On/Off functions for the unit including starting the engine.
5. Throttle controls Engine RPM in 400 RPM increments to max RPM of 2200.
6. Four-Wheel Drive On/Off. If available.
7. Park Brake On/Off. Interlocks with start system.
8. Circuit Breakers, electrical wiring protection:
 - Circuit Breaker #1: 5 AMP; Power for Display, Joystick and Key Pad.
 - Circuit Breaker #2: 25 AMP; Power for CPU.
 - Circuit Breaker #3: 10 AMP; Power for Beacon.
 - Circuit Breaker #4; 25 AMP; Power for Brake Lights.
 - Circuit Breaker #5; 25 AMP; Power for Lights and Turn Signals.
 - Circuit Breaker #6; 10 AMP; Power for Remote Panel.

Lights and Beacon Functions are self-descriptive.

Description of Operation:

The Chip Spreader Hydro (CSH) is a vehicle that is used to distribute chip rock over road sealant. The machine is propelled with a hydrostatic transmission with a single two-speed motor driving an axle. Also, there is an optional four-wheel drive system

with two additional motors that have two speeds. The chip material is emptied into the CSH using a typical dump truck. The chip material is conveyed into the hopper at the rear of the machine using two independent conveyors. Once the material is in the hopper, the flow out of the hopper uses a mechanical gate. The conveyors and gate opening are hydraulically controlled. Within the hopper, a spread roll rotates to agitate the chip material to keep the flow out of the gates consistent. A Plus 1 control system is required to control propel, gate, spread roll, hopper wings, and conveyors.

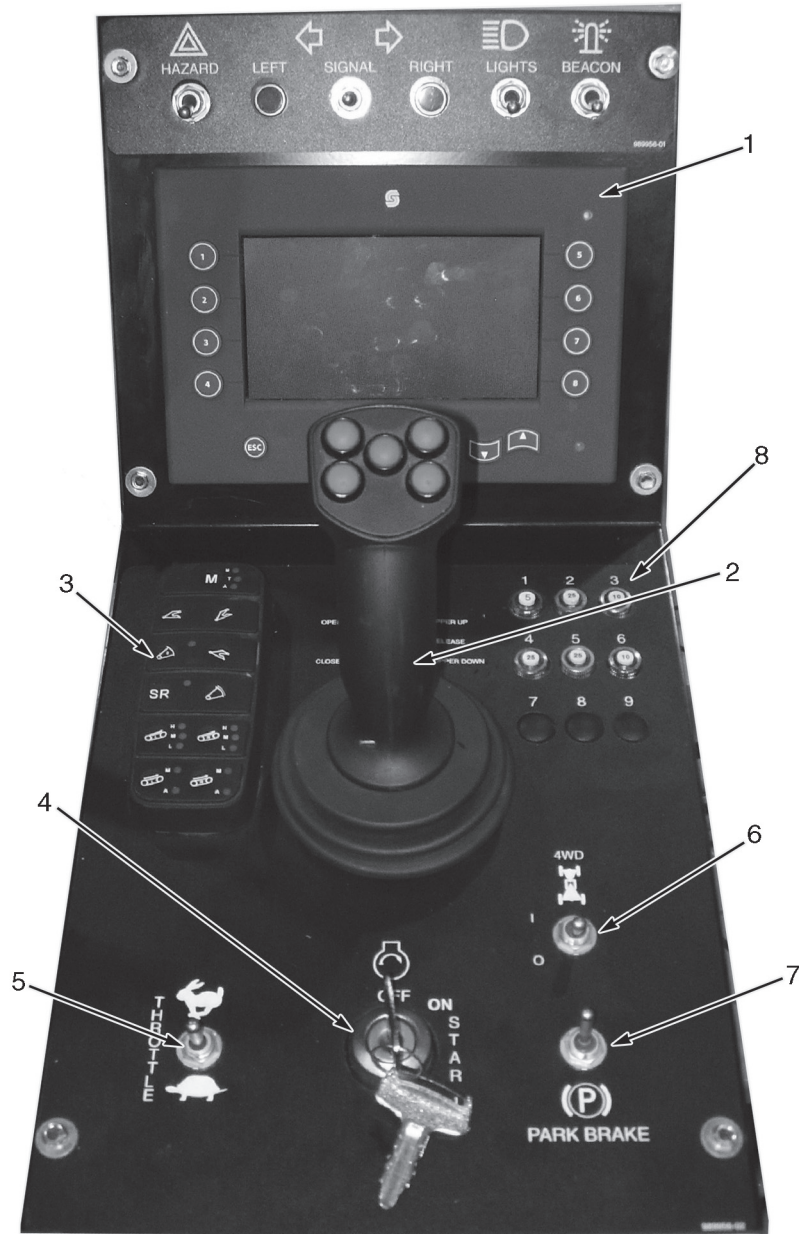
The CSH has three modes of operation: Auto, Travel, and Manual. All will be controlled via the Plus 1 system. The system will include a Plus 1 controller, DP610 display, CAN friction held joystick, and CAN switch pad.

Manual Mode - Default condition of the machine after power up.

The operator controls propel with the friction held joystick. Ramping and a profile are provided to smooth the transitions from forward to reverse propel. The gate can be opened and closed via the two left buttons on the joystick. The two right push buttons will allow control of the wings up and down. The parking brake needs to be released via a switch on the dash before the machine can propel.

When the operator selects forward or reverse, the brake released coil will be energized before the pump current is activated. Once the operator returns the joystick to neutral, the brake will be set after the handle and pump are in neutral if the Auto brake feature is enabled. If the Auto brake feature is turned off, the park brake will apply on command from the switch. The operator can also control the spread roll, travel mode, and conveyor speed on both left and right sides of the machine from the keypad.

OPERATION



LB002

Figure 6 Chip Spreader Control Panel

OPERATION

Mode Switch

The mode will default to Manual “M” on startup. By pressing the mode switch once the operator can get to Auto “A”. Travel “T” mode will only be activated if the operator holds the Mode switch for 3 seconds and both the hopper is empty and the wings are up.

Conveyers

Auto “A” and Manual “M” modes of operation are available for the left and right conveyers. The mode can be selected via the bottom 2 buttons on the keypad. If the left conveyor is turned on first and then the right conveyor is turned on the right conveyor will automatically go to the same mode as the left conveyor. It is not possible to get one conveyor in Auto and one in Manual. On power up, the conveyers will default to be off. A left- and right-hand conveyor full input will turn off the output to the corresponding conveyor.

Manual Conveyers

With the conveyers in manual mode, the operator will have six speed options available that can be scrolled through using the conveyor speed buttons on the keypad:

Off - No LED's on (default in manual).

Low - LED by L will be on.

Low Medium - LED by L will be on and the LED by M will blink at 2 HZ.

Medium - LED by L will be on and LED by M will be on.

Medium High - LEDs by L and M will be on and the H LED will blink at 2 HZ.

High - All three LEDs will be on.

Auto Conveyers

With the conveyers in Auto, the control will look at FPM (feet per minute) of the machine and an adjustable parameter from the display that will set the max output to the valve in % and control the output accordingly. This will only function if the machine Auto mode is active.

Auto Mode

The operator can select Auto mode from the keypad on the dash. Once the machine is in Auto mode, the control system will control speed and the gate

opening. The operator can set the desired speed (FPM), rock type, size, and PSY (pounds per square yard).

When in Auto mode, the speed control function is always active in the forward direction. If the joystick is at 50% of throw and the set FPM is 100, the machine should travel at 50 FPM. The control system will control output current to the pump using a PID algorithm to reach and maintain the desired ground speed. If the operator moves the joystick back toward center, the machine will slow down proportionally until the joystick is centered. If the operator moves the joystick in reverse, the machine will propel based on the joystick input but the gate will not open and the speed control will be off.

Once ground speed is detected, the gate will open to a minimum value based on the rock type, size, and PSY. As the ground speed is increased, the gate will open. If the combinations of ground speed and operator parameters are not possible, the control system will indicate an application rate error on the screen. Once the gate is active, the spread roll will also be turned on if the SR is turned on from the keypad.

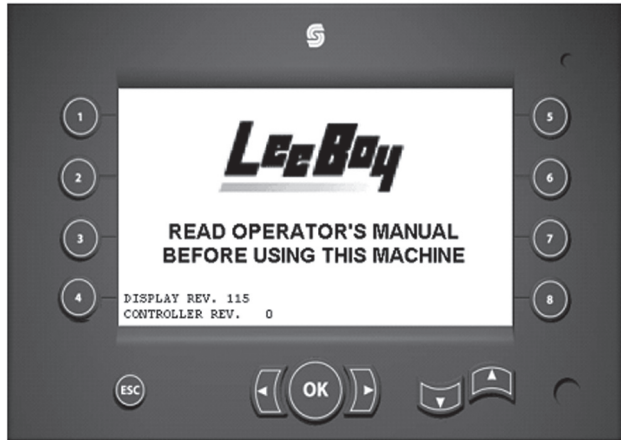
Auto Restart

If the operator is operating in Auto and pulls the joystick to center, the gate will close and the spread roll will turn off. If the Auto Restart function is enabled from the keypad, the control system will keep track of the distance traveled in reverse. When the operator moves forward again, the control system will count down the reverse distance moving forward and, once reached, the system will turn on the spread roll and open the gate. An adjustable offset will be in the service tool to compensate for count error.

OPERATION

DP610 Screens

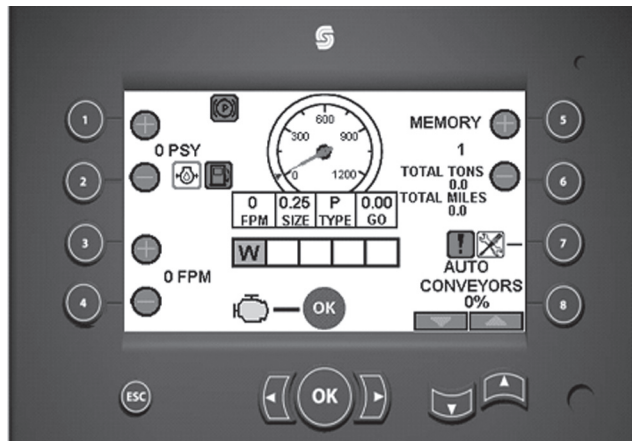
Startup Screen - Displayed for 5 seconds on



LB003

startup.

Main Screen - This screen allows the operator to see current ground speed, PSY setting, current



LB004

memory setting, FPM setting.

When operating in AUTO "A" mode the following operations may be performed:

- Pressing button 1 will increase the PSY (pounds per square yard) rate.
- Pressing button 2 will decrease the PSY (pounds per square yard) rate.
- Pressing button 3 will increase the FPM (feet per minute).
- Pressing button 4 will decrease the FPM (feet per minute).
- Pressing button 5 will move you to the next Memory setting.

- Pressing button 6 will move you to the previous Memory setting.
- Pressing button 7 will take you to the Navigation screen.
- Button 8 has no functions on this screen.
- Pressing the OK button will take you to the Engine screen.
- Pressing the Up/Down arrows will increase or decrease the speed of the conveyors when in Auto mode.
- Pressing "ESC" will always return you to this screen and save updated settings.

The Graphics in the Center have the following function:

- Circle is the actual FPM being traveled shown graphically.
- First square is the actual FPM being traveled shown digitally.
- Second square is the rock size being used.
- Third square is the type of rock ("P" for pit rock and "C" for crushed rock).
- Fourth square is the actual width the rock gate is open.

Second Row of Squares:

- First square is the wing position. Amber color is down and green color is up.
- Second Square will show "HD" when Hopper Dump is activated.
- Third square is the machine mode ("A" Auto, "M" Manual and "T" Travel).
- Fourth square is the left conveyor "CL" clear color for manual mode and green color for Auto mode.
- Fifth square is the right conveyor "CR" clear color for manual mode and green color for Auto mode.

OPERATION

Engine Screen - This screen allows the operator to monitor the following engine parameters:



LB005

- Bottom left is the hydraulic system temperature.
- Top left is the voltage in the system.
- Top middle is the fuel level.
- Center middle is the engine RPM.
- Bottom middle is the engine hours
- Top right is the engine water temperature.
- Bottom Right is the engine oil pressure.

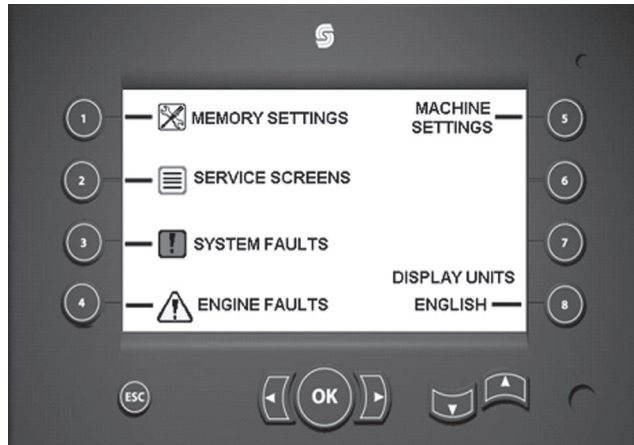
Each of these functions have a digital number value and a graphic display.

By pressing button 1, it will navigate to the System Faults screen. Button 2 will go to the Engine Faults screen. Button 7 will go to the Navigation screen.

All other numbered buttons have no functions on this screen.

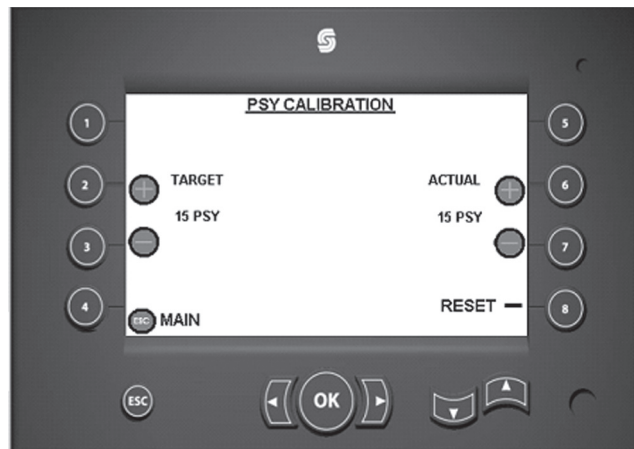
Navigation Screen - On this screen, each button will navigate to the corresponding screen.

Button 8 allows the operator to change the display units from English to Metric.



LB006

Machine Settings Screen - This screen allows the operator to calibrate the PSY.



LB007

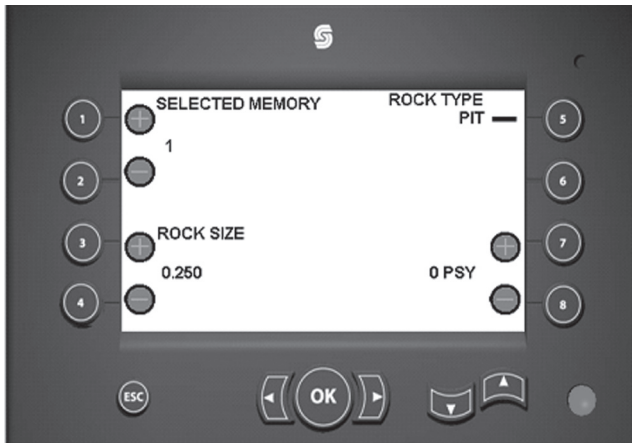
You must first press RESET to get the 1-to-1 Target to Actual. Next, collect 1 sq yd of material and then weigh it. After weighing it, enter that weight using buttons 6 and 7.

Press "ESC" to return to main screen.

OPERATION

Memory Settings Screen - This screen allows the operator to make modifications to any memory setting.

"ESC" will navigate back to the main screen and save selected memory settings.



LB008

Engine Faults Screen - This screen displays the engine faults from the J1939.

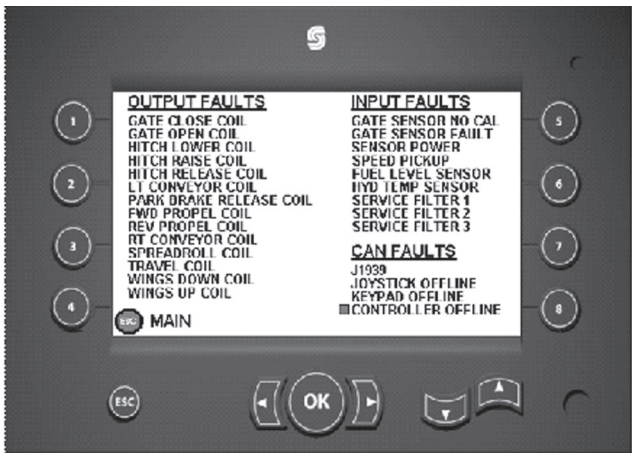
Button 6 allows the operator to toggle between active and inactive engine faults. Buttons 7 and 8 will scroll through the list if there are multiple faults.



LB010

System Faults Screen - A red box next to the name of the fault indicates that the fault is active.

"ESC" will navigate back to the main screen.



LB009

Service Password Screen - This screen allows the operator to access the service screens.

The operator can enter the correct numerical value by using buttons 1 and 2. The operator must then press "OK" to enter the secure screens

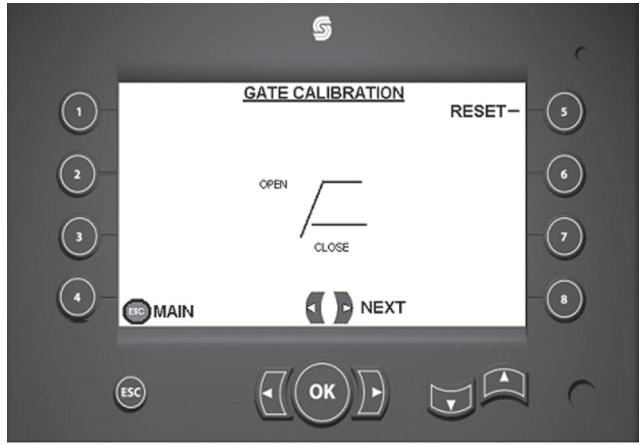


LB011

OPERATION

Gate Calibration Screen - This screen assists the operator in calibrating the gate.

Button 5 will reset the gate calibration. For the calibration routine, refer to the calibration section.



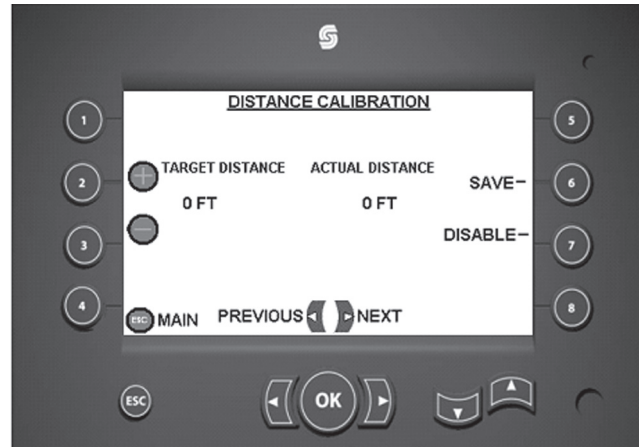
LB012

Gate Sensor Calibration

To calibrate the gate position sensor, the operator must first navigate to the Gate calibration screen. Then close the gate completely and press the RESET button on the display. Wait until the CLOSE text is backlit with green. then open the gate fully. Wait until the OPEN text is backlit with green. The gate position sensor is now calibrated.

If the operator was unable to calibrate the gate positions sensor a technician may need to make an adjustment to the calibration window in the service tool to allow calibration. If the physical gate opening does not match what is on the display, the technician will have to modify the gate profile in the service tool.

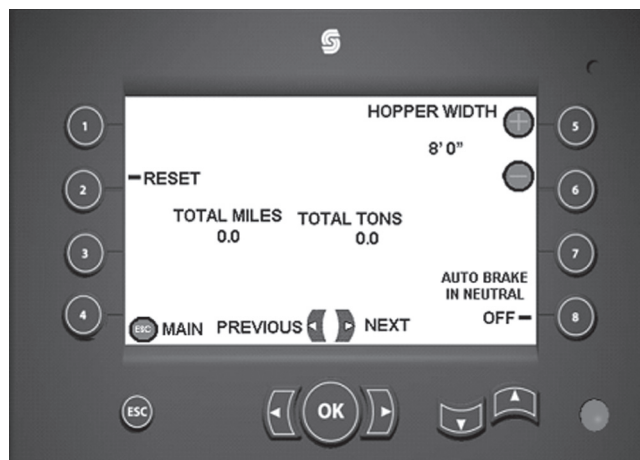
Distance Calibration Screen - This screen allows the operator to calibrate the speed/distance.



LB013

The operator must set the target distance first, then press button 7 to enable the calibration sequence. After they enable calibration, they will begin to drive until they hit their predetermined distance. The operator must press save to save the value. The process is complete.

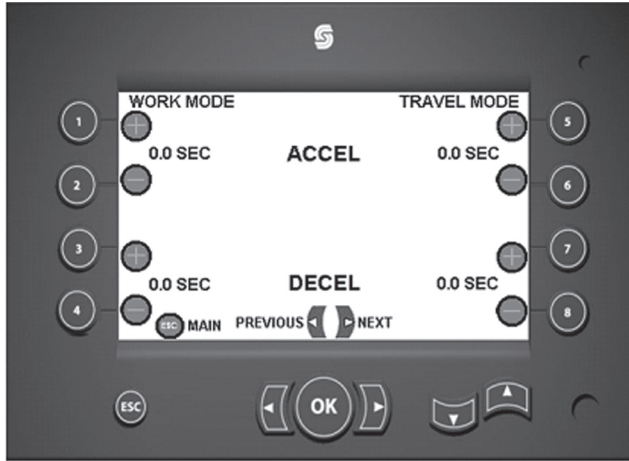
Total Reset/Hopper Width Screen - Button 2 in this screen will allow the operator to reset the total miles and the total tons. Buttons 5 and 6 allow the operator to set the hopper width.



LB014

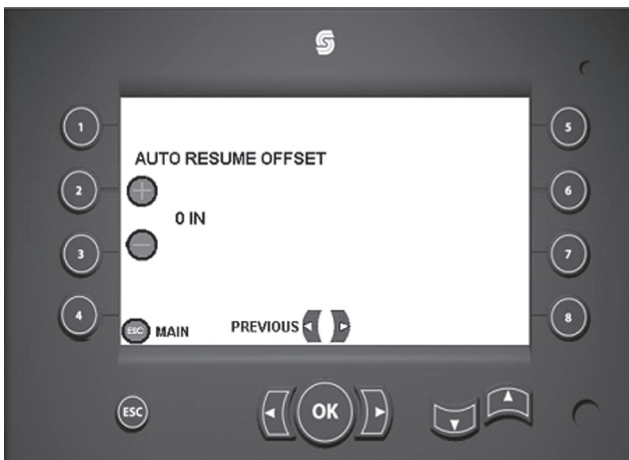
OPERATION

Accel/Decel Calibration Screen - This screen allows the ramp rates to be set for WORK MODE and TRAVEL MODE.



LB015

Auto Resume Offset Screen - This screen allows the operator to adjust any error in the AUTO RESTART mode.



LB016

Keep in mind that for Auto Restart to function correctly, you must always operate your machine at the same FPM. At that feet per minute, if you overshoot your target, press button 3 to the number of inches you overshoot. If you undershoot, press button 2 to the number of inches you undershoot.

Joystick Button Functions

- Button 1 Opens hopper gates
- Button 2 Closes hopper gates
- Button 3 Releases truck hitch
- Button 4 Raises hopper wings
- Button 5 Lowers hopper wings

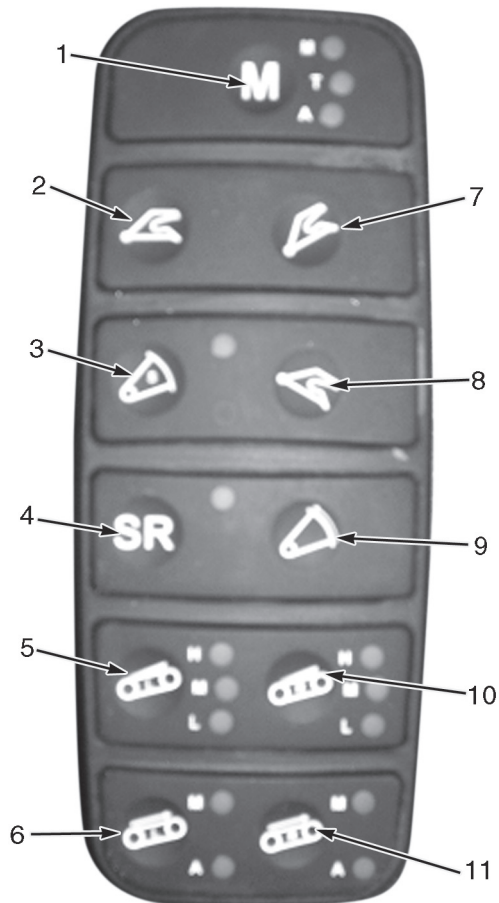


LB017

OPERATION

Key Pad Functions

- Button #1 Push to Select Machine Mode (Manual, Travel or Auto); Note you must have wings up and hold button for 3 seconds to enter the Travel Mode
- Button 2 Push to release truck hitch
- Button 3 Push to activate Auto Restart
- Button 4 Push to turn spread roll ON/OFF
- Button 5 Push to select left conveyor speed in Manual
- Button 6 Push to select left conveyor mode
- Button 7 Push to raise truck hitch
- Button 8 Push to lower truck hitch
- Button 9 Push to activate hopper dump
- Button 10 Push to select right conveyor speed in Manual
- Button 11 Push to select right conveyor mode (Auto or Manual)



LB018

OPERATION

CONVEYOR OPERATION

The conveyor speed may be adjusted to match the spread needs of the machine. The proper conveyor speed is slightly faster than the machine spread requirements. At this speed, the conveyors will run nearly continuously, stopping infrequently to insure the aggregate does not over flow in the hoppers.

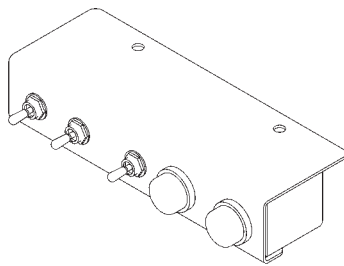


ATTENTION: *The conveyor system can be damaged by setting the conveyor speed too high. This causes the conveyors to start and stop continuously which shocks the system repeatedly.*

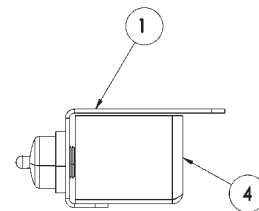
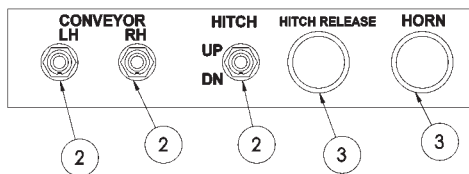
SECOND OPERATOR CONVEYOR CONTROLS

As previously stated, controls for the second operator are located on the right side of the Chipspreader near the spread hopper end of the conveyors. (See Figure 7.)

There are two toggle switches which allow the operator to control each conveyor individually. There also may be an optional push button release to allow the second operator to release the truck hitch. (See figure below.)



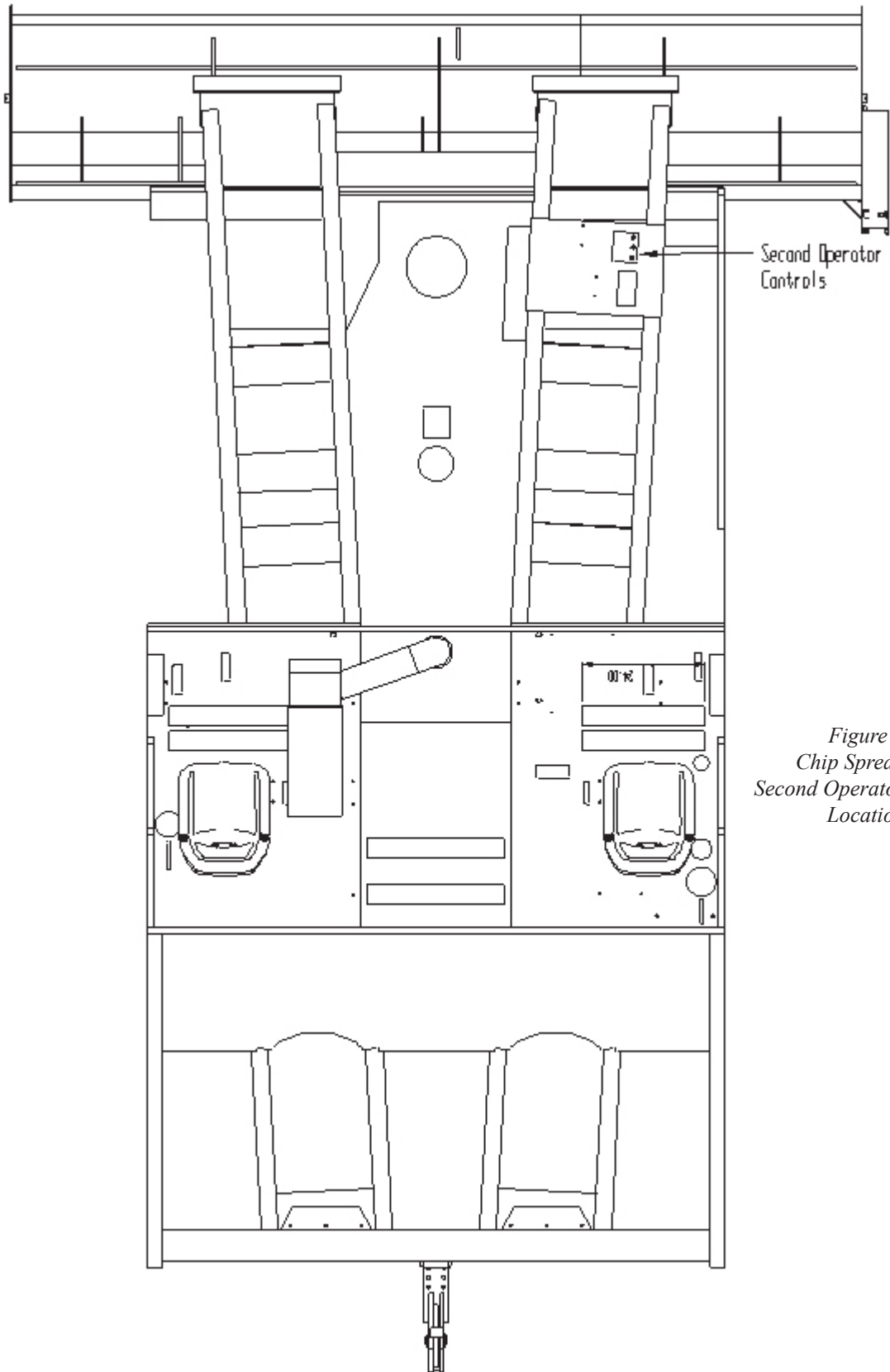
ITEM NO.	PART NUMBER	QTY	UOM	DESCRIPTION
1	1002846	1	EA	SH.REMOTE PANEL,CSHF
2	72884	3	EA	SWITCH,TOGGLE,SPDT,2-POS,MOM
3	982249	2	EA	SWITCH,PUSHBUTTON,MOM
4	1002848	1	EA	SH.COVER,REMOTE PANEL,CSHF



LB019

Second Operator Controls

OPERATION



*Figure 7
Chip Spreader -
Second Operator Control
Location*

OPERATION

PREPARATION FOR USE

The following procedures are necessary to prepare the ROSCO Chipsreader for initial operation. They will also be needed any time one or all of the components are removed for repair, moving or storage.

ATTACHING THE SPREAD HOPPER

See figure 8 for illustrations of each step.



ATTENTION: *To avoid interference with the lifting boom, the gravel deflector adjustment bars must be disconnected while attaching hopper.*



CAUTION: *Verify that lifting equipment is capable of easily lifting and moving the hopper into position. The lifting equipment must have a minimum capacity rating of 2 tons (4000 lbs. or 1815 kg).*

Step D - Make sure the assist chain attached to the **front lifting eye (4)** will not interfere with moving the spread hopper. With tension on the lifting chain, move the lifting vehicle toward the Chipsreader which will tip the hopper back into position. Insert the **locking pins (1)** and rotate to insure the handle is behind the lug welded to the frame. This prevents the pin from moving out.

Attach the hopper drive motor hydraulic hoses and plug in electrical connections.

Step A - Verify that the **locking pins (1)** are removed. Lift the spread hopper using the two **lifting eyes (2)**. While the front of the hopper is tipped slightly forward, engage the lip on the back of the hopper with the **hopper seat (3)** on the Chipsreader frame. An assist chain can be fastened between the **front lifting eye (4)** and the hook to prevent the spread hopper from tipping too far forward.

Step B - Attach assist chain between the **front lifting eye (4)** of the hopper and the front of the Chipsreader. Release tension on the lifting chain.

Step C - Move the lifting chain to the **front lifting eye (4)** of the hopper. Then lift the boom to put tension on the lifting chain.

OPERATION

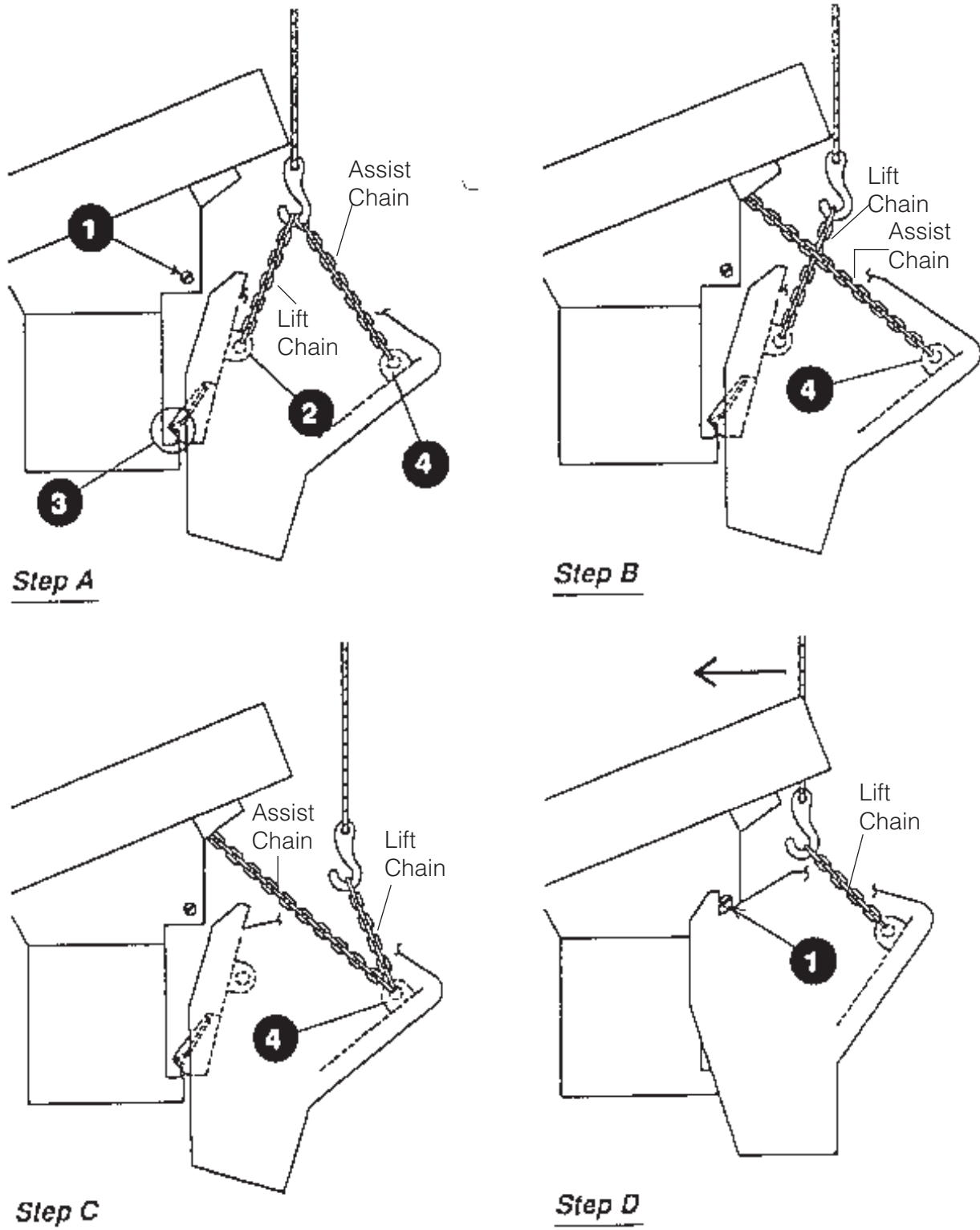


Figure 8
Chip Spreader - Spread Hopper Attachment

OPERATION

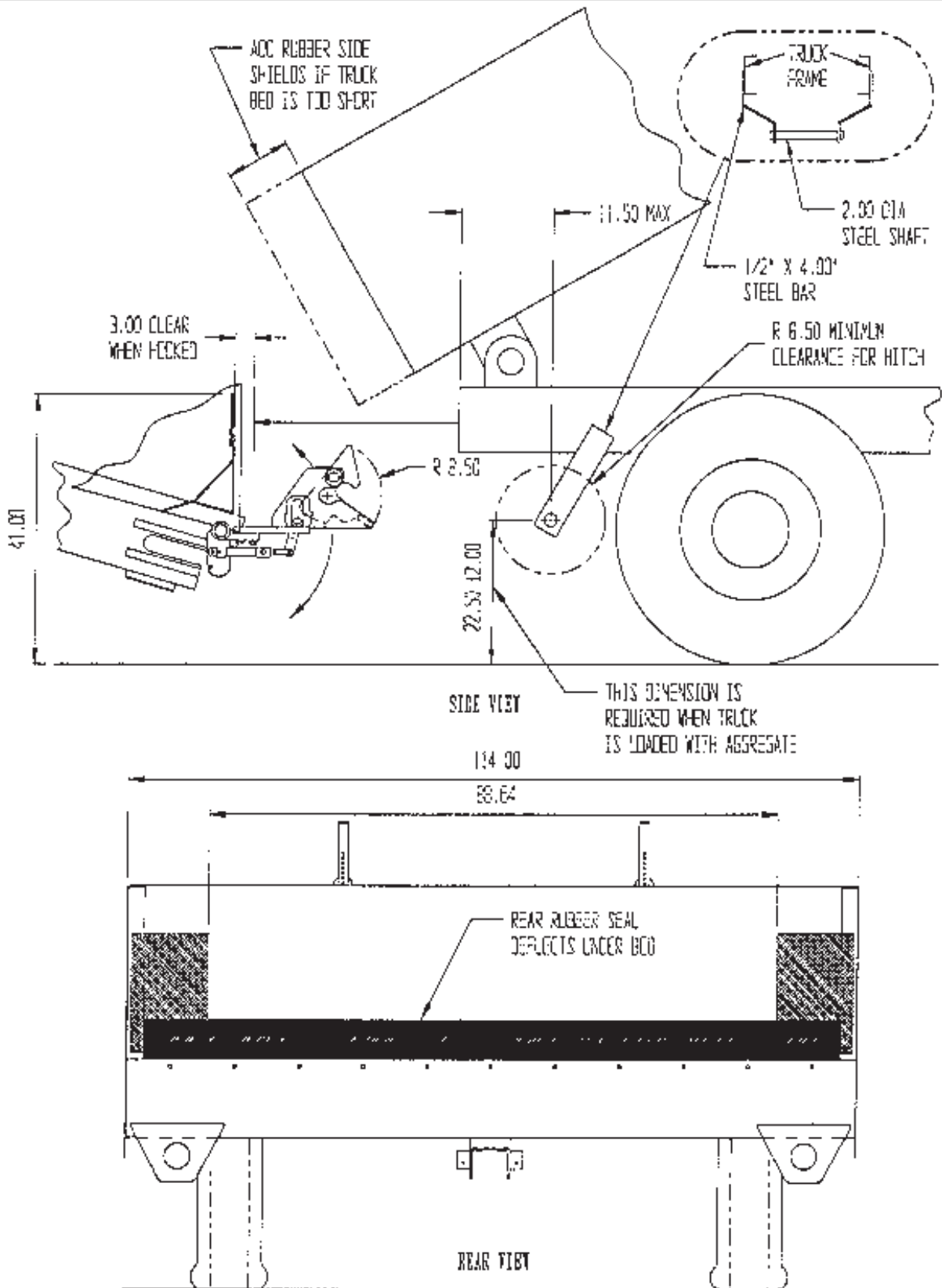


Figure 9
Chip Spreader - Truck Hitch Installation

OPERATION

TRUCK HITCH INSTALLATION

The truck hitch on the Chipsreader is provided to keep the truck close to the receiving (rear) hopper. The success of the entire spreading function is directly related to this hook-up, and care should be taken to insure the accuracy of the hook-up with every truck that will be working with the Chipsreader.

Figure 9 illustrates the relative dimensions of various components and shows the general relationship of the Chipsreader and the truck when they are hooked together. This information should be used to determine where on the truck to mount the pull bar so that a good hook-up can be achieved.

Note: The height of the pull bar is shown with the truck loaded. As all trucks are different, it is impossible for ROSCO to manufacture pull bar components as stock items to send with the Chipsreader.

In general, the tailgate of the truck bed must be set 8"(203.2 mm) inside of the retaining rubber skirt of the Chipsreader when the bed is raised. Frame lengths vary, the overhang of the dump bed on the frame varies, and the relationship of the rear wheels to the frame varies among trucks. Therefore, a check of each truck bed in relation to the Chipsreader receiving hopper must be made.

On large, tandem axle trucks, the frame, rear wheels and often the gate of the dump bed are on the same vertical line. In such cases, it will be necessary to install extensions to the truck bed to insure a proper seal when in the dumping position. When these conditions arise, hitches should be installed/located to allow a minimum of 2 to 2½ inches (50.8 to 63.5 mm) clearance between the rear truck tire and the bumper member of the Chipsreader.

POSITIONING THE CONTROL PANEL

The control panel and steering wheel are designed to be positioned from either the left or right side of the Chipsreader. To position from either the right or left side, follow these steps:

1. To move the control panel, pull the pin handle on the control panel boom and rotate to lock up.
2. While rotating the boom, guide the control panel into position.
3. When positioned, release the boom pin handle and verify that it has engaged the hole.
4. To position the steering wheel, pull the spring pin on the steering wheel arm and rotate the steering wheel to the desired position and release the pin. Verify that it is engaged in the hole.

OPERATION

PRE-START INSTRUCTIONS

Prior to using the ROSCO Chipspreader, the operator should familiarize himself with **all the features and controls** of the Chipspreader as described in the "*Functional Description*". Also, it is important to become familiar with the safety considerations found in the Safety Section of this manual.

PROCEDURES

To assure proper performance, the following daily inspection should be performed before putting the Chipspreader into operation. Consult the Maintenance Section of this manual for details of these procedures.

1. Check all fluid levels as detailed in the Maintenance Section of this manual including the following:

- ☞ Check engine crankcase oil. Add if low.

Do not overfill.

- ☞ Check hydraulic oil reservoir. Add if low.

- ☞ Check engine diesel fuel tank. Add if low.

- ☞ Check engine coolant level at the radiator.

Fill if low.

2. Drain the engine fuel/water separator on the fuel filter.
3. Check the engine air filter restriction indicator. Clean or replace filter element(s) if indicator shows red or above 35 Hg.
4. Check tire pressure. Maintain even pressure in all tires.
5. Check Chipspreader for loose bolts or signs of leaking hoses. Refer to the Maintenance Section for leak inspection procedures.



ATTENTION: *Know the location and function of the controls **before** starting the engine. Refer to diagrams in this section for the position of all operating controls and system monitoring gauges.*

OPERATION

OPERATING INSTRUCTIONS

The ROSCO Chipspreader is ready for operation after all procedures of the "*Preparation for Use*" and "*Pre-start Instruction*" sections have been performed.

ENGINE START-UP

In the following procedures, item numbers listed in parenthesis () refer to Figure 10 which illustrates the location of the operator controls on the control dash panel.

1. To obtain the desired spreading width, engage the required spread hopper gate handles by moving them to the right as you face the hopper.

DANGER: *Never walk in front of the unit to operate the gates while spreading operation is being performed or while unit is in motion. Should a person fall while walking in front of the unit during operation, the operator would not be able to see or hear them and serious injury or death would occur.*



2. Mount the driver's station, fasten the seat belt and become familiar with the location of all controls.



CAUTION: *Wear the provided seat belt when operating the Chipspreader.*

3. Verify that the **conveyor control (3)** and the **spreadroll switches (3)** are in the OFF position. (Refer to Key Pad Functions, earlier in this Section.)
4. Place the **joystick (2)** in the NEUTRAL position.
5. Turn the **park brake switch (7)** to the ON position.
6. Set the engine throttle to ½ speed.

7. Turn the **ignition switch key (4)** to activate the engine starter. As soon as the engine starts, release the switch. If the weather is cold, see "*Cold Weather Starting*" instructions later in this section.



ATTENTION: *Do not crank the engine for more than 30 seconds at a time. Starter failure may result from continuous cranking.*

Note: If the starter doesn't turn the engine over, shut off the ignition key immediately and make no further attempts to start the engine until the condition is corrected. Refer to the Trouble Shooting Section in this manual (or the **CAT Diesel Engine manual**) for possible solutions. For further trouble analysis, contact your CAT Diesel Engine Service Dealer.



ATTENTION: *Allow the starter to cool down for 2 minutes between unsuccessful attempts to start the engine. Failure to follow these guidelines may result in burning out the starter motor.*

8. Move the engine throttle to "*IDLE*" position as soon as the engine starts.

9. Check the various gauges on the control panel for proper readings and investigate if any mode is not functioning properly.



ATTENTION: *Be sure oil pressure is observed within 15 seconds after starting the engine. If no oil pressure is shown on the gauge in 15 seconds, shut down the engine and determine the cause.*

OPERATION

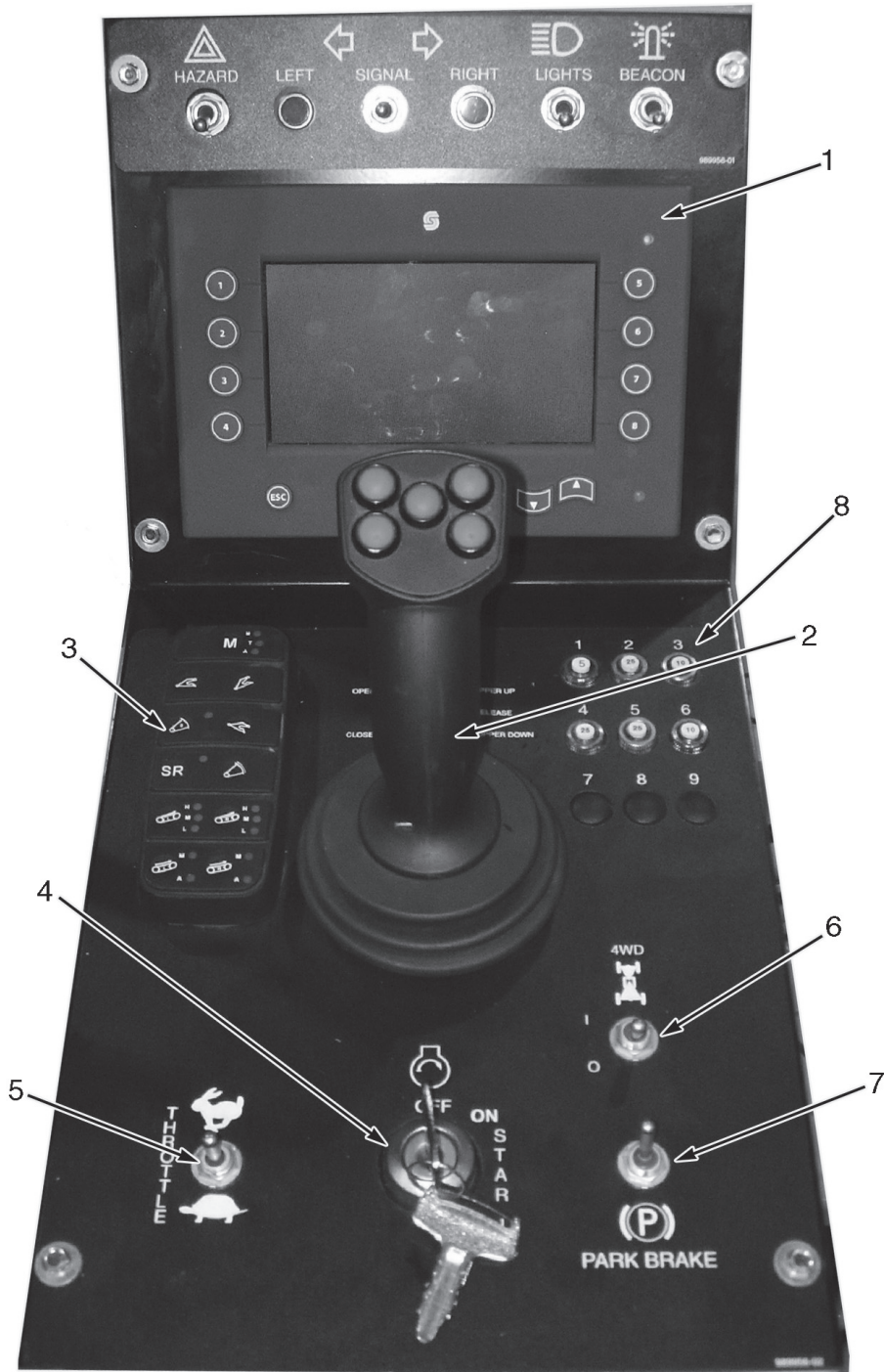


Figure 10
Chip Spreader
Control Panel

LB002

OPERATION

ATTENTION: *Avoid idling the engine for more than 10 minutes. Long periods of idling can be harmful to your engine because combustion chamber temperatures can drop so low that the fuel may not burn completely. Unburned fuel will dilute the crankcase oil, reducing its viscosity and ability to protect the engine.*



COLD WEATHER STARTING

The direct-injected CAT Diesel Engine starts well in cold weather. If it is necessary to use ether as a starting aid, do it promptly. Read and follow the steps below and on the ether manufacturer's recommendations for safe and effective use.

1. Place unit in NEUTRAL and set the parking brake.
2. Set throttle to IDLE.
3. Have another person crank the engine while you spray starting fluid into the air cleaner for no more than two (2) seconds at a time.



ATTENTION: *NEVER remove the air filter element and spray ether directly into the air inlet piping or the intake manifold.*

4. Be sure that engine oil pressure is indicated on the gauge within 30 seconds after starting.



DANGER: *Never use ether near open flames or with pre-heater or glow-plugs. The combination can cause an explosion.*



WARNING: *Do not inhale ether fumes, as they are harmful.*



ATTENTION: *Do not use excessive amounts (spray for more than two (2) seconds per time) of ether starting fluid when starting the engine. The use of too much ether will cause engine damage.*

If the unit is equipped with an Automatic Ether Injection system, follow the described steps for starting in cold weather.

1. Put the unit in NEUTRAL and set the parking brake.
2. Set throttle at IDLE.
3. While cranking the engine, inject a metered amount of ether by pushing the Ether Injection Button on the control panel.
4. Be sure the engine oil pressure is indicated on the gauge within 30 seconds after starting.
5. Never inject ether for more than 2 seconds at a time.

DANGER: *Never walk in front of the unit to operate the gates while spreading operation is being performed or while unit is in motion.*



Should a person fall while walking in front of the unit during operation, the operator would not be able to see or hear them and serious injury or death would occur.

ELECTROMOTIVE RADIATION INTERFERENCE

High Electromotive Radiation (EMR) produced by citizen band radios and other sources can interfere with the function of the on-board computer. EMR causes stray voltages to be induced in the signals to and from the computer. As a result, the machine could unexpectedly speed up and/or the application rate could suddenly change.



WARNING: *The machine should be tested at a remote site if EMR is present to insure that there are no abrupt movements or extreme levels of application.*

OPERATION

Possible solutions for problems caused by EMR include:

1. Remove the source of the radiation.
2. Move the source of the radiation away from the computer area.
3. Shield the computer and/or the wiring in metal enclosures, particularly the power lead going to the computer.

OPERATION ON STEEP GRADES

Operation on hills with a 10% or higher grade requires special techniques to avoid wheels slipping when accelerating up slope or stopping down slope.



CAUTION: *Operation on steep grades can cause death or serious injury due to jackknifing and unit runaways. Review this section carefully and do not operate on grades with poor surfaces and deep ditches.*

Wheel slippage causes mat marking as well. Usually only one wheel slips during acceleration and climbing on steep grades, but both wheels may slip on stopping. The most common cause is the tractive effort of the tires exceeding the friction of the tires to the road surface.

The ROSCO Chipspreader's hydraulic system eliminates the possibility of wheel slippage when the machine is fully loaded with aggregate. The multi-function valves on the wheel motor drive pumps are set to limit the pressure that creates the traction effort. For most applications the forward pressure is set at 4500 psi and the reverse pressure to 2900 psi. However, the settings will depend on the friction created by the material being spread.

You may vary these settings slightly so the machine will pull up the steepest possible grade without

slipping. Caution must be used to avoid excessively increasing the pressure settings to pull up steep grades. A slight increase in pressure above the optimum will cause the wheels to mark the mat during start up on level ground and when climbing steep grades.

When the Chipspreader is operated on a slope steeper than it can climb, the pumps hold a constant maximum pressure but will not put out any flow. The machine stops moving and the engine unloads.

Wheel slippage can also be eliminated by one or more of the following techniques:

- 1) The operator can increase the weight on the driving axle by filling the rear hopper to maximum capacity prior to take-off and during stopping.
- 2) When stopping on steep down-hill grades (10% or more) the truck driver can assist the operator by lightly applying the truck brakes.

When climbing steep grades the truck operator may shift into reverse and push lightly. On some grades the Chipspreader can operate alone, spreading the rock contained on the unit. On long, steep grades, the chipping operation may be performed down hill, taking all necessary precautions to prevent jackknifing and run aways.



ATTENTION: *Increasing the pressure on the multi-function valves of the wheel motor drive pumps can cause the wheels to slip or skid, marking the mat. The pressures must be set so the wheels will not spin, but will create maximum pull.*

OPERATION

NOTES

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MAINTENANCE

The recommendations contained in this manual for maintenance should be followed to obtain long life and best performance from the ROSCO Hydrostatic Chipsreader.

PROPERLY MAINTAINED EQUIPMENT IS SAFE EQUIPMENT! The user of this product is responsible for inspecting the Chipsreader daily and for having parts replaced or repaired when continued use of the machine would cause damage or excessive wear to other parts. General daily inspection of the Chipsreader should include observation for loose bolts, fluid leaks, worn or damaged hoses, debris or dirt accumulations which could cause a potential service or safety problem.

PREVENTIVE MAINTENANCE CHART. A preventive maintenance chart is included at the end of this section as a guide to assist the user in establishing a preventive maintenance schedule for the Chipsreader.

KEEP YOUR MACHINE CLEAN! The first and most important requirement for satisfactory Hydrostatic Chipsreader performance is a clean machine. Many failures in the field are due to equipment that has been allowed to become so covered with an excess amount of gravel and dirt that even ordinary adjustments and lubrication are neglected.

----- **ENGINE MAINTENANCE** -----

In addition to the following recommendations for engine maintenance, consult the Cummins Diesel Engine Manufacturer's Operation and Maintenance Manual. A copy of this manual was provided with the Chipsreader at the time of its shipment from the factory. If additional copies are needed, they can be obtained from an authorized ROSCO dealer/distributor or through a local equipment dealer who sells or services the particular engine make that your Chipsreader is equipped with.

FUEL

In general, use clean, good quality ASTM No. 2-0 or No.2-D climatized diesel fuel. If the Chipsreader will be used often in cold weather (below 20° F or -6° C), blended fuels or #1 diesel fuel is recommended. However, the engine performance will be lessened by approximately 10%.

The direct-injected CAT Diesel Engine starts well in cold weather. If it is necessary to use ether as a starting aid, see "*Cold Weather Starting*" in the Operation Chapter of this manual.

ATTENTION: *Avoid using contaminated fuel. Fuel contaminated by water or dirt can cause severe damage to engine components. Fuel tanks contaminated with water will promote the growth of "microbes" which will form a "slime" that clogs fuel filters and lines.*



FUEL FILTER

Diesel engine injection systems use fuel for lubrication of close tolerance internal engine parts. Therefore, proper maintenance of the fuel filters and the fuel tank are required to insure top performance and to prevent damage to internal engine components.

The engine fuel filter and water separator are located on the left side of the engine. A drain valve is provided on the bottom of the water separator. See Figure 1.

1. Before operating the engine, use the valve to drain a small quantity of fuel from the water separator into a clean, clear container. This is an absolutely necessary daily routine.
2. If water or contaminants are found in the fuel you drained, DO NOT attempt to start the engine. Continue to drain fuel into the container until it runs clear.

MAINTENANCE

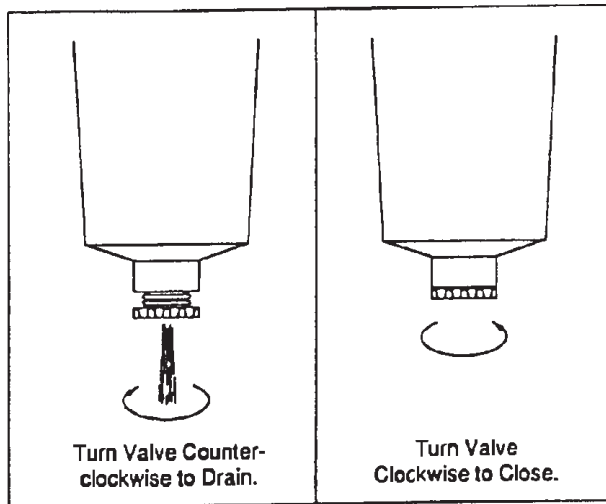


Figure 1

3. If large amounts of contamination are found, drain the fuel tank until the lines run clear. Then, replace the filters, fill the new filters with fresh clean fuel and install.

The CAT diesel engine manual provided with your Chipspreader contains more detailed information on fuel system maintenance procedures.

CRANKCASE OIL

CAUTION: *Prolonged and repeated skin contact with used engine oils should be avoided. Such contact may cause skin disorders or other bodily injury.*



The engine crankcase oil level should be checked daily prior or each day's use of the Chipspreader. The Chipspreader must be parked on a level surface when checking the oil to assure accurate measurements.

When checking the oil level, wait until the engine has been turned off for at least five minutes. This allows the oil to drain back to the crankcase.

The oil dipstick is located on the left side of the engine. If the oil measures below the "L" mark on the dipstick, add the proper oil according to the Preventive Maintenance Chart found at the end of this chapter. After adding oil, recheck the level

with the dipstick and make sure it doesn't measure above the "H" mark.

ATTENTION: *Never operate the engine with the oil level below the "L" (low) mark or above the "H" (high) mark.*



Change the engine crankcase oil and filter element(s) after every 250 hours or 3 months of service.

Refer to the Preventive Maintenance Chart and/or engine manufacturer's manual for engine oil recommendations.

CAUTION: *Hot oil can cause personal injury.*



AIR INTAKE SYSTEM

Turbocharger engines are especially demanding of air filter performance, and sensitive to filter failure. The operator should be continually aware of the condition of air intake system components.

The heavy-duty engine air cleaner is mounted on top of the engine sound shield between the conveyors. A restriction indicator is mounted on the outlet side of the air cleaner assembly housing, near the large inlet tube to the engine.

When inspecting the air intake system components, follow these guidelines:

1. Prior to daily operation, inspect all air intake system components for damage, cracked hoses, loose clamps, etc.
2. Inspect the restriction indicator several times daily during operation. If the red indicator is visible, the air cleaner element must be replaced.



ATTENTION: *Be sure to clean the inside of the air cleaner body assembly BEFORE removing the safety element.*

MAINTENANCE

a. Before replacing any new element into the air filter housing, wipe the inside of the housing with a damp cloth. Replace the element and then reset the restriction indicator. ***Be sure not to introduce any contaminants into the engine intake tube.***

b. When replacing body assembly or rubber adaptors, torque the T-clamp to 50 inch pounds.

3. DO NOT replace the filter elements until the restriction indicator shows red or the maintenance interval has been reached.

4. Replace the primary filter element every 100 service hours. Replace the safety element during every third replacement of the primary element. Refer to the Preventive Maintenance Chart in this manual for the correct ROSCO part number.

5. The air inlet hood should not require maintenance or service unless visual damage is noticed.



ATTENTION: *Never operate the engine without an air cleaner. Destruction of internal engine components will occur in minutes.*

RADIATOR AND COOLANT



CAUTION: *Prolonged and repeated skin contact with used antifreeze should be avoided. Such contact may cause skin disorders or other bodily injury. Wash thoroughly after contact. Keep out of reach of children.*

Check the engine radiator daily for rocks and/or debris. A partially blocked radiator will significantly reduce the efficiency of the radiator and could cause overheating and possible premature failure of the engine or its components.

Compressed air can be used to remove rocks or debris from the radiator.



CAUTION: *Wear eye protection when using compressed air. Flying debris can cause serious eye injury.*

Check radiator coolant level prior to each day's use of the Chipsreader (when engine is cold). The coolant level, when the engine is cold, should cover the radiator core. If low, fill with a 50% water and 50% ethylene-glycol type antifreeze.



WARNING: *DO NOT remove the radiator cap when the engine is hot. Escaping coolant can cause serious burns. Add coolant only when engine is stopped and fully cooled.*

Seasonally, or after every 500 service hours, most engine manufacturers recommend that the cooling system be flushed. Consult the engine manufacturer's manual for recommendations on the procedure and type of cleaner to use.

As an option, a coolant conditioner/filter assembly may be provided and mounted on the right side of the engine. This assembly has two isolation/shut-off valves for easy replacement of the spin-on element. This element should be replaced every 500 hours or 6 months of service.

If the engine is equipped with an optional low coolant level switch/gauge, and the coolant level is OK, visually verify that the gauge pointer is in the "SAFE" range. The low coolant level alarm can be tested with the engine running by twisting the black knob on the switch/gauge counterclockwise until the pointer makes contact with the bottom terminal stop. The system warning light on the driver's control panel should activate.

BATTERY MAINTENANCE

The Chipsreader is equipped with two batteries that provide efficient starting of the diesel engine. Proper maintenance of these batteries will provide years of trouble free service.



WARNING: *Always wear eye protection when servicing batteries.*

MAINTENANCE

Starting the engine depends heavily on good cranking speed. It is important that the Chipsreader battery always be fully charged and that all terminals are cleaned and properly connected.

Check the level of the battery electrolyte (water) bimonthly. Add distilled water if necessary, but do not overfill. Overfilling can cause poor performance. "Maintenance-free" type batteries rarely require additional electrolyte.

Keep the top of the battery clean. When necessary, wash with a solution of 1 part baking soda and 4 parts water and then rinse with fresh water. Do not allow solution to enter the battery cells.

CAUTION: Always disconnect battery ground (-) cables first and always reconnect the positive(+) cables first when servicing battery cables and when removing and replacing a battery. Remove the ground (-) cables when welding on the machine.



Inspect the cables, clamps and hold-down brackets regularly. Clean and apply a light coating of grease when needed. Replace corroded, damaged parts if necessary.

If the engine is difficult to start or the batteries become discharged repeatedly, clean the terminal connections. If the problem continues, test the battery with a battery tester for voltage and current draw.

DANGER: Explosive gases may remain around a battery several hours after it has been charged. Sparks or flame can ignite these fumes causing an explosion which could shatter the battery and cause severe personal injury. Always shut off the battery charger before disconnecting cables from the battery terminals.



If the Chipsreader is to be stored for more than 30 days, remove the batteries and store them in a cool, dry place. During storage, keep the batteries

fully charged and check the level of the electrolyte prior to charging and storing.

ENGINE BELT MAINTENANCE

Check the primary diesel engine belt for excessive wear, fraying and cracking every 250 service hours. Auxiliary V-drive belts should be inspected every 100 hours.

Adjust engine belts as required to provide proper tension. Consult the Cummins Engine manufacturer's manual for correct tension instructions and specifications.



DANGER: Always shut down the engine before adjusting belts. Severe injury can result if belts are adjusted on a running engine.

When installing new belts, always shorten the distance between pulley centers so the belt can be installed without force. Never roll the belt over the pulley and never pry it with a tool such as a screwdriver. This will damage the belts and cause early failure.



DANGER: Keep all belt guards in place. Severe personal injury may result from contact with turning belts and pulleys.

MAINTENANCE

The ROSCO Chipsreader's hydraulic system is composed of two major component groups- the Hydrostatic Drive group and the Auxiliary Hydraulic group.

The Hydrostatic Drive group consists of:

- ⇒ one axial piston hydrostatic pump direct-coupled to the rear of the diesel engine.
- ⇒ one high-torque hydraulic motor driving a planetary front axle.
- ⇒ (4 WD only) two high-torque hydraulic motors that drive two planetary torque hubs.

The Auxiliary Hydraulic group consists of:

- ⇒ a single load-sense pump, directly mounted on the rear of the drive pump.

Independent circuits are provided for:

- ⇒ left-hand conveyor drive to hydraulic motor at conveyor.
- ⇒ right-hand conveyor drive to hydraulic motor at conveyor.
- ⇒ hopper spreadroll and agitator to hydraulic motor on hopper.
- ⇒ steering system, power brakes, and gate control.

Included in the Chipsreader's hydraulic system are solenoid valves, flow control valves and dividers and other components that allow for simultaneous function and control of all hydraulic sub-systems. A 50 gallon hydraulic reservoir with suction strainers, charge pressure and return filters stores and cleans the hydraulic fluid. An oil cooler is mounted in front of the engine radiator to complete the hydraulic system.

This manual contains general system maintenance guidelines. More detailed service and maintenance information is available directly from the hydraulic component manufacturers if necessary or desired.

HYDRAULIC SYSTEM MAINTENANCE

HYDRAULIC FLUID

Refer to the Hydraulic Fluids chart at the end of this section. When adding or changing hydraulic system fluid, be sure to use an equivalent grade of hydraulic fluid.

The use of hydraulic oils or fluids that DO NOT have equal characteristics to the recommended fluid could result in substandard performance or even possible failures of the hydrostatic system components.

If you are not sure whether a specific hydraulic fluid is suitable for use with the Chipsreader, consult your authorized ROSCO Dealer or the ROSCO factory service department.

HYDRAULIC RESERVOIR

The hydraulic reservoir is located below the operator's seat on the left side of the Chipsreader. The fill cap is located behind the operator's seat on the left side of the unit.



ATTENTION: Use extreme caution when removing the filler cap to prevent foreign matter from entering the hydraulic reservoir. Clean around the reservoir cap before removal.

A sight gauge is provided on the side of the reservoir to monitor the fluid level. See Figure 3 for location of sight gauge and for other component items in the following descriptions shown in () parenthesis.

MAINTENANCE

When inspecting the hydraulic reservoir, follow these guidelines:

1. Check the level of the hydraulic fluid prior to each day's operation of the Chipspreader. Hydraulic fluid should be visible at least half way up the glass in the **sight gauge (2)**. If not, fill to this level with an approved hydraulic fluid. (See Hydraulic Fluid Chart in this chapter).

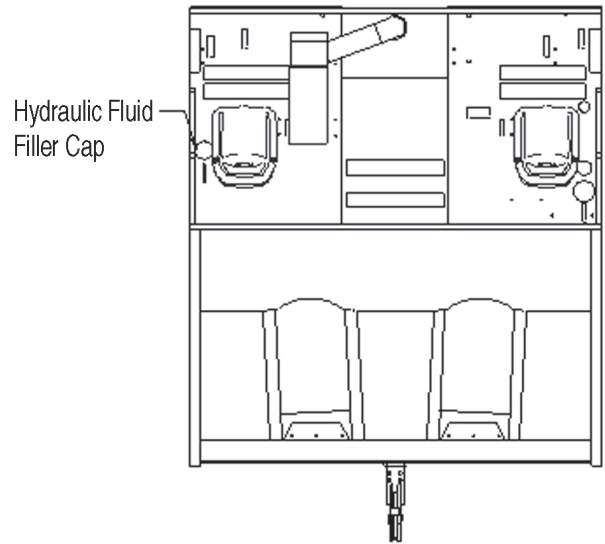
2. The reservoir **fill cap strainer (7)** should be cleaned each time hydraulic fluid is added or changed. Remove strainer and back flush.

3. The **filler cap (6)** should be padlocked in place when practical to eliminate the possibility of tampering.

4. Condensation that may build up in the hydraulic system is capable of clogging the filter elements. This condition can lead to insufficient hydraulic fluid at the pump, which will in turn degrade the performance of and possibly damage the hydrostatic pump or other system components. Therefore, check the indicators periodically.

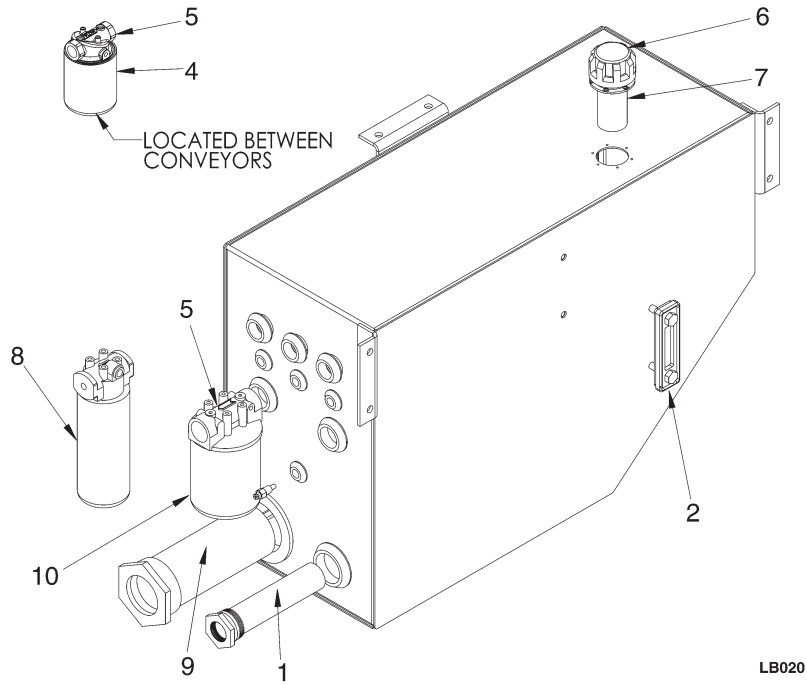
5. To Check the indicators on the hydraulic system, warm the system to above 100°F (38°C) and be sure the engine is at full throttle. Check **return filter indicators (5)**. If any indicators are in the "RED" area, replace the **filter element(s) (10) or (4)**.

Note: The filter element(s) should be replaced using only genuine ROSCO replacement parts.



*Figure 2
Chip Spreader - Top View*

MAINTENANCE



*Figure 3
Hydraulic Reservoir and Sight Glass Location*

MAINTENANCE

FILTER ELEMENTS

For filter element change intervals, refer to the Preventive Maintenance Chart at the end of this chapter. In the following paragraphs, the numbers in parenthesis () refer to items in Figure 4.

Return Filters (10 and 4) - There is one filter located on the left side of the hydraulic reservoir and one located between the conveyors on the right side under the access cover on the deck. These are spin-on type filter elements.

Charge Pressure Filters (8) - There is one filter located to the left of the hydraulic reservoir, behind the steps. This is also a spin-on type filter element.

Suction Strainers, 100 GPM (9) - The 100 GPM Strainer is located to the left of the hydraulic reservoir, behind the steps. This services the pump for the Load-sense system circuits. Refer to the Preventive Maintenance Chart for service intervals.

Suction Strainers, 25 GPM (1) - The 25 GPM Strainer is located to the right of the 1000 GPM strainer. They should be serviced per the maintenance chart schedule.

HYDRAULIC SYSTEM CHECKS

Before each day's use, inspect the Chipspreader for hydraulic leaks. A weekly check should be performed to make sure that all fittings are secure and tight.



DANGER: Always wear eye protection when inspecting for leaks in the hydraulic system.



DANGER: Never use your hand to locate hydraulic leaks. Hydraulic fluid under pressure will pierce the skin and may cause serious infection or toxic reaction. If hydraulic fluid has pierced the skin, get immediate medical attention.

If leaking fluid is found, it is probably on the pressure side of the hydraulic system. Find and repair the leaking component before starting the Chipspreader.

Leaks on the suction side of the hydraulic system are more difficult to find. Some symptoms of suction side leakage are:

- ⇒ Foaming of hydraulic fluid.
- ⇒ Sluggish system operation.
- ⇒ Unusual noises in hydraulic pumps/motors.

Leaking on the suction side of the system is serious, since air or dirt introduced into the hydraulic system causes rapid component wear and eventual failure.

To isolate a suction side leak:

1. Verify that all reservoir valves are fully open and all connectors are properly tightened.
2. If the problem persists, wrap the suction side hose and the connectors with a high-quality electrical tape. Start at the pump inlet and work towards the hydraulic reservoir.
3. If this technique isolates the leak, replace the defective hose assembly or fitting. Never attempt to repair hydraulic hoses and/or leave the tape attached.



DANGER: Never attempt makeshift repairs using tape, clamps or cements. The system operates under extremely high pressure and such repairs could fail, causing serious injury.

An operator should stop and inspect the Chipspreader occasionally for leaks during operation. Some hydraulic leaks may only be noticeable while the unit is running.

MAINTENANCE

PUMPS AND MOTORS

The hydraulic pumps and motors generally require no regularly scheduled maintenance. As stated, frequent inspection for leaks will indicate the need for possible service of these components. If a problem develops with a pump or motor, contact your ROSCO dealer before making any repairs to avoid warranty problems. Any repairs that are made must be in accordance with the pump or motor manuals supplied with the unit.

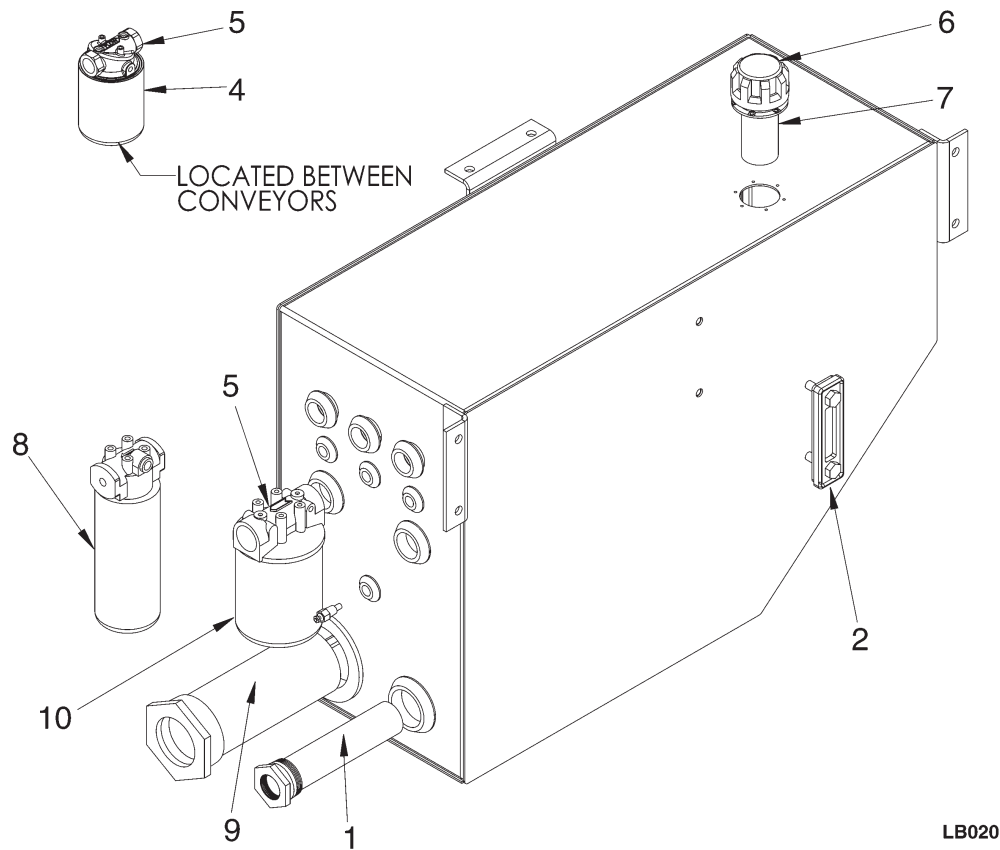


Figure 4
Hydraulic Reservoir

MAINTENANCE

AGGREGATE DELIVERY SYSTEM MAINTENANCE

Components of the aggregate delivery system are identified in Figures 5, and 6. In the following paragraphs, unless another figure is referenced, the numbers in parenthesis () refer to these figures.

BELT WIPERS

The **conveyor belt wipers (21)** are mounted immediately below the conveyor head pulleys and contact the conveyor belt. They serve to remove any material sticking to the belt as it changes direction and heads back towards the receiving hopper.

Periodically check for clearance between the **conveyor belt wipers (21)** and the **conveyor belts (10)**.

To adjust the **conveyor belt wipers (21)**, loosen the channel strip bolts on the wiper and move the wiper to firmly touch the **conveyor belt (10)**.

If a **conveyor belt wiper (21)** shows excessive wear, replace it with a genuine ROSCO part (see Parts Catalog).

ATTENTION: Use genuine ROSCO parts for replacement of rubber conveyor components. Using hard rubber, old conveyor belting, or any other rubber containing fabric or reinforcement, will cause rapid conveyor belt wear and eventual failure.



CONVEYOR CHUTE LINER

The sections of **rubber chute liner (9)** on each side of each **conveyor belt (10)** are designed to prevent aggregate material from leaving the conveyors. They should be adjusted to touch the **conveyor belts (10)** evenly along the entire length of the belts.

Periodically check for clearance between the **chute liners (9)** and the **conveyor belts (10)**.

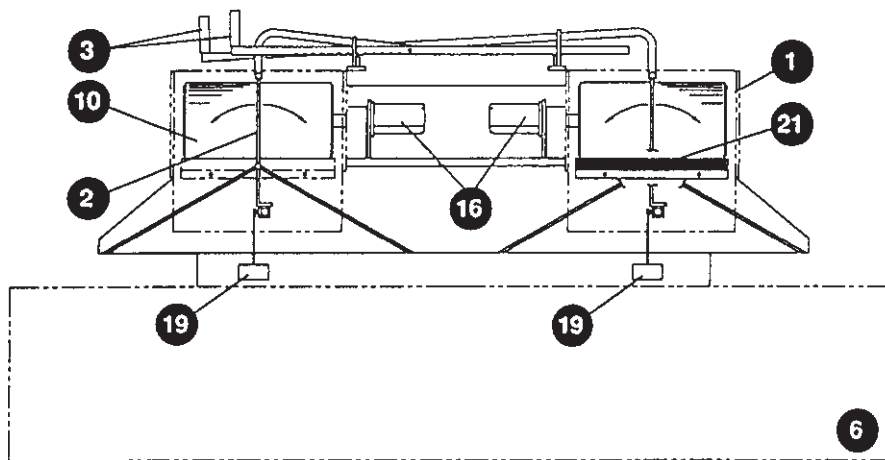
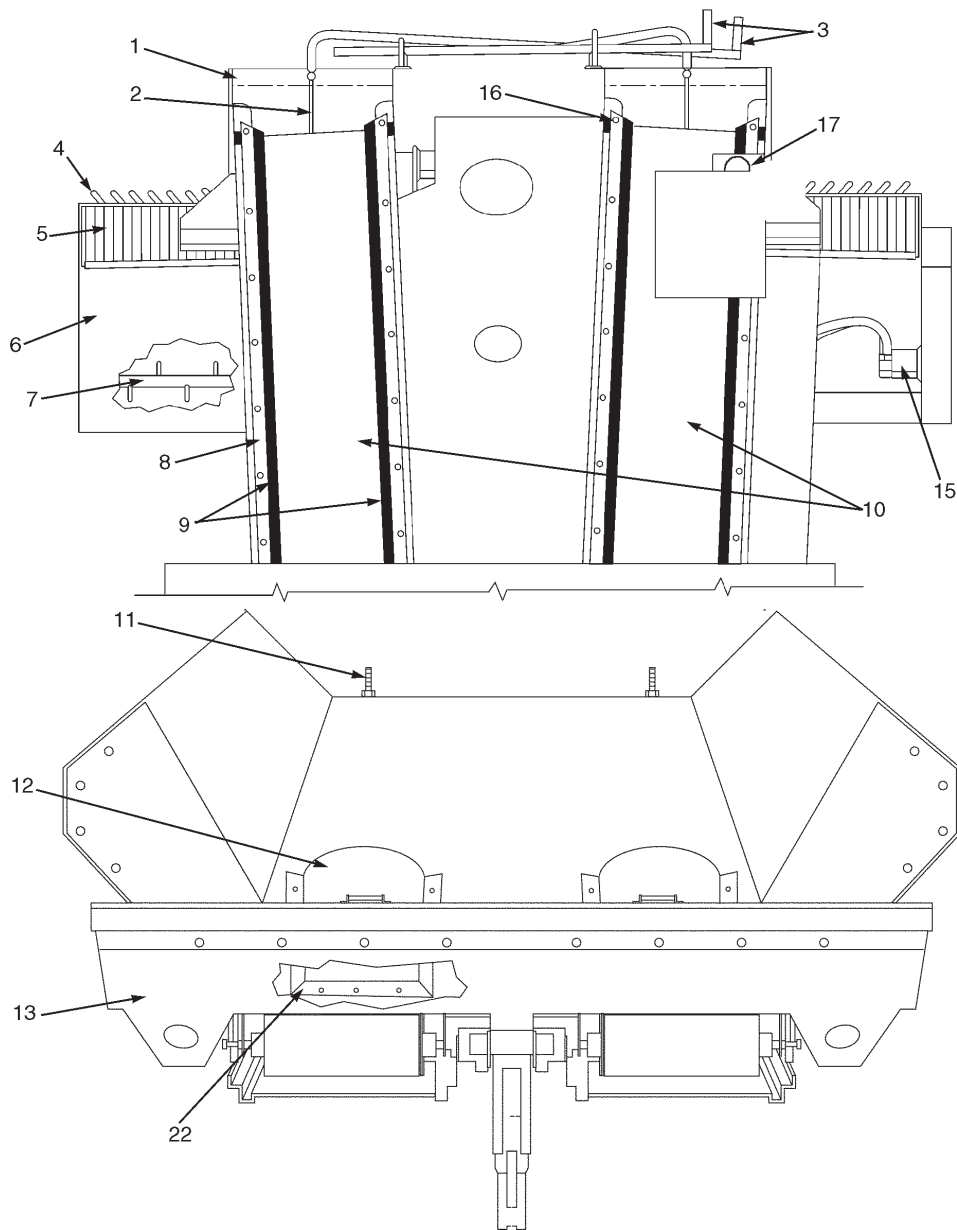


Figure 5
Front View

- | | |
|---------------------------------|------------------------|
| 1. Deflector Hood | 16. Motor, Conveyor |
| 2. Vertical Plate Deflector | 19. Auto Belt Switches |
| 3. Vertical Deflector Reach Rod | 21. Belt Wiper |
| 6. Spread Hopper | |
| 10. Conveyor Belt | |

MAINTENANCE



LB001

Figure 6
Chip Spreader - Top View

- | | |
|----------------------------------|---------------------------------|
| 1. Deflector Hood | 10. Conveyor Belt |
| 2. Vertical Plate Deflector | 11. Feed Gate Adjuster |
| 3. Vertical Deflector Reach Rods | 12. Feed Gate |
| 4. Cut-Off Gate Levers | 13. Receiving Hopper |
| 5. Reject Screens | 15. Motor, Agitator/Spreadroll |
| 6. Spread Hopper | 16. Motor, Conveyor |
| 7. Agitator Shaft | 17. Auxiliary Conveyor Switches |
| 8. Channel Strip | 22. Lagging Skirts |
| 9. Chute Liner | |

MAINTENANCE

Adjust the **chute liners (9)** when necessary by loosening the **channel strip bolts (8)** and moving the **rubber liner (9)** to just touch the **conveyor belt (10)**.

If a section of **chute liner (9)** shows excessive wear, replace it with a genuine ROSCO rubber chute liner (see parts catalog).



ATTENTION: Use genuine ROSCO parts for replacement of rubber conveyor components. Using hard rubber, old conveyor belting, or any other rubber containing fabric or reinforcement, will cause rapid conveyor belt wear and eventual failure.

LAGGING SKIRTS

The **lagging skirts (22)** are mounted at the bottom of the **receiving hopper (13)** and contact the **conveyor belts (10)** immediately above the tail pulley.

Periodically check for clearance between the **lagging skirts (22)** and the **conveyor belts (10)**.

Adjust the **lagging skirts (22)** when necessary by loosening the skirt mounting bolts and moving the rubber skirt to just touch the **conveyor belt (10)**.

If a **lagging skirt (22)** shows excessive wear, replace it with a genuine ROSCO lagging skirt (see Parts Catalog).



ATTENTION: Use genuine ROSCO parts for replacement of rubber conveyor components. Using hard rubber, old conveyor belting, or any other rubber containing fabric or reinforcement, will cause rapid conveyor belt wear and eventual failure.

CONVEYOR BELTS

Proper alignment and tension adjustment of the conveyor belts is necessary to deliver proper system operation and maximum life from the components. In the following paragraphs, the numbers in parenthesis () refer to items in Figure 7.

If mis-alignment or slack is noticed in a conveyor belt, make adjustments as soon as possible to prevent premature wear of the belt and related components. Three pulleys in the conveyor group are adjustable:

- ⇒ **Adjustable Idler (4)**
- ⇒ **Head Pulley (1)**
- ⇒ **Tail Pulley (3)**



WARNING: Keep clear of rotating shafts. Loose clothing or long hair may become entangled. Use patience and caution when adjusting conveyor belts.

A. Alignment Adjustment - Stop conveyors when making adjustments. Load conveyor with material and check results after adjustment is made.

Note: Special care is taken at the factory to align the **head and tail pulleys (1 & 3)** to precise alignment. Therefore, alignment adjustments should be made *first* on the **adjustable idler (4)**.

1. To adjust conveyor belt alignment, tighten the **adjuster nut (6)** on the side opposite the direction you want the belt to move. For example, to move the belt to the left, tighten the right **adjuster nut (6)**.

2. If primary adjustments of the **adjustable idler (4)** fails to cause the conveyor belt to track properly, next adjust the **tail pulley (3)**.

Since the outside **tail pulley adjusters (7)** are more accessible, adjust them by extending (move the belt away from the adjuster) or retracting (move the belt towards the adjuster).

Make small initial adjustments and wait sufficient time between changes to avoid overshooting the desired setting.

MAINTENANCE

B. Tension Adjustment - Belt tension adjustment is necessary periodically since normal working stress causes the conveyor belts to stretch. This is especially true of new belts.

1. To check for slack in a conveyor belt, examine the return side of the belt running under load. Belts with too much slack will bounce enough to contact the conveyor frame.
2. Extend both **tail pulley adjusters (7)** slowly and evenly only enough to eliminate the bouncing. **Do Not Overtighten.**
3. Observe conveyor belt alignment and make adjustments, if necessary, as outlined previously.

C. Replacing Belts - Sufficient adjustment range has been designed into the tail pulley assembly to allow for replacing a conveyor belt without pre-stretching.

Belt splices should be made with No.375 x 20 plate grip fasteners. The fasteners must work on a 10" pulley radius without pulling. Too large a fastener will tear out the belt very quickly.

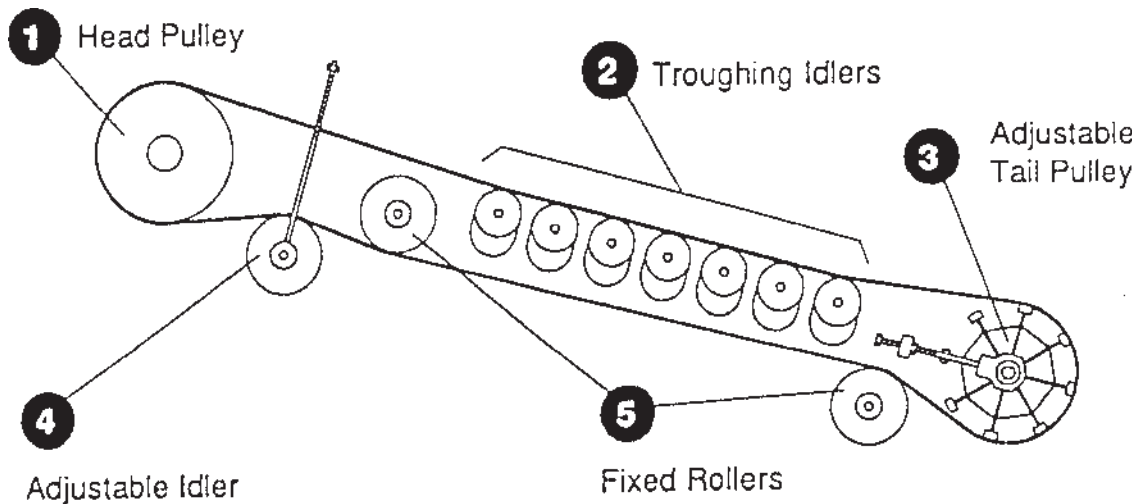
Note: Genuine ROSCO replacement parts for the conveyor belt group are listed in the Parts Catalog of this manual.

CONVEYOR BELT LUBRICATION POINTS

Prior to daily operation of the Chip Spreader, the following conveyor components should be lubricated with a high quality bearing grease:

A. Head Pulley Bearings - 4 places. There is a bearing on each end of each **head pulley (1)**.

B. Tail Pulley Bearings - 4 places. There is a bearing on each end of each **tail pulley (3)**.



*Figure 7
Conveyor Pulley Schematic*

MAINTENANCE

NOTES:

MAINTENANCE

All widths of spread hoppers share common components, however the quantity of these components vary with the hopper width. Components of the spread hopper are shown in Figures 8, 9 and 10. In the following paragraphs, the numbers in parenthesis () refer to items in these figures.

SPREAD HOPPER MAINTENANCE

LUBRICATION

Prior to daily operation of the Chipsreader, the following items on the spread hopper should be lubricated with a high quality bearing grease. Refer to Figure 8.

A. Spreadroll Shaft Bearings - In 2 places. There is a bearing on each end of the spreadroll (1).

B. Agitator Shaft Bearings - In 2 places. There is a bearing on each end of the agitator shaft (2).

C. Gate Pivot Points - Grease zerks are provided on each spread hopper gate. The number of gates depends on the spreadroll width (3).

GATE WEAR PLATES

The spread hopper gate wear plates are adjustable and reversible. Use the adjusting screw with locknut (see Figure 9) to obtain an even 1/16" (1.59 mm) gap between the gate and spreadroll surface. Check this adjustment every 50 hours of service.

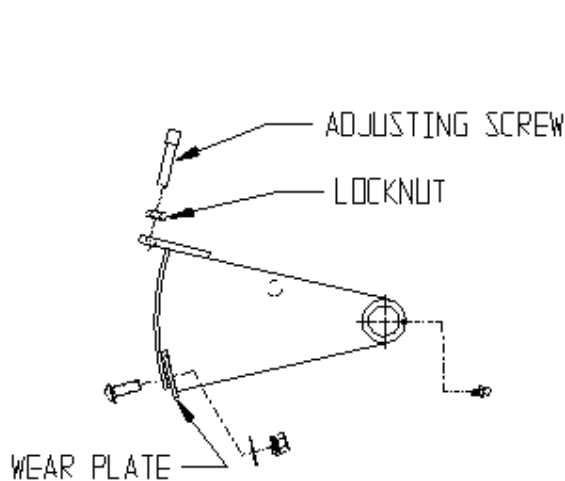


Figure 9

AGITATOR

Components of the spread hopper agitator are illustrated in Figure 10.

The function of the spread hopper agitator is to prevent certain aggregate material, like wet sand, from bridging or arching in the hopper. By preventing material bridging, the agitator assures an even feed of aggregate to the spreadroll.

On each end of the agitator sections is a ductile steel wear plate facing against a fixed wear plate. The fixed wear plates are bolted to the hopper end by the bearing bolts. The plates must be replaced periodically as wear occurs. Neglect of these wear plates will cause shafts and bearings to fail.

SPREADROLL SEAL

The spreadroll seal in the spread hopper, which runs along the length of the spreadroll, should be checked every 50 hours for proper adjustment. Loosen the retaining bolts and slide the spreadroll seal to obtain an even 1/16" (1.59 mm) gap between the seal and the spreadroll for the entire length of the spreadroll.

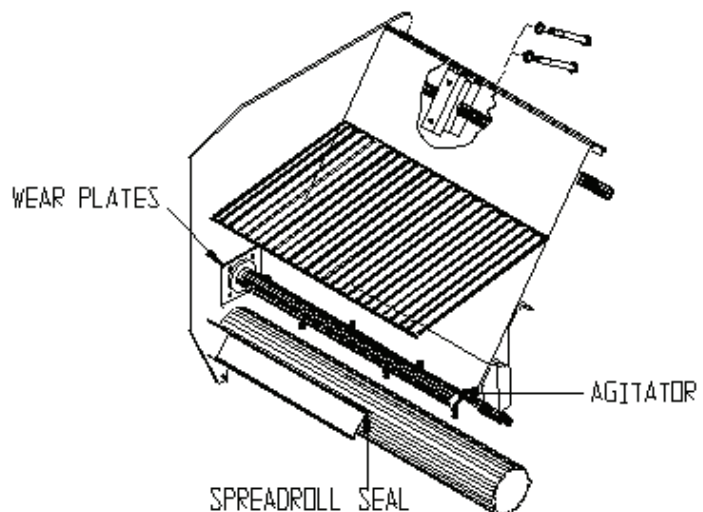


Figure 10

MAINTENANCE

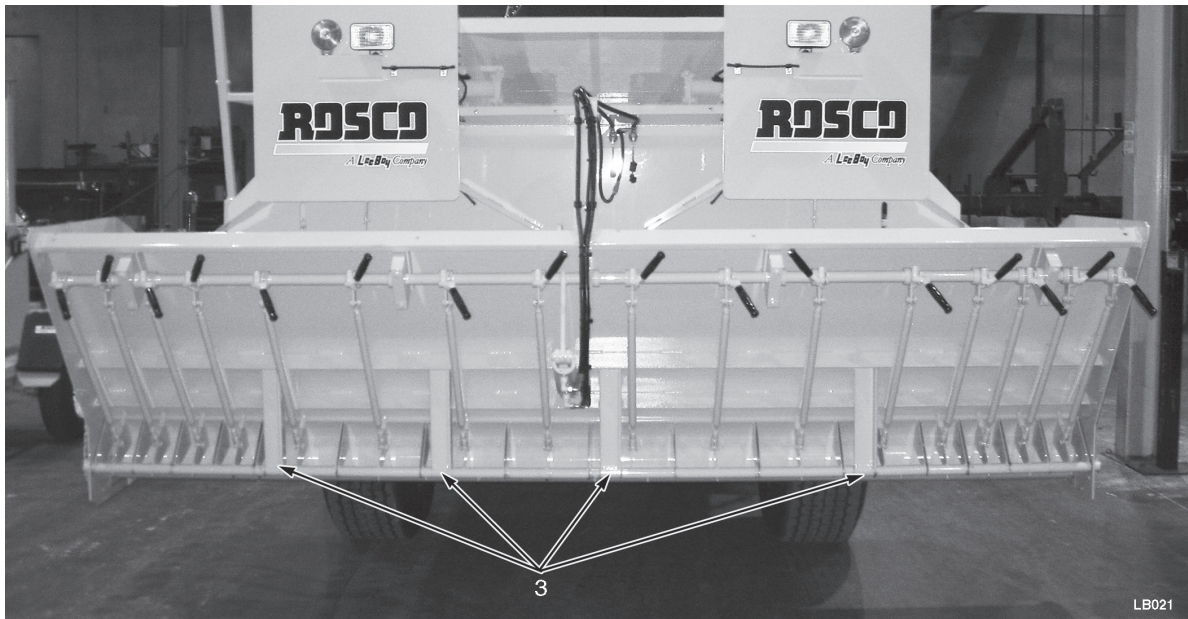
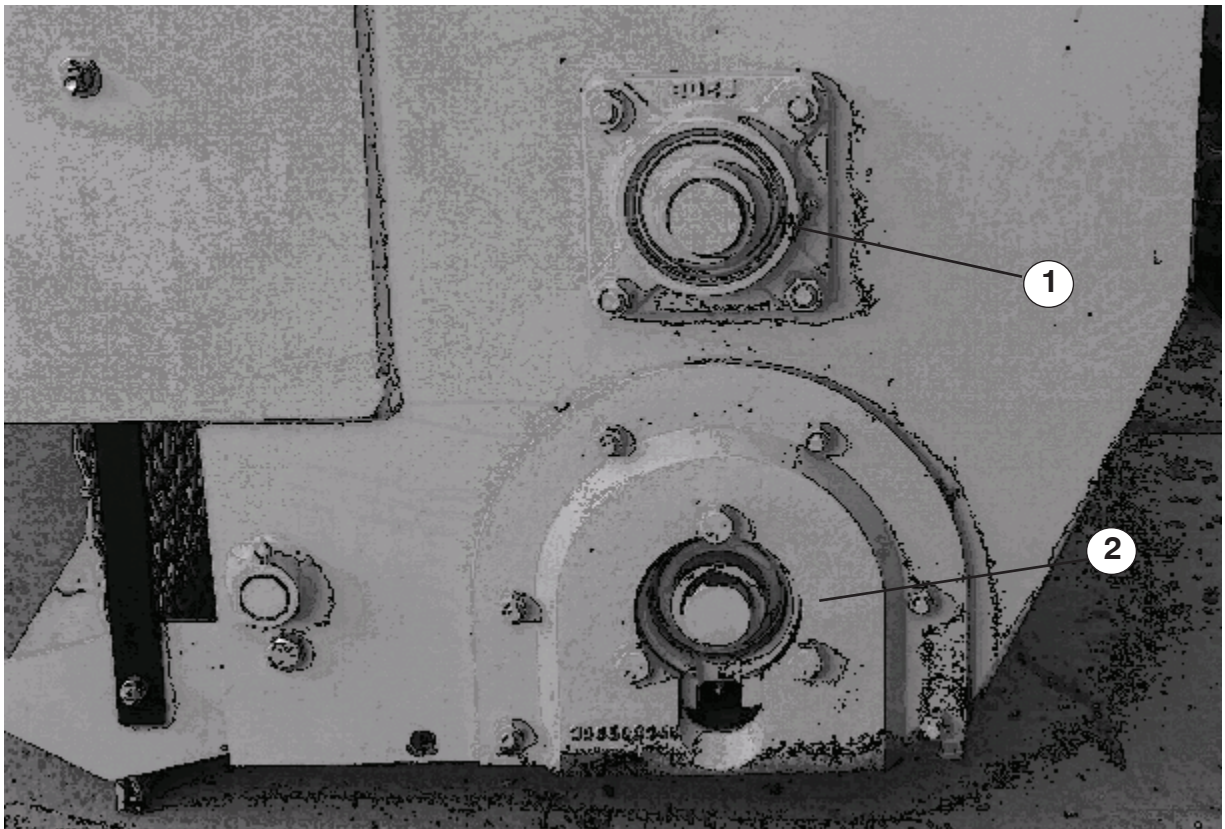


Figure 8

MAINTENANCE

CHASSIS & RUNNING GEAR MAINTENANCE

TIRES

Check the tires daily for damage or noticeably low pressure.

Inflate tires to 50 PSI in front and 65 PSI in the rear for best performance. However, various operating speeds, road bed conditions, truck pulling arrangements, tire options and other operating conditions may require different tire pressure.



ATTENTION: *Never exceed the tire manufacturer's maximum recommended inflation pressure. See the Safety Chapter in this manual for further information on tire maintenance.*

Protect the tires from exposure to petroleum products and other chemicals.

FRONT AXLE & STEERING

The following components of the front axle and steering group require lubrication at intervals per the Preventive Maintenance Chart.

A. Front Axle Oscillating Shaft - In 1 place. A grease zerk is located on the left side of the shaft.

B. Tie Rod Ends - In 2 places. There is one tie rod end on each side of the Chipspreader.

C. King Pins - In 4 places. Two grease zerks are located on each side of the Chipspreader - one on the upper and one on the lower king pin.

D. Wheel Bearings - There are two bearings on the hub assembly of each side of the front axle. Remove and repack the bearings with high quality wheel bearing grease seasonally or after 500 service hours, whichever occurs first. The inner grease seal should be replaced each time the bearings are serviced.

E. Stemco Hub Covers - This optional hub cover includes a see-through cap and rubber fill plug. With Stemco hub covers, the hub assemblies are filled with 90 weight gear lube to lubricate the wheel bearings (instead of wheel bearing grease). The level of the gear lube should be maintained up to the bottom of the fill plug.

TORQUE HUBS

The torque hubs on the rear axle should be checked periodically to make sure they contain the proper amount of gear lube.

There are two drain/fill plugs in the outer end of each torque hub. They are internal hex plugs and are removable with a large Allen wrench. When inspecting the torque hubs, follow these guidelines:

1. Check the level of the gear lube by moving the Chipspreader so that one drain/fill plug is at the 12 o'clock position and the other is at the 9 or 3 o'clock position.
2. Remove the plug positioned at 9 or 3 o'clock. The gear lube level should be just up to the bottom of the hole, indicating the hub case is at its proper half-full volume.
3. If the gear lube level is low, remove the top plug and add EP90 weight gear lube until it just begins to drain out of the lower hole. Then replace both plugs.

If necessary, the torque hubs can be disengaged for emergency towing.



WARNING: *Be sure the wheels of the unit are blocked before disengaging the torque hubs for towing.*

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You may disengage the torque hubs by removing the two bolts (1) on the center of the hub and reversing the disengagement cap (2).

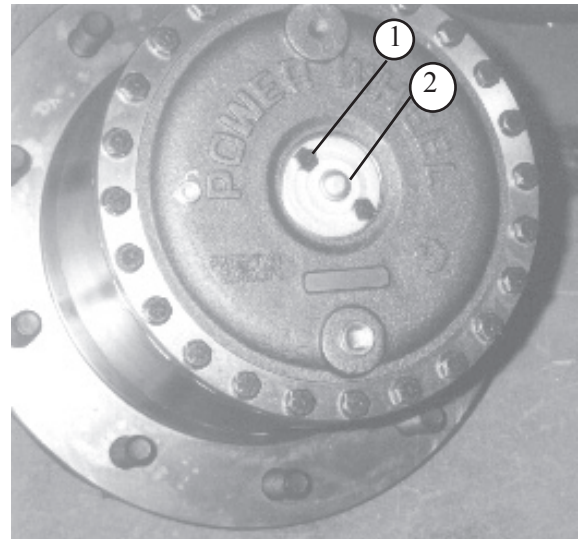


ATTENTION: When torque hubs are disengaged, the Chipsreader will free wheel. Be sure towing vehicle is attached to the Chipsreader before disengaging the torque hubs.

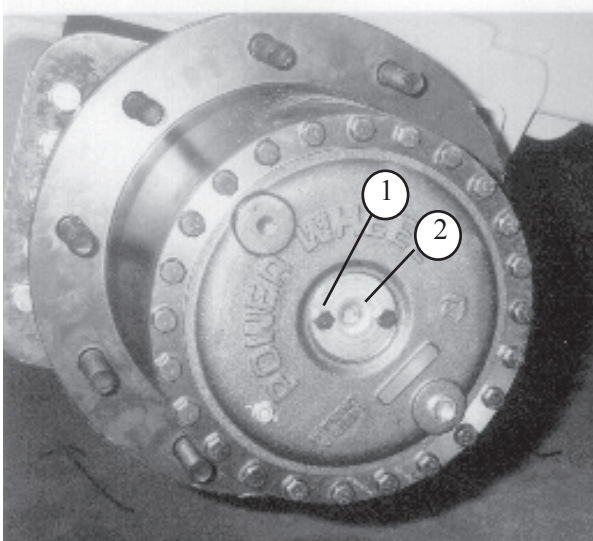


WARNING: Tow *ONLY* at speeds below 10 MPH and only for a short distance to remove from roadway. Be sure to park on level ground, as the parking brake will not work with the hubs disengaged.

After the towing destination is reached, the operator on the Chipsreader should keep the front brakes applied while someone blocks the wheels of the unit before releasing the towing vehicle and before dismounting the Chipsreader.



Torque Hub shown engaged for normal operation.



Torque Hub shown disengaged for emergency towing.

MAINTENANCE

MISCELLANEOUS MAINTENANCE AREAS

BRAKE ADJUSTMENT PROCEDURE (2 Wheel Drive Units)

For safe and effective braking, the following procedures are recommended:



CAUTION: *Failure to properly adjust brakes could cause reduced braking performance.*

1. Grease cam bracket and spider fittings prior to brake shoe installation.

WARNING: *Do not allow grease to come in contact with brake linings. This could cause a reduction in braking performance. Reduced braking performance could cause an accident, resulting in serious injury or death.*



2. Adjust the slack adjuster until the brake lining comes into contact with the brake drum.

A. For green brakes, there should be a slight amount of wheel drag at initial adjustment to compensate for any lining irregularities or high spots.

Note: a green brake is an unground, unburnished brake. There is a break-in period where the lining will seat into a normal contact pattern with the drum.

B. For burnished or broken-in brakes, back off the slack adjuster to achieve .010" (.25 mm) clearance between drum and shoe.

3. Apply brakes using normal truck operating pressure. (Average line pressure should be 90 psi.)



WARNING: *Air pressure in excess of 130 psi could result in failure of the air chamber or spring brake chamber, which could result in serious injury or death.*

A. Check the amount of push rod travel. Maximum should not exceed 2 1/2" (6.35 cm) for Type 30 Long Stroke chambers, 2" (5.08 cm) for Type 30 chambers and 1 3/4" (4.45 cm) for Type 24 chambers.

1. Optimum push rod travel on a green brake should be under 2" (5.08 cm).

2. Optimum push rod travel on a burnished or broken-in brake should be under 1 3/4" (4.45 cm).

B. Check the angle between the slack adjuster and push rod. With the brakes applied, the angle should be 90° +/- 5°.

When Automatic Brake Adjusters are used, it is necessary to follow the installation and adjustment procedures recommended by the Automatic Brake Adjuster manufacturer.



ATTENTION: *Failure to follow the recommended procedure for Automatic Brake Adjusters could result in improper operation of the automatic slack adjuster, resulting in reduced brake performance or premature lining wear.*

C. For burnished brakes, apply pressure to brakes and check for lining to drum contact. Using a .010" (.25 mm) feeler gauge, the lining to drum contact should range from 60 to 100% during brake application.

D. Check to ensure the lining is inside the drum during application. More than .060" (1.52 mm) protruding out of the drum is not recommended.

4. Rapidly release air pressure from the brakes and confirm that all brakes quickly release to the normal relaxed position.

MAINTENANCE

WARNING: Any brake drum reaching maximum wear diameter, as cast on drum by turning, grinding and/or wearing **is unsafe** and should be replaced immediately. Any brake drum exceeding this dimension is a safety hazard and could cause serious injury or death. If in doubt, contact the brake drum manufacturer.



WARNING: Brake linings contain non-asbestos fibers. Breathing brake dust may be hazardous to your health and may cause serious respiratory or other bodily harm.

When working on brake drums and linings, use the following precautions:



- **Avoid creating dust.**
- **Do not remove brake drum without proper protective equipment.**
- **Do not work on brake linings without proper protective equipment.**
- **Do not replace brake linings without proper protective equipment.**
- **Do not sand, grind, chisel, file, hammer or alter brake linings without proper protective equipment.**
- **Follow O.S.H.A. standards for proper protective devices to be used when working with brake materials.**

HITCH MAINTENANCE

There are two (2) lubrication points on the positive lock truck hitch that should be serviced prior to daily operation of the Chipspreader. A grease zerk is provided on the pivot point at each side of the hitch assembly (visible at the rear of the machine). Other pivot points of the hitch linkage are mounted with sealed bearings which require no lubrications.

CONTROL CONSOLE MAINTENANCE

There are four (4) lubrication points on the control console support tube assembly that should be serviced prior to daily operation of the Chipspreader. Two (2) grease zerks are provided on each end of the support tube assembly.

Also wipe off all gauges and warning lights before the start of each day to be sure the operator has clear visibility of all system warnings and gauges.

LIGHTING MAINTENANCE

If the unit is equipped with a lighting system, be sure all lights are clean and securely mounted.

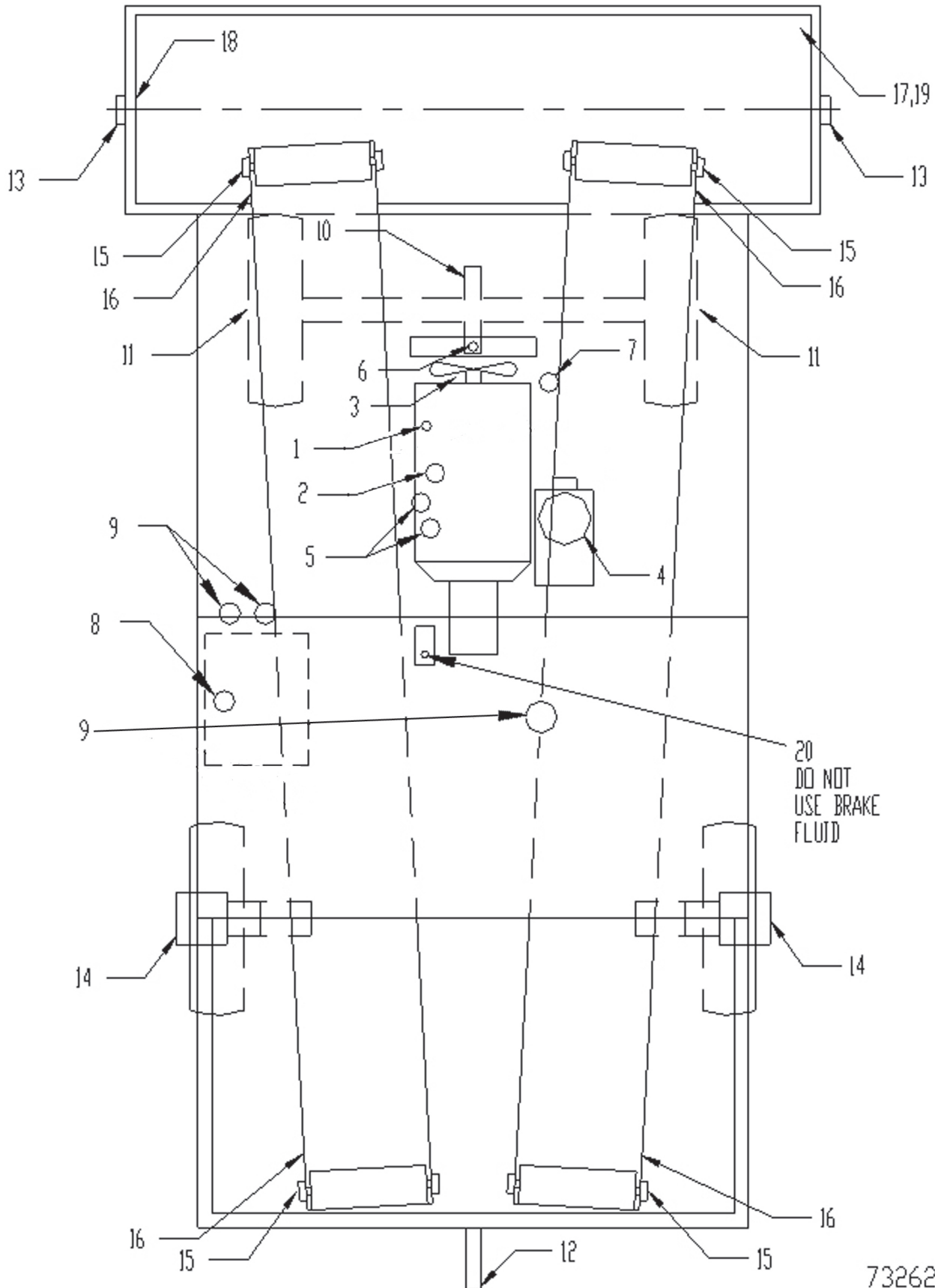
Also check the following:

- A. Inspect all lights daily for proper operation.
- B. If a light or group of lights does not function:
 1. Check for a blown fuse. The fuse panel is located behind a panel on the right side of the control console.
 2. Examine all visible wiring connections, making sure that they are securely fastened.
 3. If the light(s) still does not work, remove the lens from the light and inspect the bulb(s), replacing any that appear damaged or discolored.
 4. If the trouble is not located, inspect the wiring harness for damage. Wiring schematics are provided in the "*Parts Catalog*" of this manual to assist in trouble shooting the Chipspreader electrical system and wiring harness.

C. If broken wires are found, solder them together and cover with a shrink wrap plastic covering to prevent contamination of the solder joint. If shrink wrap is not readily available, electrician's tape should be wrapped tightly around the solder joint to prevent a short circuit.

D. After making repairs to a wiring harness, always replace or repair the protective loom which covers the wiring to prevent future damage to the wiring harness. Examine the routing of the harness and make sure that it is not subject to excessive movement which causes broken wiring. Always make sure that all wiring harnesses are securely fastened.

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MAINTENANCE

PREVENTIVE MAINTENANCE AND LUBRICATION CHART

ITEM	DESCRIPTION	LUBE TYPE	OPERATION	
1	ENGINE OIL LEVEL	EO	I	R2
2	ENGINE OIL FILTER	C	R2	
3	ENGINE BELT WEAR & TENSION		I	
4	ENGINE AIR FILTERS	C	R2	
5	ENGINE FUEL FILTERS	C	S	R5
6	ENGINE COOLANT LEVEL		I	
7	ENGINE COOLANT FILTER (OPT)		R5	
8	HYDRAULIC OIL LEVEL	HTF	I	R5
9	HYDRAULIC OIL FILTER	C	R5	
10	FRONT AXLE OSCILLATION	MPG	L	
11	FRONT AXLE OIL FRONT PLANATARY HUBS	Mobil 424 Mobil 424	R5 R5	
12	TRUCK HITCH ASSEMBLY	MPG	L	
13	SPREAD HOPPER BEARINGS		L	
14	REAR AXLE TORQUE HUBS	SPC	R5	
15	CONVEYOR PULLEY BEARINGS	MPG	L	
16	CONVEYOR BELT ALIGNMENT		I	A2
17	SPREAD HOPPER GATES		I	A2
18	SPREAD ROLL SEAL		I	A2
19	GATE WEAR PLATE		I	A2
20a	BRAKE MASTER	DTE 11M	I	R5
20b	BRAKE ACCUMULATOR	HTF	I	R5

OPERATION CODE:

I = INSPECT DAILY A2 = ADJUST EVERY 250 HOURS
 A = ADJUST DAILY R2 = REPLACE EVERY 250 HOURS
 L = LUBRICATE DAILY R5 = REPLACE EVERY 500 HOURS
 S = SERVICE DAILY

LUBE TYPE:

EO = ENGINE OIL
 C = CARTRIDGE ELEMENT
 HTF = HYDRAULIC FLUID
 MPG = MULTI-PURPOSE GREASE
 SPC = EP-90

MAINTENANCE

PREVENTIVE MAINTENANCE CHART

Identifying Codes: I = Inspect L = Lubricate R = Replace
A = Adjust S = Service

ITEM	MAINT INTERVAL				CAPACITIES		PART NUMBER		TYPE OF SUPPLIES REQUIRED
	Daily	50 Hours	250 Hours	500 Hours	CAT 173 HP	CAT 202 HP	CAT 173 HP	CAT 202 HP	
Engine Oil	I		R		17 qts 16.5 L	17 qts 16.5 L			CC/CD 15W40
Engine Oil Filter			R				988676-02	988676-02	Cartridge Filter
Engine Belt	I		I/A				988676-01	988676-01	V-Rib Belt
Engine Air Filter	I	I	R	I		Safety- Primary-	988676-05 988676-04	988676-05 988676-04	Cartridge Filter
Engine Fuel Filter(s)	S			R			Primary - Water Separator -	988676-03 998676-04	Cartridge Filter
Engine Coolant	I		I		22 qts 21 L	22 qts 21 L			50/50 Antifreeze
Hydraulic Fluid	I	I	I	R	50 gal Reservoir	189 L			See Hydraulic Fluids chart
Hydraulic Oil Filters				S S R R	100 GPM Strainer 25 GPM Strainer Charge Pump 50 GPM Return 25 GPM Return		998939 33148 1003069-01 38327-01 X260	998939 33148 1003069-01 38327-01 X260	Cartridge Filters
Front Axle Osc. Shaft/Steering	L								Multi-Service Grease
Front Axle		I		R	16 qts 15.14 L				Mobil 424
Front Axle Planetary		I		R	1.6 qts 1.5 L				Mobil 424
Truck Hitch	L								Multi-Service Grease

MAINTENANCE

PREVENTIVE MAINTENANCE CHART

Identifying Codes: I = Inspect L = Lubricate R = Replace
A = Adjust S = Service

ITEM	MAINT INTERVAL				CAPACITIES		PART NUMBER		TYPE OF SUPPLIES REQUIRED
	Daily	50 Hours	250 Hours	500 Hours	173 HP ^{CAT}	202 HP ^{CAT}	173 HP ^{CAT}	202 HP ^{CAT}	
Spread Hopper Bearings	L								Multi-Service Grease
Rear Axle Torque Hubs	I	I	I	R	3.1 qts (2.93 L)	3.1 qts (2.93 L)			Gear Lube EP 90
Conveyor Pulley Bearing	L		L						
Conveyor Belt Alignment	I	I/A	I/A	A					
Spread Hopper Gate Adjust.	I		I/A	I/A					
Spreadroll Seal Adjustment	I	I/A	A						
Gate Wear Plate Adjust.	I	I/A	I/A						

MAINTENANCE

HYDRAULIC FLUIDS

The below recommended hydraulic oils have been reviewed by Rosco and are recommended as replacements. It is best to use the heaviest weight oil that can be safely used for the temperature range of machine operation. If your machine will never be used at below 0°F temperatures, we recommend that you use a heavier weight oil.

If you are considering using an oil that is not listed, contact the Rosco factory to obtain the specifications that the hydraulic oil must meet to provide the needed lubrication and cooling for the units' hydraulic components.

HYDRAULIC OIL REQUIREMENTS AND APPROVED BRANDS FOR FIELD FILL:



DO NOT MIX manufacturers or grade weights when adding hydraulic oil.

Be sure hydraulic oil selection is compatible with your hydraulic system.

Be sure to use mineral base hydraulic oil.

Be sure hydraulic oil selection assistance is from a reputable supplier.

Be sure the hydraulic specifications meet or exceed the following specifications.

Hydraulic oil must provide anti-wear properties that meet or exceed those found in the API (American Petroleum Institute) classification SD, SE or CC crank case oil.

Hydraulic oil viscosity must not fall below 70 SUS (13 cs) in the reservoir under the most adverse conditions. The best viscosity being 80-300 SUS (17 cs to 65 cs). The viscosity rating at the lowest expected start-up temperature should not exceed 10,000 SUS (2158 cs).

Hydraulic oil must have rust and oxidation inhibitors that will maintain chemical stability. When changing the hydraulic oil with oil other than the specific factory fill oil listed below, the hydraulic system must be completely drained. Be sure to purge or drain all hoses, cylinders, valves, motors and pumps of hydraulic oil. All hydraulic oil filters must also be changed at this time.

ISO 46 / SAE 20 AMBIENT TEMP. -15°F TO 80°F (-26° TO 27°C)	ISO 68 AMBIENT TEMP. -0°F TO 100°F (-18° TO 38°C)	ISO 100/SAE 30 AMBIENT TEMP. 15°F TO 115°F (-9° TO 46°C)
Special Start-up Below 5°F (-15°C)	Special Start-up Below 20°F (-7°C)	Special Start-up Below 32°F (0°C)
Hyd Res Temp Max 165°F (74°C)	Hyd Res Temp Max 185°F (85°C)	Hyd Res Temp Max 200°F (93°C)
MOBIL DTE 25	MOBIL DTE 26	MOBIL DTE AW 100/DTE 18M
CITGO AW 46	CITGO AW 68	CITGO AW 100
CONOCO PHILLIPS 46	CONOCO PHILLIPS 68	CONOCO PHILLIPS 100
CHEVRON TEXACO AW 46	CHEVRON TEXACO AW 68	CHEVRON TEXACO AW 100
SHELL TELLUS 46	SHELL TELLUS 68	SHELL TELLUS 100
EXXON NUTO 46	EXXON NUTO 68	EXXON NUTO 100

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HYDRAULIC FITTING TORQUE

Tightening Flare Type Tube Fittings

1. Check the flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Lubricate connection and hand tighten swivel nut until snug.
4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

Note: *The torque values shown are based on lubricated connections as in assembly.*

Tube Size OD		Nut Size Across Flats		Torque Value (see note)		Recommended Turns to Tighten (After Finger Tightening)	
in	mm	in	mm	N.m.	lb-ft	Flats	Turns
3/16	4.76	7/16	11.11	8	6	1	1/6
1/4	6.35	9/16	14.29	12	9	1	1/6
5/16	7.94	5/8	15.88	16	12	1	1/6
3/8	9.53	11/16	17.46	24	18	1	1/6
1/2	12.70	7/8	22.23	46	34	1	1/6
5/8	15.88	1	25.40	62	46	1	1/6
3/4	19.10	1¼	31.75	102	75	¾	1/8
7/8	22.23	1-3/8	34.93	122	90	¾	1/8

TIGHTENING O-RING FITTINGS

1. Inspect O-ring and seat for dirt or obvious defects.
2. On angle fittings, back the lock nut off until washer bottoms out at top of groove.
3. Hand tighten fitting until back-up washer or washer face (if straight fitting) bottoms on face and O-ring is seated.
4. Position angle fittings by unscrewing no more than one turn.
5. Tighten straight fittings to torque shown.
6. Tighten while holding body of fitting with a wrench.

Note: *The torque values shown are based on lubricated connections as in reassembly.*

Tube Size OD		Nut Size Across Flats		Torque Value (see note)		Recommended Turns to Tighten (After Finger Tightening)	
in	mm	in	mm	N.m.	lb-ft	Flats	Turns
3/8	9.53	1/2	12.70	8	6	2	1/3
7/16	11.11	9/16	14.29	12	9	2	1/3
1/2	12.70	5/8	15.88	16	12	2	1/3
9/16	14.29	11/16	17.46	24	18	2	1/3
3/4	19.10	7/8	22.23	46	34	2	1/3
7/8	22.23	1	25.40	62	46	1½	1/4
1-1/16	26.99	1¼	31.75	102	75	1	1/6
1-3/16	22.23	1-3/8	34.93	122	90	1	1/6
1-5/16	33.34	1½	38.10	142	105	¾	1/8
1-5/8	41.28	1-7/8	47.63	190	140	¾	1/8
1-7/8	47.63	2-1/8	53.98	217	160	½	1/12

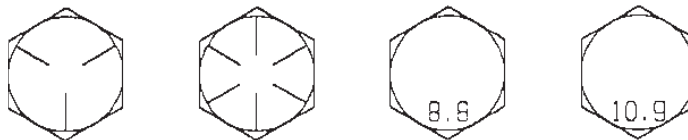
MAINTENANCE

BOLT TORQUE CHART

The table below gives the correct torque values for various **NON-LUBRICATED** bolts. **DO NOT** lubricate bolts unless otherwise specified in this manual. Check tightness of bolts periodically, using this table as a guide. **ALWAYS** replace hardware with an equal strength fastener. When using locking fasteners, increase torque values by 5%.

Bolt Identification By Head Markings:

ft-lb = foot-pounds
N-m = Newton-meter



Bolt Size	English				Metric			
	Grade 5		Grade 8		Class 8.8		Class 10.9	
	ft-lb	N-m	ft-lb	N-m	ft-lb	N-m	ft-lb	N-m
M6					7	10	11	15
1/4	9	12	12	17				
5/16	19	25	27	36				
M8					18	25	26	35
3/8	33	45	45	63				
M10					37	50	52	70
7/16	53	72	75	100				
M12					66	90	92	125
1/2	80	110	115	155				
M14					103	140	148	200
9/16	115	155	165	220				
5/8	160	215	220	305				
M16					166	225	229	310
3/4	290	390	400	540				
M20					321	435	450	610
7/8	420	570	650	880				
M24					553	750	774	1050
1	630	850	970	1320				
M30					1130	1495	1550	2100

TROUBLESHOOTING

The following Troubleshooting Guide includes some problems that an operator may encounter during the course of operating the Chipsreader. It also includes some acceptable corrections to these problems. Unless otherwise noted, the problems listed here are those which an operator can diagnose and repair. See an authorized ROSCO Dealer/Distributor for diagnosis and repair of problems **not** listed. For specific engine and hydraulic system problems not covered by this guide, please refer to the engine or hydraulic pump/motor manufacturer's manual.



DO NOT attempt to service or repair major components, such as the engine, hydrostatic pump or motor etc., unless authorized to do so by your ROSCO Dealer/Distributor. ANY UNAUTHORIZED REPAIR WILL VOID THE WARRANTY.

When a problem occurs, don't overlook the simple causes. For example, a starting problem could be caused by something as simple as an empty fuel tank. After a mechanical failure has been corrected, be sure to locate and correct the cause of the problem.

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TROUBLESHOOTING

Problem	Cause	Solution
Engine Doesn't Crank	Battery is weak or dead.	Charge or replace battery.
	Park brake switch not "ON".	Park brake switch must be "ON" to start engine.
	Neutral start switch not activated.	Put direction control lever in neutral.
	Faulty ignition switch.	Replace.
	Faulty start solenoid.	Replace.
	Faulty solenoid on starter or faulty starter.	Repair/Replace.
	Faulty wiring.	Repair/Replace.
Engine Cranks but Won't Start (No Smoke From Exhaust)	No fuel in fuel tank.	Add fuel to fuel tank.
	No voltage to fuel shut off solenoid.	Check fuel shut off voltage (voltage should be a minimum of 9 volts with the ignition key on during cranking).
	No fuel to the injector pump.	Check fuel supply system.
	Fuel connections loose on suction side of injector pump.	Tighten all fuel filter fittings and connections from the fuel tank to the injector pump.
	Fuel filter plugged or restricted.	Replace the fuel filter(s).
	Intake or exhaust system restricted.	Check for and remove restrictions.
Engine Difficult to Start or Won't Start	Engine cranking speed too low (below 150 RPM).	Repair/clean battery terminal connections. Charge/replace battery.
	Insufficient supply of fuel to injector nozzles.	Check fuel system. Clean/replace fuel filter.

(cont.)

(cont.)

(cont.)

TROUBLESHOOTING

Problem	Cause	Solution
Engine Difficult to Start or Won't Start (cont.)	Fuel solenoid is defective.	Check/replace defective fuel solenoid. (See engine manual).
	Fuel filter is plugged.	Replace the fuel filter(s).
	Air in the fuel system.	Check for air leaks in the low pressure side of the fuel system. Prime the fuel system. (See engine manual).
	Fuel supply is contaminated.	Verify by operating engine with a fuel of known quality.
	Intake air system is restricted.	Check for and remove restrictions.
Unit Doesn't Move with Engine Running or Moves in One Direction Only	Park brake switch "ON".	Turn park brake switch "OFF".
	Hydrostatic pump forward/reverse relief valves not seated.	Relief valves can be turned out 2 turns for towing. Check and turn hex nut cartridges in (clockwise) to seat valves.
	Insufficient hydraulic system charge pressure to release park brake.	See problem " <i>Brake Won't Release or Only Partially Releases</i> ".
	No voltage to control handle.	Check voltage and wiring.
	Forward/reverse relief valves are bypassing oil at low pressure.	Repair/replace relief valve cartridge(s).
	Damaged hydrostatic pump.	Repair/replace hydrostatic pump.
	Damaged hydrostatic motor.	Repair/replace hydrostatic motor.
	Damaged torque hub.	Repair/replace torque hub.
Faulty control handle.	Repair/replace control handle.	
Unit Jerks When Operating in Forward or Reverse	Fast movement of direction control handle.	Move handle slowly when changing speed and/or direction.

(cont.)

(cont.)

(cont.)

TROUBLESHOOTING

Problem	Cause	Solution
Unit Jerks When Operating in Forward or Reverse (cont.)	Parking brake not fully disengaged.	See problem " <i>Brake Won't Release or Only Partially Releases</i> ".
	Engine speed set too low.	Run engine at maximum RPM.
	Low hydraulic fluid level.	Fill hydraulic fluid reservoir with correct fluid until visible in the sight gauge.
	Air leaking into hydraulic system.	Tighten or replace hoses, fittings, and/or filter(s).
	Hydrostatic pump is malfunctioning.	Repair/replace the pump.
Engine Power Output is Low	Excessive load for engine horsepower rating.	Reduce load on unit by reducing ground speed.
	Operating engine at high altitude.	De-rate engine power output for altitudes above 1000 feet (305 m).
	Air intake piping is restricted or air cleaner element is dirty.	Remove restrictions. Replace air cleaner element(s).
	Fuel suction line or fuel filter is restricted.	Check fuel line for restrictions. Replace fuel filter element(s).
	Fuel return system is restricted.	Check/correct restricted fuel return system.
	Fuel transfer pump is malfunctioning.	Check/replace fuel transfer pump. (See engine manual).
	Throttle lever is improperly adjusted.	Check/adjust throttle controls.
	Injector is malfunctioning.	Check/replace injector. (See engine manual).
	Poor quality fuel.	Verify by operating with a fuel of known quality.

TROUBLESHOOTING

Problem	Cause	Solution
Steering is Difficult	Low hydraulic fluid level.	Add hydraulic fluid to proper level. (See <i>Maintenance Chapter</i>).
	Hydraulic reservoir return filters contain contamination.	Check return filter(s) for contamination and replace if necessary. (See <i>Maintenance Chapter</i>).
	Hydraulic relief valve in steering circuit is set incorrectly.	Check relief valve setting (should be at 1250 PSI.) Adjust setting if necessary.
	Worn hydraulic pump.	Check for worn pump. Repair/replace.
	Worn steering orbitrol motor.	Check for worn steering orbitrol motor. Repair/replace.
	Worn or damaged steering cylinder.	Repair/replace steering cylinder.
Hydraulic System Overheats (Temperature above 220° F or 104.4° C)	Low hydraulic fluid level.	Fill with the correct fluid until fluid is visible in the sight gauge.
	Defective gauge or sender giving wrong temperature reading.	Replace gauge or sender.
	Primary relief valve on pump set too low or left out when towed.	Adjust setting to 5090 PSI on both Forward/Reverse. (See pump service manual).
	Excessive air temperature and high duty cycle.	Operate unit at slower ground speed and maximum engine RPM during hot weather.
	Plugged fins on oil cooler.	Clean fins and correct any other problems with cooling air flow.
	Worn out hydrostatic pump.	Repair or replace.

TROUBLESHOOTING

Problem	Cause	Solution
Engine Oil Pressure Low	Electrical power not being supplied to gauge.	Check fuse.
	Incorrect oil level.	Check for oil leaks. Add or drain engine oil. Check dipstick calibration.
	Oil filter plugged.	Change full flow oil filter.
	Oil diluted with fuel.	Check/replace injector, fuel transfer pump and/or injection pump.
	Oil diluted with coolant.	See authorized repair facility.
	Incorrect oil specifications.	Change oil and check oil specifications. (See <i>Maintenance chapter</i> in this manual and engine manual).
	Oil pressure sender or gauge malfunctioning.	Replace oil pressure sender or gauge.

Engine Coolant Temperature is Above Normal	Coolant level too low.	Add coolant.
	Unit operating with excessive loads.	Reduce unit loading.
	Radiator fins are damaged or obstructed with debris.	Inspect radiator fins. Clean/repair or replace.
	Collapsed or restricted radiator hose(s).	Inspect radiator hoses. Replace if necessary.
	Loose fan drive belt.	Check belt tension and tighten if necessary.
	Cooling fan shroud damaged or missing.	Inspect shroud. Repair, replace or install as needed.
	Incorrect or malfunctioning radiator cap.	Check the radiator cap. Replace if necessary.

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TROUBLESHOOTING

Problem	Cause	Solution
Engine Coolant Temperature Above Normal (cont.)	Temperature gauge or sender malfunctioning.	Repair/replace the sender or gauge.
	Thermostat stuck in closed position.	Test thermostat. Replace if necessary.
	Dirt, scale or rust in the cooling system.	Clean cooling system.
	Loose wiring, faulty connection.	Repair/replace loose wiring or connector.

Alternator Not Charging	Diode at alternator loose or faulty.	Tighten connection or replace diode.
		Adjust or replace belt.
	Alternator belt loose or broken.	Replace alternator.
	Alternator malfunctioning.	Replace gauge or sender.
	Faulty gauge or sender.	Repair/replace loose wiring or connector.
	Loose wiring or faulty connection.	

Instruments Won't Work	Faulty wiring.	Repair/replace loose wiring or connector.
	No voltage to control panel.	Check fuse panel for blown fuse.

TROUBLESHOOTING

Problem	Cause	Solution
Parking Brake Won't Release	Engine not running.	Engine must be running to release brake.
	Park brake switch is "ON".	Turn park brake switch "OFF".
	Faulty brake switch.	Replace switch.
	Loose wiring to brake solenoid.	Repair/replace wiring.
	Faulty solenoid to brake valve.	Replace solenoid cartridge or coil.
	Low charge pressure to brakes (300 PSI or less).	Check/adjust charge relief valves on hydrostatic pump to 350 to 400 PSI in neutral. Engine must be at maximum RPM when adjusting charge pressure. Repair/replace hydrostatic pump.
	Faulty brake.	Repair/replace brakes.
Parking Brake Won't Hold	Park brake switch not "ON".	Red indicator light should come on when park brake switch is "ON".
	Faulty switch/wiring allowing electrical power to brake solenoid valve when switch is in "OFF" position.	Repair/replace switch or wiring.
	Faulty brake.	Repair/replace brake(s) on rear wheels.
Park Brake Indicator Light Comes On When Traveling	Park brakes are spring applied and hydraulically released. Hydraulic pressure has dropped to 300 PSI or less.	Check the hydrostatic travel system charge pressure. (See the previous section " <i>Low charge pressure to brakes.</i> ")
Unit Won't Shift to "High" Range (default is "Low" range)	Faulty switch.	Check/replace if necessary.
	Loose wiring or connector to the two-speed solenoid valve.	Repair/replace wiring or connections.

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TROUBLESHOOTING

Problem	Cause	Solution
Unit Won't Shift to "High" Range (default is "Low" range) (cont.)	Faulty solenoid on two-speed solenoid valve.	Replace solenoid cartridge or coil.
Conveyor Belt Not Running In the Center of the Conveyor (May run true when not loaded but not under load)	Conveyor belts out of adjustment.	Adjust belt alignment. (See <i>Maintenance Chapter</i> in this manual). Adjust belt tension. (See <i>Maintenance Chapter</i> in this manual).
	One or more of the trough rollers are not turning.	Clean debris out of the roller. Replace if the roller has a flat spot or will not free-up.
Spreadroll Fails to Operate When Gates are Opened	Spread hopper agitator or spreadroll jammed with aggregate or foreign material.	Remove aggregate or foreign material.
	Low hydraulic fluid level.	Add fluid to proper level. (See <i>Maintenance Chapter</i> in this manual.)
	Hydraulic reservoir return filters contain contamination and/or are plugged.	Check return filter(s) for contamination and replace if necessary.
	Hydraulic relief valve in spread hopper control circuit set incorrectly.	Check relief valve setting (should be set at 2700 PSI.) Adjust setting if necessary.
	Worn hydraulic pump and/or motor.	Check for worn pump and/or motor and repair or replace if necessary.
Conveyors Fail to Operate	Low hydraulic fluid level.	Add fluid to proper level.
	Hydraulic reservoir suction strainers contain contamination.	Check suction filter for contamination. Clean or replace as necessary.

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TROUBLESHOOTING

Problem	Cause	Solution
Conveyors Fail to Operate (cont.)	No electrical power to conveyor control solenoid valve.	<p>Check for electrical power at the conveyor solenoid valves when the dash conveyor control switch is set to "MANUAL" and the auxiliary conveyor switches are "ON".</p> <p>If power is available, and the problem is not hydraulic system related, replace solenoid cartridge.</p> <p>If there is no power at the solenoid valves, check for electrical power at the conveyor control switch and auxiliary conveyor switches.</p> <p>If power is available, switches may need replacement.</p> <p>If there is no power, check wiring to switches - look for shorts or incorrectly connected wires. (See wiring schematics in the <i>Parts Catalog</i> in this manual)</p>
	Sheared key in motor/head pulley drive coupling.	Replace key.
	Faulty relief cartridge on conveyor solenoid valve.	Exchange relief cartridge with another cartridge on the machine. If the problem doesn't transfer to the other function on the machine, cartridge is OK. If the problem transfers, replace the cartridge.
	Worn hydraulic pump or motor.	Check for worn pump or motor. Replace if necessary.
Aggregate Material is Not Distributing Evenly in Spread Hopper	Conveyor hood deflector out of adjustment.	Adjust conveyor hood deflector. (See <i>Operation Chapter</i> in this manual.)

TROUBLESHOOTING

Problem	Cause	Solution
Spread Hopper Gates Fail to Open	Low hydraulic fluid level.	Add fluid to proper level. (See <i>Maintenance Chapter</i> in this manual.)
	Hydraulic reservoir return filters contain contamination.	Check return filter(s) for contamination and replace if necessary. (See <i>Maintenance Chapter</i> in this manual.)
	Gate opener jammed with aggregate or other foreign material.	Remove aggregate or foreign material.
	Hydraulic relief valve in gate opener circuit set incorrectly.	Check relief valve setting (should be set at 250 PSI.) Adjust setting if necessary.
Aggregate Builds Up Behind Auto Conveyor Paddles (Fails to Shut Off Conveyors)	Conveyor hood deflector out of adjustment.	Adjust conveyor hood deflector. (See <i>Operation Chapter</i> in this manual).
	Control paddle bent.	If control paddle is bent forward, bend to a position slightly to the rear of vertical.
	Conveyors operating too fast and/or spread hopper gates closed on one side of the hopper (for narrow spread width).	On units with variable speed conveyor controls, slow down belt speed on side of spread hopper with closed gates. Operate conveyor belt manually with auxiliary conveyor switch on side of spread hopper with gates closed.

TROUBLESHOOTING

Problem	Cause	Solution
Conveyors Fail to Operate with Auto Conveyor Control	If conveyor control switch is set to "MANUAL", see problem "Conveyors Fail to Operate".	See problem " <i>Conveyors Fail to Operate</i> ".
	If conveyor control switch is set to "AUTO", possible causes are: <ul style="list-style-type: none"> ☞ shorts in the electrical wiring, ☞ wire connected incorrectly or ☞ faulty switches. 	Check for electrical power at the paddle switch in "AUTO" position. If there is no power, check the conveyor control switch wiring. Look for shorts or incorrectly connected wires. (See wiring schematics in the <i>Parts Catalog</i> in this manual.)
		If the conveyor control switch wiring is OK, but there is no power to the paddle switch, replace the conveyor control switch.
		If power is available at the paddle switch, but not at the solenoid, replace the paddle switch.
-----	-----	-----
Variable Speed Conveyor Control Fails to Change Belt Speed	Faulty belt speed control valve.	Replace the valve.
-----	-----	-----
Wheels Slip or Unit Looses Power or Stops When Negotiating a Hill	Insufficient horsepower to negotiate the grade at the set speed.	Slow the machine down by moving the joystick toward neutral position.
	The unit is operating on a slope so steep that the machine can not pull the load up the hill. Operation of the joystick lever is abrupt when starting and stopping.	The multi-function valves on the pumps are set too low. Set the forward multi-function valve to 4500 PSI and the reverse multi-function valve to 2900 PSI.
		Insure that the machine hoppers are fully loaded with aggregate to achieve maximum draw bar pull.

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TROUBLESHOOTING

Problem	Cause	Solution
Wheels Slip or Unit Loses Power or Stops When Negotiating a Hill (cont.)	The unit is operating on a slope so steep that the machine cannot pull the load up the hill. Operation of the joystick lever is abrupt when starting and stopping.	When operating on steep slopes (11% or greater with a 50,000 lb truck) the truck operator will have to push going up hill and brake coming down to insure that the tires do not slip.

TROUBLESHOOTING

NOTES



CSH-173/CSH-202 CHIPSPREADER Front Wheel Drive w/4 Wheel Drive Option

SECTION 6 - PARTS BOOK

Manual Part No. 1003104

November 23, 2009

Revision A

NOTE: It is the responsibility of the customer or user's management to train, educate or supervise his employees in the proper operation and maintenance of this equipment.

ROSCO - A LeeBoy Company

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Lincolnton, North Carolina 28092

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NOTES:

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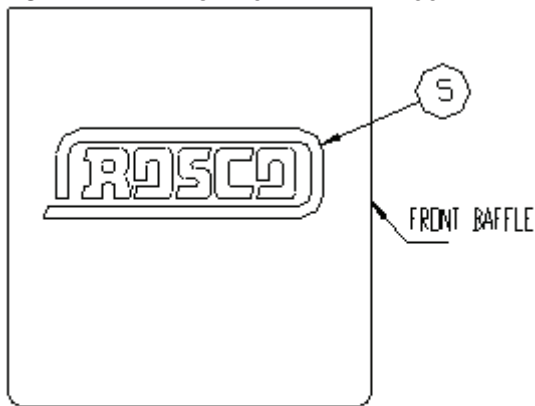
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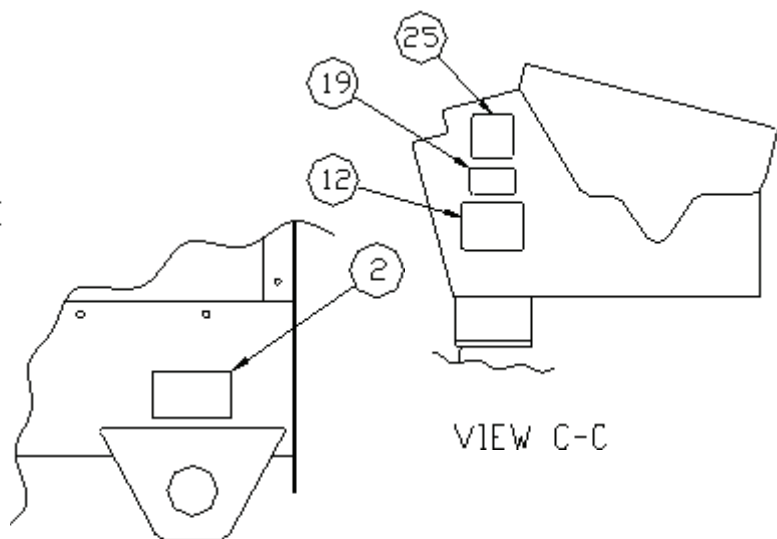
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ITEM	PART NO.	QTY	DESCRIPTION
1	004684102	14.50	STRIP,ABRASIVE,4"X60'ROLL,BLK
NS	106000110	4.00	LAGGING,CONV BELT .25X4.00X216
NS	106006161	2.00	WIPER,CONV BELT SCRAPER
NS	106008061	2.00	LINING,CHUTE .250X7.00X26.00
2	106008221	3.00	DECAL,TIE DOWN
4	306001152	2.00	DECAL,FLAHERTY
NS	33630	7.00	STRIPPING,.062
NS	33630-2	1.00	STRIPPING,.250
5	33908	2.00	DECAL,ROSCO LOGO,LARGE,BLACK
NS	34735	5.00	TRIM,STEEL CORE
NS	35355	1.00	PLATE,SERIAL NUMBER,ROSCO
6	35570	2.00	DECAL,SPRHH
7	35943	2.00	DECAL,WARNING,GUARDS
NS	35952	1.00	DECAL,SMV SIGN COVER
NS	36130	1.00	KIT,HORN,STEERING WHEEL CENTER
8	36202	2.00	DECAL,WARNING,KEEP CLEAN
NS	36898	2.00	SEAT BELT,3.00 W/HARDWARE
NS	37053	4.00	ANCHOR,STEP GRATING
NS	38956	1.00	ALARM,BACKUP,97DB
NS	40447	6.00	WASHER,2.25OD,.562IDX7GA.1793
NS	6436	1.00	STEERING WHEEL
NS	72048-01	2.00	SUSPENSION,LOW PROFILE
9	72062	2.00	DECAL,DIESEL POWER,CUMMINS
NS	72124	1.00	PULL,DRAWER,3.00,ALUM
NS	72125	1.00	GRIP,HANDLE,.125X2.75,FLAT
10	72292	2.00	DECAL,STROBE STRIP,SMALL,26.00
11	72293	2.00	DECAL,STROBE STRIP,LARGE,34.75
NS	72376	1.00	SKIRT,HOPPER BUMPER
NS	72527	2.00	SEAT,MICHIGAN,SERIES V-818
NS	72527-01	2.00	SLIDER SET,SEAT BASE



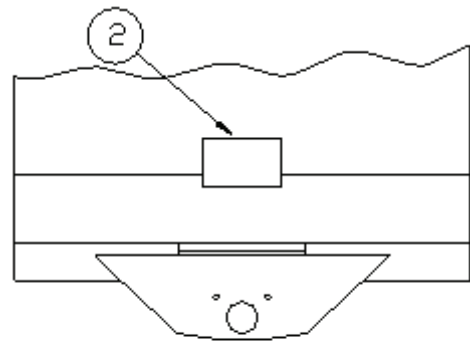
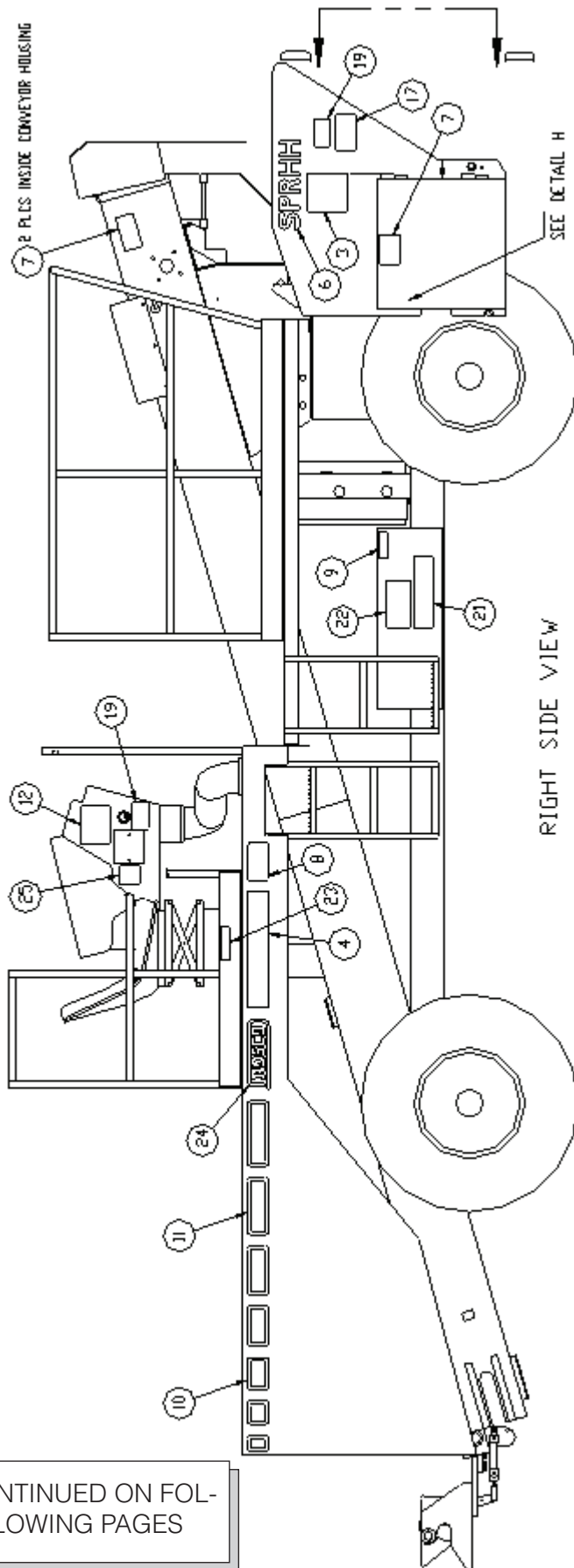
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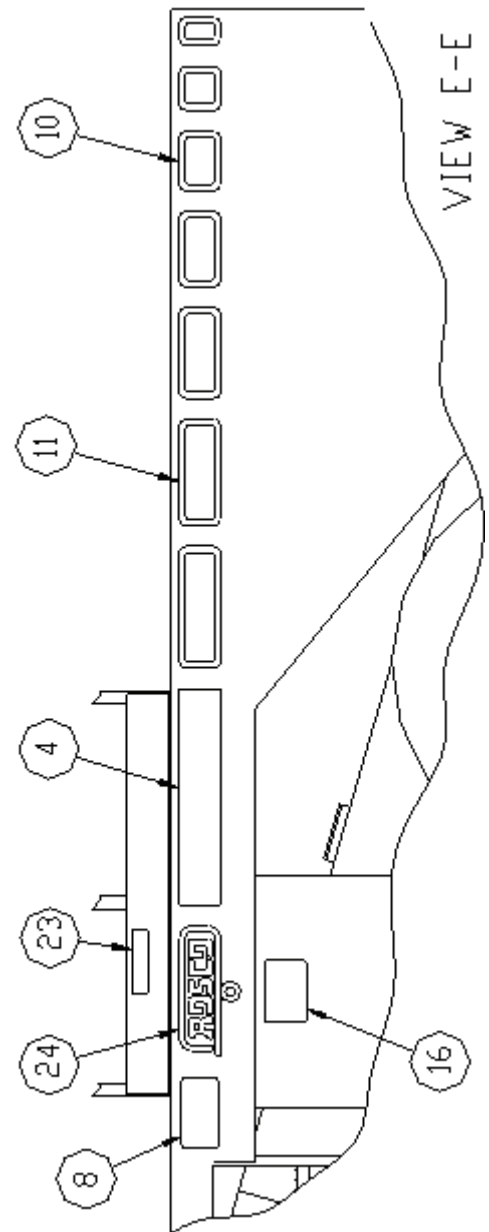
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VIEW D-D
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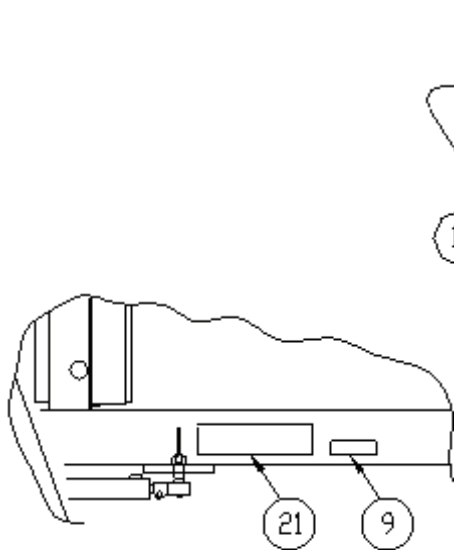


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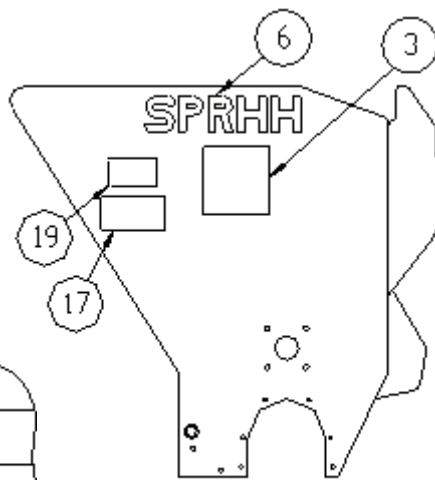
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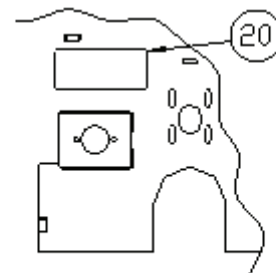
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NS	72527-02	2.00	KIT,ARM REST SET,SERIES V-818
NS	72527-03	4.00	SPACER,SEAT SLIDE,PLASTIC
12	72587	2.00	DECAL,OPERATING CAUTION
13	72589	1.00	DECAL,DIESEL FUEL
14	72590	1.00	DECAL,HOT FLUID HAZARD,WARNING
15	72591	1.00	DECAL,HYDRAULIC OIL
16	37664	1.00	DECAL,HYD OIL,SIGHT GLASS
17	72602	1.00	DECAL,DANGER,FRONT HOPPER
18	72623	1.00	DECAL,FR CONVEYOR CONTROLS
19	72624	2.00	DECAL,CAUTION,FULL HOPPER
20	72625	1.00	DECAL,GUARD MISSING,WARNING
21	72626	2.00	DECAL,ENGINE COMP,WARNING
22	72627	1.00	DECAL,WARNING,BATTERY INJURY
NS	72638	2.00	SKIRT,HOPPER SIDE,12X23.50
NS	80037	4.00	NUT,HEX,.312-18
NS	80141	4.00	WASHER,TYPE A PLAIN,.312
NS	80161	4.00	WASHER,SPLIT LOCK,.312
NS	80224	6.00	CSHH,.375-16X1.25,GR5
NS	80352	13.00	NUT,FLEXLOC,.375-16,FULL,LT
NS	80996	20.00	WASHER,SAE PLAIN,.375
NS	81089	1.00	WASHER,SAE PLAIN,1.500
NS	81133	4.00	CRG BOLT,.312-18X3.50,GR5
NS	81159	4.00	TACK,DIA.146/.104X.04 GRIP LG
NS	853521158	1.00	INDICATOR,AIR CLEANER
NS	871081000	3.00	PIN,CLEVIS,W/COTTER PIN
NS	91202	1.00	DECK SPAN,GALV,11.75WX75.00 LG
NS	951250115	1.00	KIT,HORN
NS	956011180	1.00	SIGN,SMV,METAL
23	D49	2.00	DECAL,HYDROSTATIC,SMALL,CLEAR
24	D50	2.00	DECAL,ROSCO LOGO,MEDIUM,BLACK
25	37243	2.00	DECAL,WARNING,ENGINE EXHAUST



VIEW F-F



VIEW G-G



DETAIL H

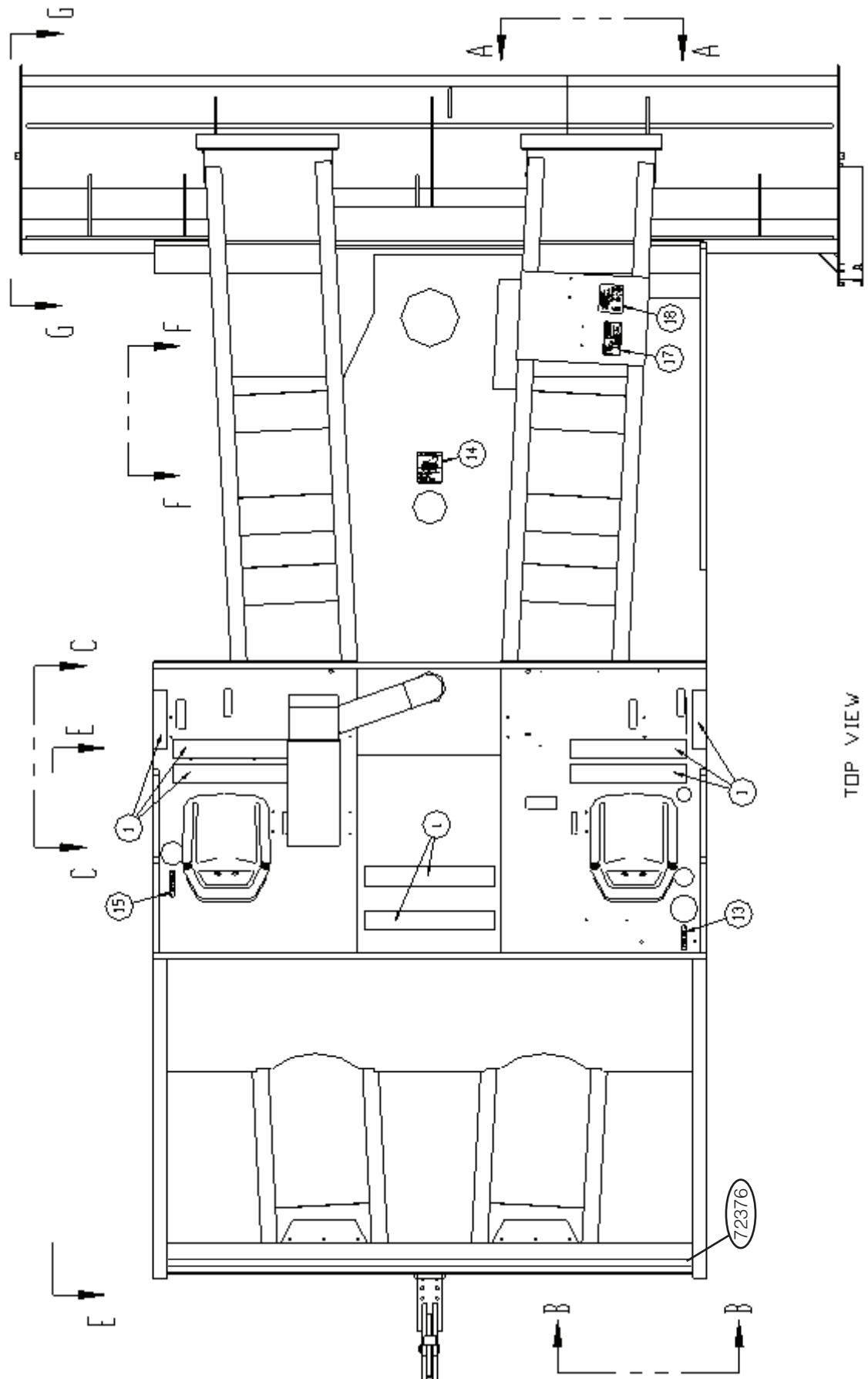
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DECAL GROUP

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CSH-173/CSH-202 CHIPSPREADER



REF: 1000370

REV:

ITEM	PART NO.	QTY	DESCRIPTION
1.....	31985.....	2.....	LIGHT, GREEN, DASH, .50 HOLE
2.....	34964.....	2.....	CIRCUIT BREAKER, 10A, PAN MT
3.....	35701.....	3.....	CIRCUIT BREAKER, 25A, PAN MT
NS.....	36085.....	3.....	RELAY, 12VDC, SPDT, 40 AMP, 5 PIN
NS.....	36086.....	3.....	BRACKET, RELAY MOUNT
6.....	36683.....	1.....	CIRCUIT BREAKER, 05A, PAN MT
7.....	39146-14.....	1.....	SWITCH, IGNITION, W/HEAT ST
8.....	72086.....	1.....	SWITCH, TOGGLE, DPDT, 2-POS
NS.....	720290.....	1.....	SOLENOID, 12V, CONSTANT DUTY
10.....	851391.....	3.....	SWITCH, TOGGLE, SPST, 2-POS
11.....	851392.....	2.....	SWITCH, TOGGLE, SPDT, 3-POS, MOM
NS.....	988697.....	1.....	CONTROLLER, CPU, PLUS 1, CSHF
13.....	988698.....	1.....	JOYSTICK, 4 BUTTON, JS6000
14.....	988707.....	1.....	SWITCH, PAD, 11 BUTTON, J1939
15.....	988882.....	1.....	DISPLAY, GRAPHIC, COLOR, CSHF
16.....	988903.....	1.....	SH, CONTROL PANEL
17.....	989956.....	1.....	DECAL, PANEL, CSHF
18.....	851090624.....	1.....	SWITCH, TOGGLE, SPDT, 2-POS
NS.....	851091608.....	1.....	FLASHER, SIGNAL

REF: 42454

REV:

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NS	010101027	6.00	SPACER,.750DX11GAX.375LG
NS	106000087	2.00	WIPER,CLIP BAR CONV
NS	106000117	2.00	STRAP,BOLTING .250X1.50X19.00
NS	106000118	1.00	STRAP,BOLTING .250X1.50X110.00
NS	106002258	2.00	CHAIN,SASH,#35 X 14 LINKS=7.84
NS	106004708	2.00	KEY,SQ,.313X1.50,BER
NS	106004790	1.00	SHAFT,1.438 X 96.50
NS	106008101	2.00	CONNECTOR, PEDAL LINK
NS	106008282	1.00	LINK,BRAKE
NS	107000058	1.00	ADJUST BAR W/M,LH
NS	107000059	1.00	ADJUST BAR W/M,RH
NS	107000060	1.00	ADJUST BAR W/M,RH
NS	107000349	3.00	DEFLECTION GUIDE
NS	307000202	2.00	W/M,CLUTCH PEDAL
NS	31878	2.00	EYE BOLT,.375-16X2.50,.75ID
NS	33277	1.00	CLAMP,HOSE,.22-.62,WORM,#04
NS	33708	1.00	TOOL BOX
NS	34180	1.00	CAP & RING ASSY
NS	34231	1.00	STRAINER,FUEL,IN FILLER NECK
NS	35370-2	1.00	SENDER,FUEL LEVEL,24.00 TANK
NS	38076	2.00	PIN,QUICK RELEASE,.25X1.7 GRIP
NS	40146	1.00	CENTER HANDRAIL,W/M
NS	40151	1.00	SHAFT,CLUTCH & BRAKE
NS	40200	1.00	FUEL TANK W/M,50 GAL,LOCKABLE
NS	40447	8.00	WASHER,2.250D,.562IDX7GA.1793
NS	40533	1.00	SUPPORT,SOUND SHIELD
NS	40641	1.00	W/M,BAFFLE,FRONT HEAD,RH
NS	40642	1.00	W/M,BAFFLE,FRONT HEAD,LH
NS	40724	2.00	HOPPER PIN W/M
NS	41024	1.00	DECK,CENTER,CONTROL
NS	42448	1.00	PEDAL,BRAKE,SHORT
NS	80211	2.00	CSHH,.312-18X1.75,GR5
NS	80351	2.00	NUT,FLEXLOC,.312-18,FULL,LT
NS	80406	2.00	CSHH,.375-16X2.25,GR5
NS	80845	2.00	COTTER PIN,.312X3.50
NS	845202026	4.00	BEARING,PILLOW BLOCK
NS	845292019	3.00	BRG,1.44,2-BOLT FLANGE
NS	871090324	2.00	SPR,1.062 DIA X 8.24 PSI
NS	871111605	20.00	CLAMP,LOOP,.50 OD PLSTC COVER
NS	871111609	40.00	CLAMP,LOOP,.625 OD,PLSTC COVER
NS	971100714	1.00	CLEVIS,.50-20 UNF
NS	99293	1.00	PIPE,PLUG,1.50MP,SQ HD,MI
NS	99534	1.00	PIPE,PLUG,02MP,SQ HD,MI
NS	99535	1.00	PIPE,PLUG,04MP,SQ HD,MI
NS	99537	1.00	PIPE,PLUG,08MP,SQ HD,MI
NS	99537	1.00	PIPE,PLUG,08MP,SQ HD,MI

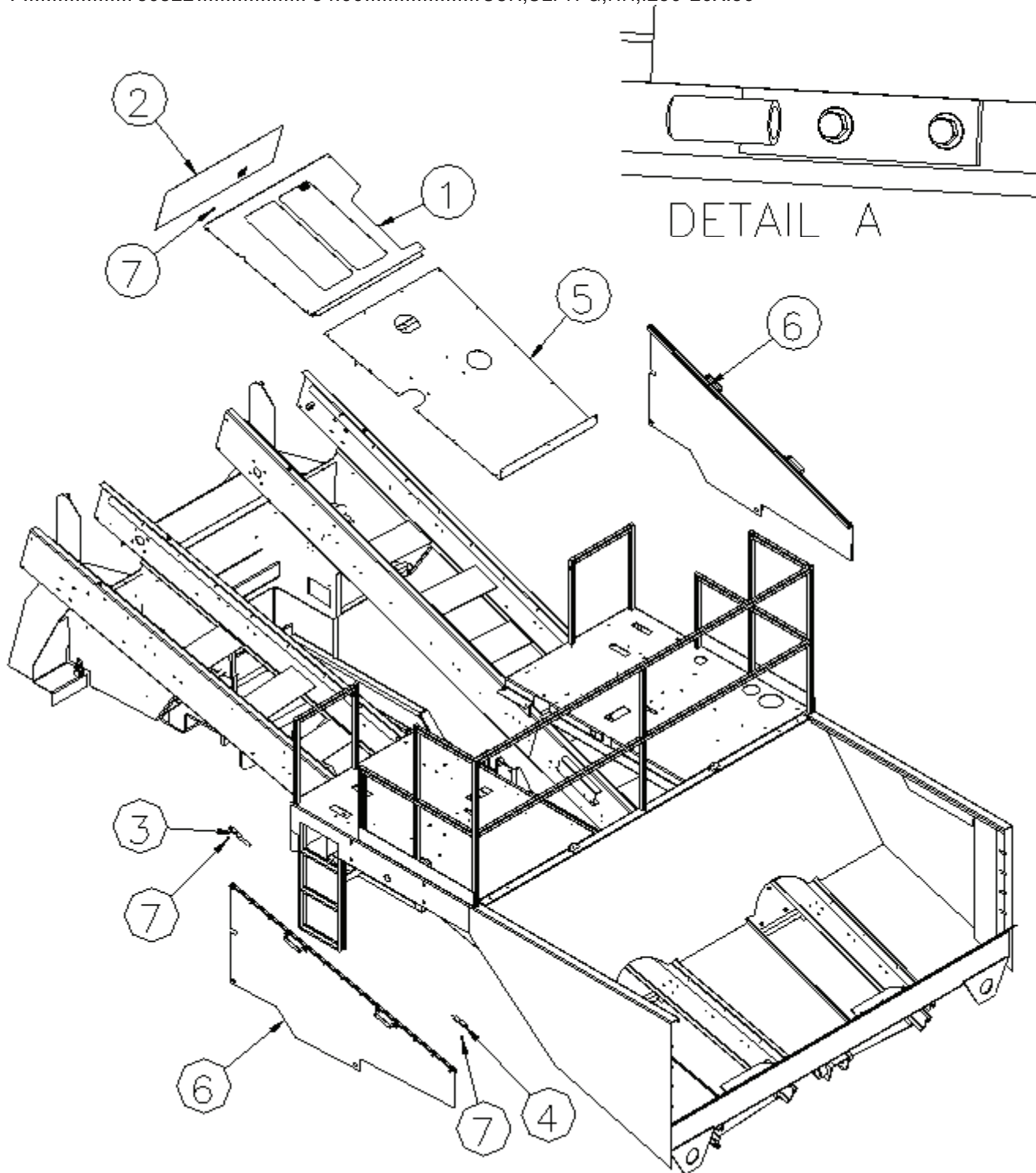
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0	33964.....	1.00	SWITCH,STOP LAMP
0	33435.....	5.00	LIGHT & SOCKET,12V,2.00 GAUGE
0	40899.....	2.00	BRACKET,HEADLAMP & TURN SIGNAL
0	6161	2.00	LIGHT,TURN SIGNAL,AMBER
0	72318.....	2.00	LAMP,HALOGEN,FLOOD,80X30 DEG
0	80038.....	4.00	NUT,HEX,.375-16
0	80162.....	4.00	WASHER,SPLIT LOCK,.375
0	80221.....	4.00	CSHH,.375-16X1.00,GR5
0	80322.....	28.00	SCR,SLFTPG,HH,.250-20X.50
0	851091608.....	1.00	FLASHER,SIGNAL
0	851342007.....	2.00	LIGHT,TURN/BRAKE,RED

REF: 42122
 REV: A

ITEM	PART NO.	QTY	DESCRIPTION
1	42138	1.00	W/M,ENG COVER,14 GA, TOP FRONT
2	42156	1.00	GRILL,AIR IN,18 GA 3/16RND,FRT
3	41516	2.00	MOUNT,CURTAIN,UPPER
4	41515	2.00	MOUNT,CURTAIN,LOWER
5	1002242	1.00	W/M,ENG COVER,14 GA, TOP REAR
6	42275	2.00	ASSY,ENG CURTAIN,SPRHH-F
7	80322	34.00	SCR,SLFTP,HH,.250-20X.50

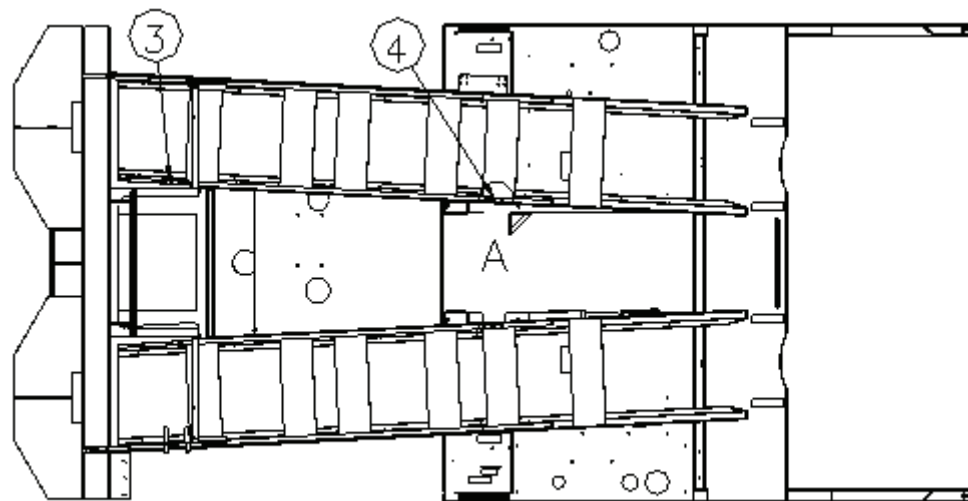
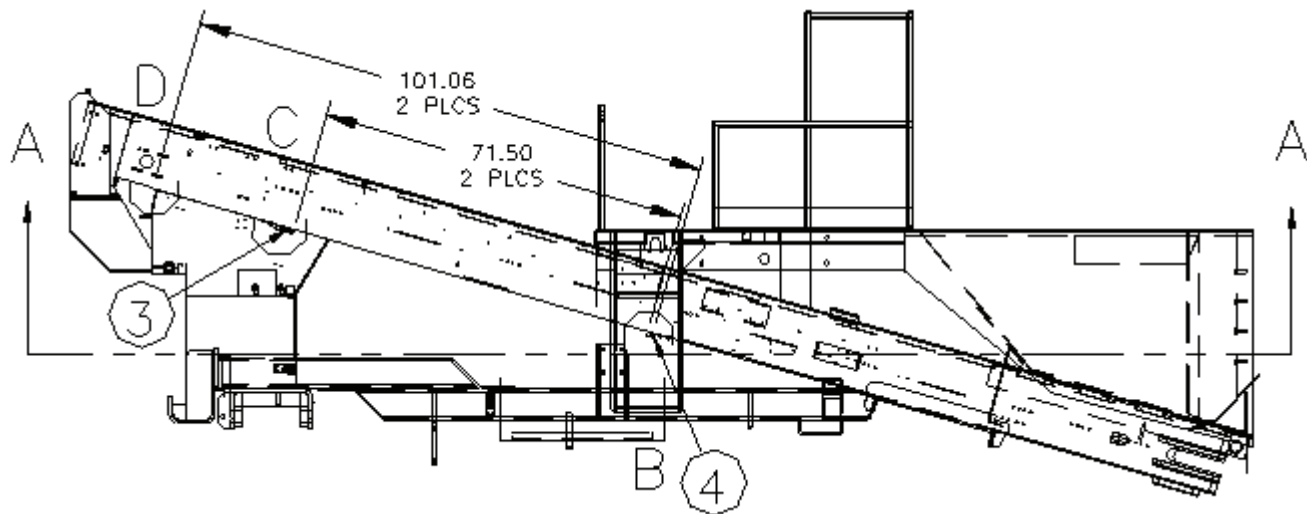


ENGINE COVER

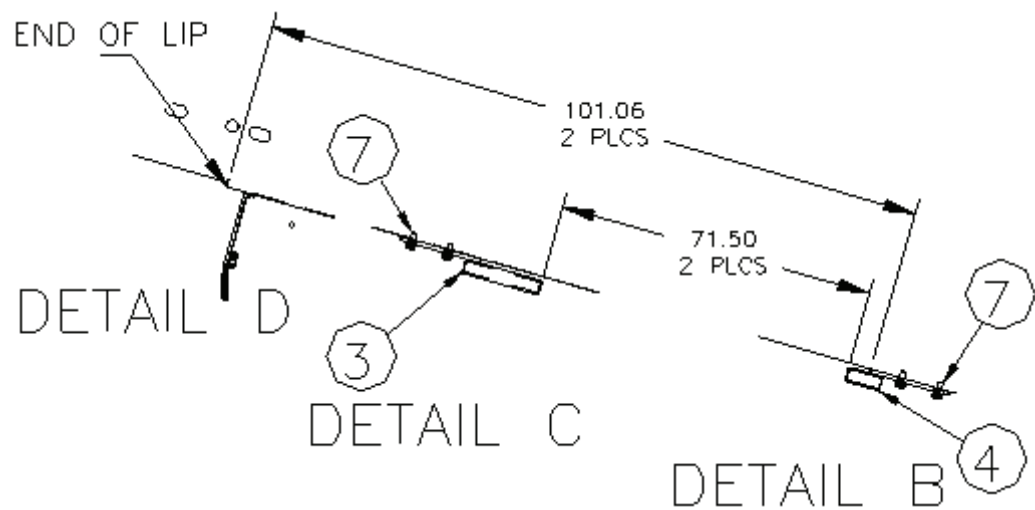
CSH-173/CSH-202 CHIPSPREADER

REF: 42122

REV: A



SECTION A-A



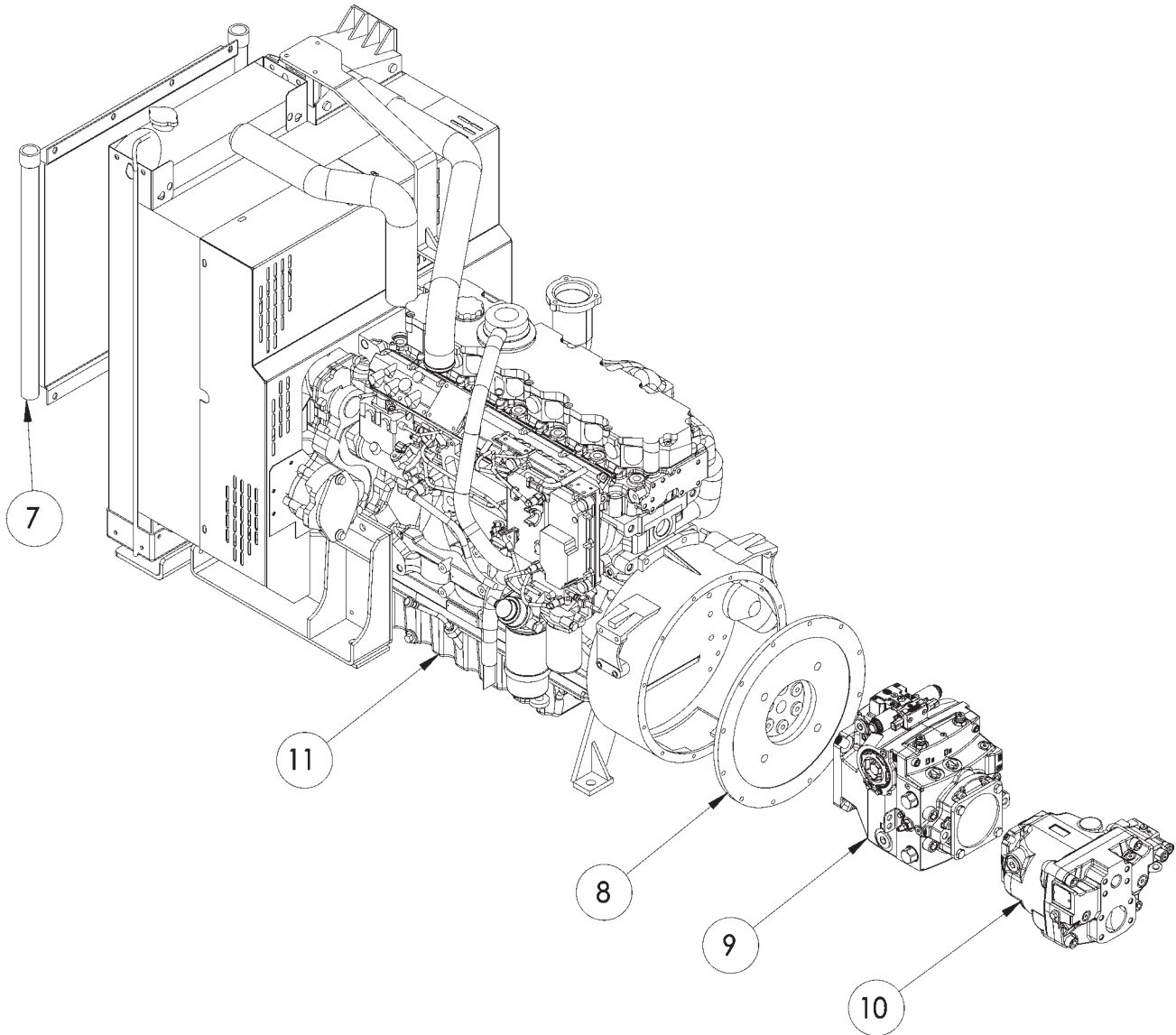
REF: 42452

REV: 0

ITEM	PART NO.	QTY	DESCRIPTION
NS	007020096	2.00	HOOK,RUBBER
NS	007020097	2.00	BRACKET,ANCHOR
NS	007020098	2.00	BRACKET,HOOD
NS	33162	2.00	CLAMP,HOSE,.44-.78,WORM,#06
NS	33365	1.00	FITT,90 04MP-06HB,CRIMPED
NS	33491	1.00	FITT,STR 04MP-05HB,CRIMPED
NS	34735	3.79	TRIM,STEEL CORE
NS	38579	5.00	HOSE,06,LOW PRESS PUSH ON
NS	41591	1.00	W/M,COVER,BATTERY BOX
NS	70437	2.00	BATTERY BOOT,POS(RED)
NS	71812	9.00	HOSE,05,PUSH-ON,.3125
NS	72313	2.00	HOLD DOWN,BATTERY
NS	73077	2.00	WASHER,BATTERY COROSION,RED
NS	73078	2.00	WASHER,BATTERY COROSION,GREEN
NS	80036	1.00	NUT,HEX,.250-20
NS	80141	2.00	WASHER,TYPE A PLAIN,.312
NS	80350	1.00	NUT,FLEXLOC,.250-20,FULL,LT
NS	80351	4.00	NUT,FLEXLOC,.312-18,FULL,LT
NS	80393	4.00	CSHH,.375-16X9.50,GR5
NS	80830	2.00	CRG BOLT,.312-18X.75,GR5
NS	80938	1.00	EYE BOLT,.250-20X1.00X.75ID
NS	871111605	2.00	CLAMP,LOOP,.50 OD PLSTC COVER
NS	99448	2.00	PIPE,BUSH,06MP-04FP,STL

REF: 1002787
 REV: 0

ITEM	PART NO.	QTY	DESCRIPTION
1.....	33146-6.....	2.....	BATTERY,12V,1000 CRK AMPS
2.....	36339.....	1.....	CABLE,BATTERY,NEG,17",EYE/EYE
3.....	41591.....	1.....	W/M,COVER,BATTERY BOX
4.....	70437.....	2.....	BATTERY BOOT,POS(RED)
5.....	72136.....	1.....	CABLE,BATTERY,POS,60",EYE/POST
6.....	72313.....	1.....	HOLD DOWN,BATTERY
7.....	72722.....	1.....	COOLER,HYD OIL
8.....	988693.....	1.....	DRIVE,PUMP,SAE D,27 TOOTH
9.....	988694.....	1.....	PUMP,HYD,H1,10.06 CIR,AUX C
10.....	988695.....	1.....	PUMP,HYD,ER100,6.10 CIR
11.....	989825.....	1.....	ENGINE,CAT,202HP,TIER 3
12.....	R442.....	1.....	CABLE,BATTERY,NEG,14",EYE/POST



LB024

REF: 72773, 73033

REV: 0

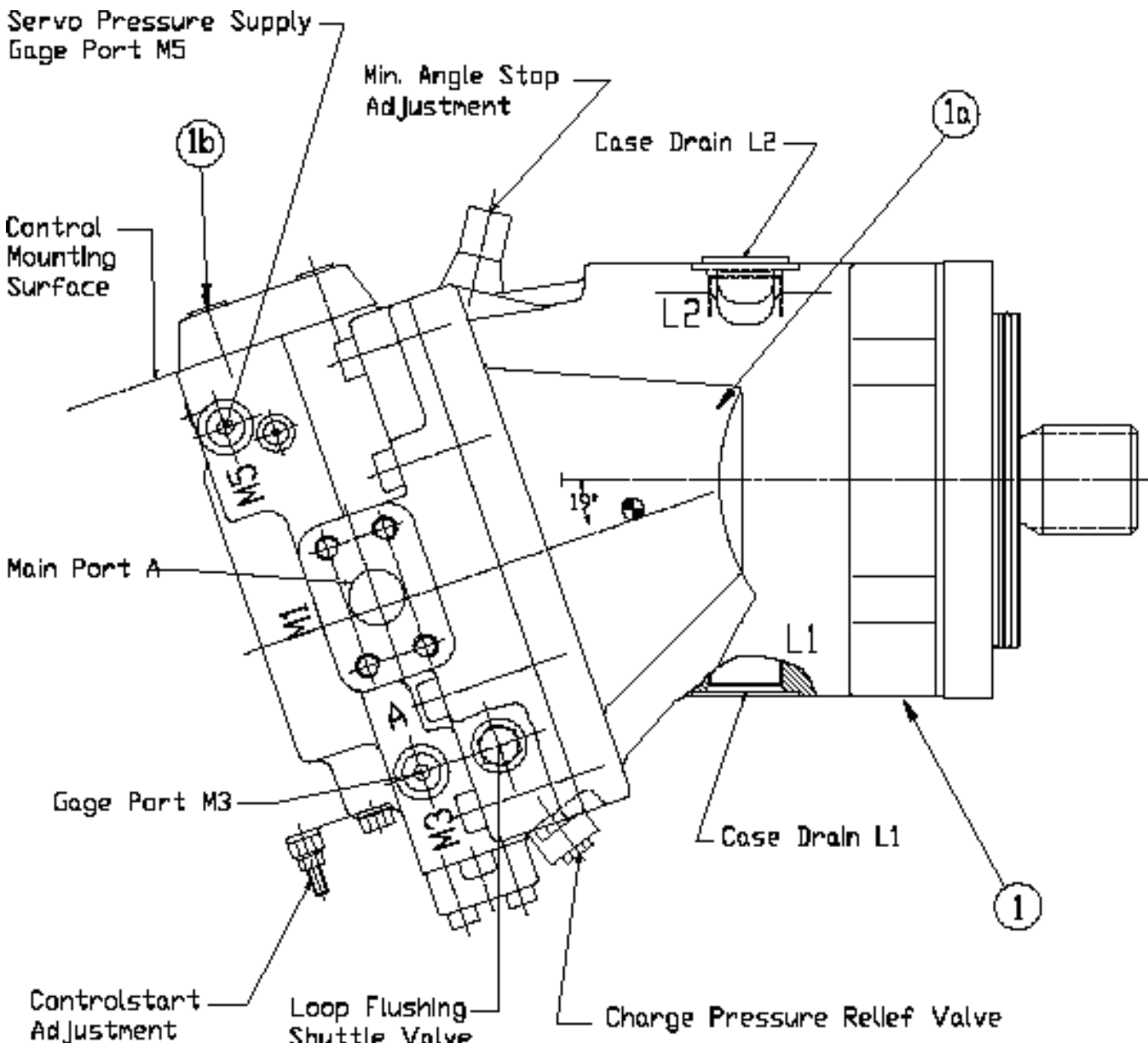
ITEM	PART NO.	QTY	DESCRIPTION
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ALL UNITS

1	72773	2.00	MOTOR, HYD, 9.82/5.85 CIR, W/PICK
1a	72773-01	1.00	KIT, SEAL, SHAFT, 51 SERIES, 160 CC
1b	72773-110	1.00	CONTROL, 2-SPEED

4-WHEEL-DRIVE UNIT ONLY

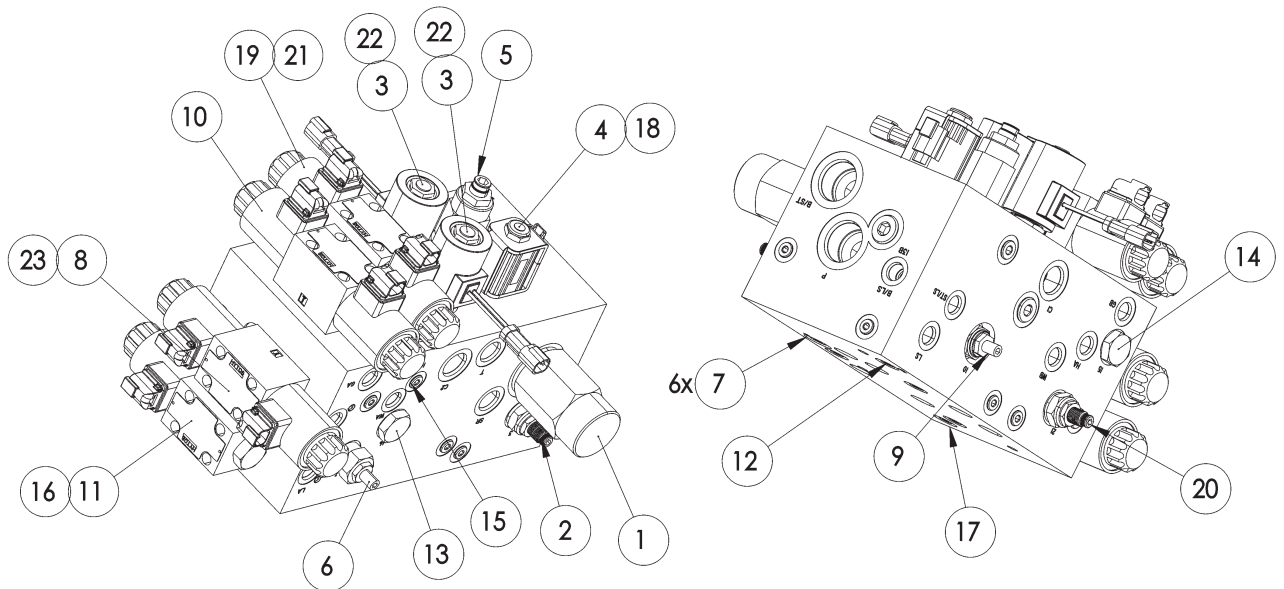
1	73033	2.00	MOTOR, HYD, 3.66/.73 CIR
1a	73033-01	1.00	KIT, SEAL (OVERHAUL) 60 CC
1b	73033-110	1.00	SOLENOID, 2-SPEED, 60CC, 51 SERIES



REF: 988696

REV:

ITEM	PART NO.	QTY	DESCRIPTION
1	988696-01	1	VLV,PRIOTY FLOW DIVIDER
2	988696-02	1	VLV,RELIEF,2200 PSI
3	988696-03	2	VLV,PROP,PRESS COMP
4	988696-04	1	VLV,SOLENOID,2-WAY,NC
5	988696-05	1	VLV,FLOW CONTROL,PC
6	988696-06	1	VLV,FLOW REQUATOR,ADJ
7	988696-07	6	VLV,CHECK
8	988696-08	1	VLV,DO3,DIR CONTROL,12V
9	988696-09	1	VLV,PRESS RED/RELIEVING
10	988696-10	1	VLV,DO3,DIR PROPORTIONAL
11	988696-11	1	VLV,DO3,DIR CONTROL,12V
12	988696-12	2	VLV,SHUTTLE
13	988696-13	1	VLV,CHECK,PILOT TO OPEN
14	988696-14	1	VLV,CHECK,5 PSI SPRING
15	988696-15	1	ORIFICE,REMOVABLE,.060
16	988696-16	1	ORIFICE,DO3,.098
17	988696-17	11	ORIFICE,REMOVABLE,.030
18	988696-18	1	COIL,12 VDC,W/DEUTSCH PIN
19	988696-19	1	VLV,DO3,DIR CONTROL,12V
20	988696-20	1	VLV,RELIEF,500 PSI
21	988696-21	1	ORIFICE,DO3,.039
22	988696-22	2	COIL,LEADWIRE,12VDC
23	988696-23	1	ORIFICE,DO3,.059



LB025

REF: 1000369

REV:

ITEM	PART NO.	QTY	DESCRIPTION
Hydraulic System:			
7	38013	1	VALVE,CHECK,.750 NPT,25 PSI
10	72773	1	MOTOR,HYD,9.82/3.54 CIR
11	73220	3	MOTOR,HYD,15.5 CIR
12	900135	1	MICRO SWITCH, AUTO. AUGERS
13	988696	1	VLV,HYD,LOAD SENSING
14	988708	1	VLV,HYD,STEER,17.9CIR,LOAD SEN
15	988709	1	CYL,HYD,2.50BX6.00S,W/SENSOR
16	989807	2	CYL,HYD,2.50X8.00X1.25 ROD
19	989940	1	VLV,HYD,PRESS RED,CSHF
Hydraulic Reservoir and Sight Glass:			
1	33148	1	STRAINER,SUCT,2NPT,25GPM,100ME
2	35368	1	SENDER,TEMP GAUGE,04 MP
3	37680	1	CAP W/STRAINER,HYD FILLER
4	500070	1	GAUGE,SIGHT LEVEL/TEMP,HYD OIL
5	72543	1	FILTER ASSY,HYD RETURN
	38327-01	1	ELEMENT,HYD,FILTER,50 GPM
6	989932	1	W/M,HYD TANK,50 GAL,CSHF
7	989939	1	STRAINER,SUCTION,100 GPM,100 M
8	X259	1	FILTER ASSY,HYD,DELUXE III
	X260	1	ELEMENT,HYD FILTER,25 GPM
9	1003069	1	FILTER,HYD,35 GPM,500PSI,W/SW
9A	1003069-01	1	ELEMENT,HYD FILTER,35 GPM

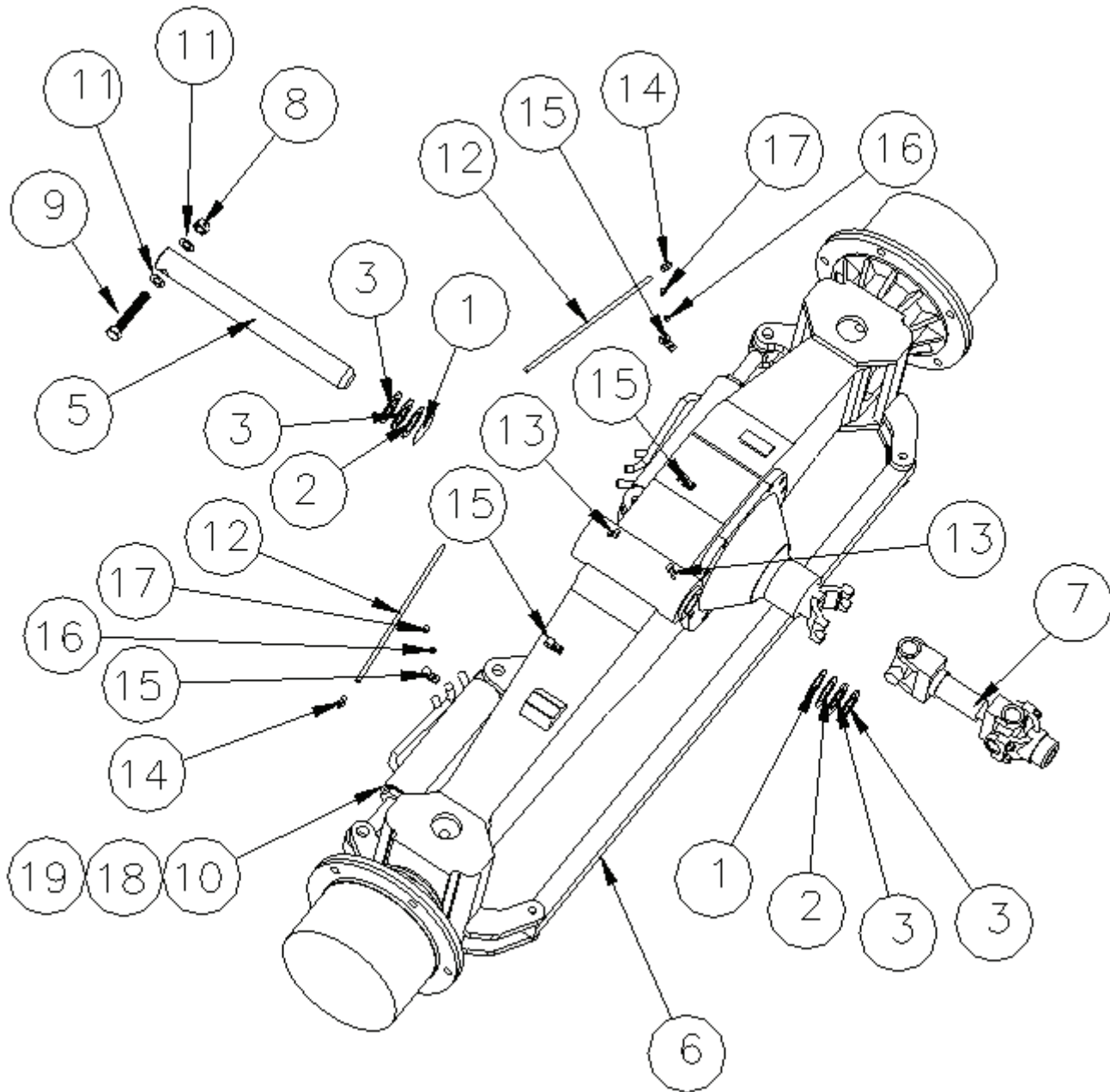
FRONT AXLE GROUP

CSH-173/CSH-202 CHIPSPREADER

REF: 42084
REV: B

ITEM	PART NO.	QTY	DESCRIPTION
1.....	38180.....	2.00.....	WASHER,THRUST,2.00IDX.03THICK
2.....	38180-01.....	2.00.....	WASHER,THRUST,2.00IDX.06THICK
3.....	38180-02.....	4.00.....	WASHER,THRUST,2.00IDX.13THICK
4.....	38182-01.....	5.00.....	OIL,HYD,MOBIL 424
5.....	41396.....	1.00.....	SHAFT,PIVOT,FRONT AXLE
6.....	72785.....	1.00.....	AXLE,DRIVE/STEER,77.50 TRACK
7.....	73173.....	1.00.....	DRIVE SHAFT,1480,11.50 CL
8.....	80357.....	1.00.....	NUT,FLEXLOC,.750-10,FULL,LT
9.....	80838.....	1.00.....	CSHH,.750-10X4.50,GR5
10.....	72785-01.....	1.00.....	CYL,HYD,2.36BX1.18ROD,METRIC
.....	72785-02.....		KIT,SEAL,HYD CYL
.....	72785-09.....		KIT,BRAKE REPAIR,ITL AXLE
.....	72785-17.....		WHEEL NUT
11.....	81154.....	2.00.....	WASHER,SAE,HARDENED,.750
12.....	71952.....	2.00.....	HOSE ASSY 3000 PSI,-03 X 22
13.....	99523.....	2.00.....	PIPE,90,02MP-02FP,MI
14.....	72660.....	2.00.....	FITT,LUBE,STR,02FP
15.....	8711111605.....	5.00.....	CLAMP,LOOP,.50 OD PLSTC COVER
16.....	80476.....	4.00.....	WASHER,SPLIT LOCK,M6
17.....	80465.....	4.00.....	CSHH,M6X1.0X12,CL8.8
18.....	80478.....	4.00.....	WASHER,SPLIT LOCK,M10
19.....	80515.....	4.00.....	CSHH,M10X1.5X25,CL8.8
20.....	42271.....	1.00.....	BRACKET,CABLE CLAMP
21.....	80423.....	1.00.....	CSHH,.250-20X.50,GR5
22.....	80036.....	1.00.....	NUT,HEX,.250-20
23.....	80160.....	1.00.....	WASHER,SPLIT LOCK,.250
24.....	72984-010.....	2.00.....	HOSE,03,04FJX-M12X1,3000

REF: 42084
 REV: B



FILL WITH MOBIL FLUID 424, ITEM 4,
 HOUSING & HUBS. CAP 4.68 GAL
 HOUSING & .44 GAL EACH HUB.
 NOTE: DO NOT USE MOBIL 424
 IN BRAKE RESERVOIR. USE
 ONLY MOBIL DTE 11M. DO
 NOT USE ORDINARY BRAKE
 FLUID (J 1703).

REF: 42293, 42296
 REV: 0

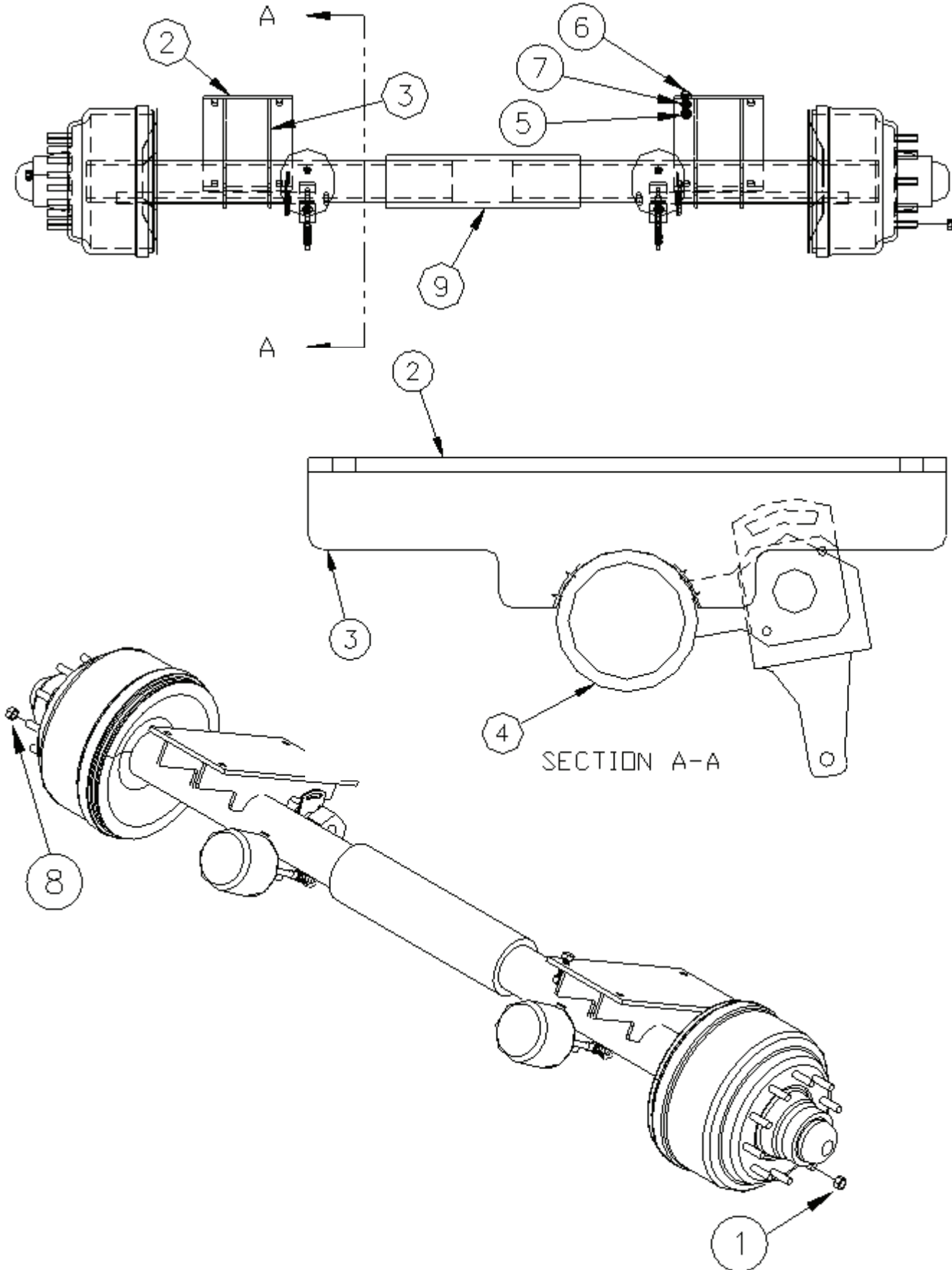
ITEM	PART NO.	QTY	DESCRIPTION
1	42296	1.00	GRP,REAR AXLE,FRT 2WD (See Detail Below)
2	72372	1.00	FITT,PLUG 02PD,DUST
3	72702	1.00	FITT,TEST 02MP-02PD
4	73230	2.00	ACTUATOR,BRAKE,HYD
5	73233	1.00	VLV,HYD,DUAL SOL,PRES RED



42296 REAR AXLE, FRT 2WD (Drawing Following)

1	33462	10.00	NUT,LUG,.750-16,LH
2	42297	2.00	BASE, AXLE MOUNT
3	42298	4.00	GUSSET, AXLE MOUNT
4	72769	1.00	AXLE,TRAILER,96",22,500#
5	80357	8.00	NUT,FLEXLOC,.750-10,FULL,LT
6	81114	8.00	CSHH,.750-10X2.50,GR8
7	81154	8.00	WASHER,SAE,HARDENED,.750
8	846171807	10.00	NUT,LUG,.750-16
9	90965-01	1.00	TUBE,RND,6.50 ODX.75W,24.00 LG

REF: 42296
REV: 0



REF: 42082

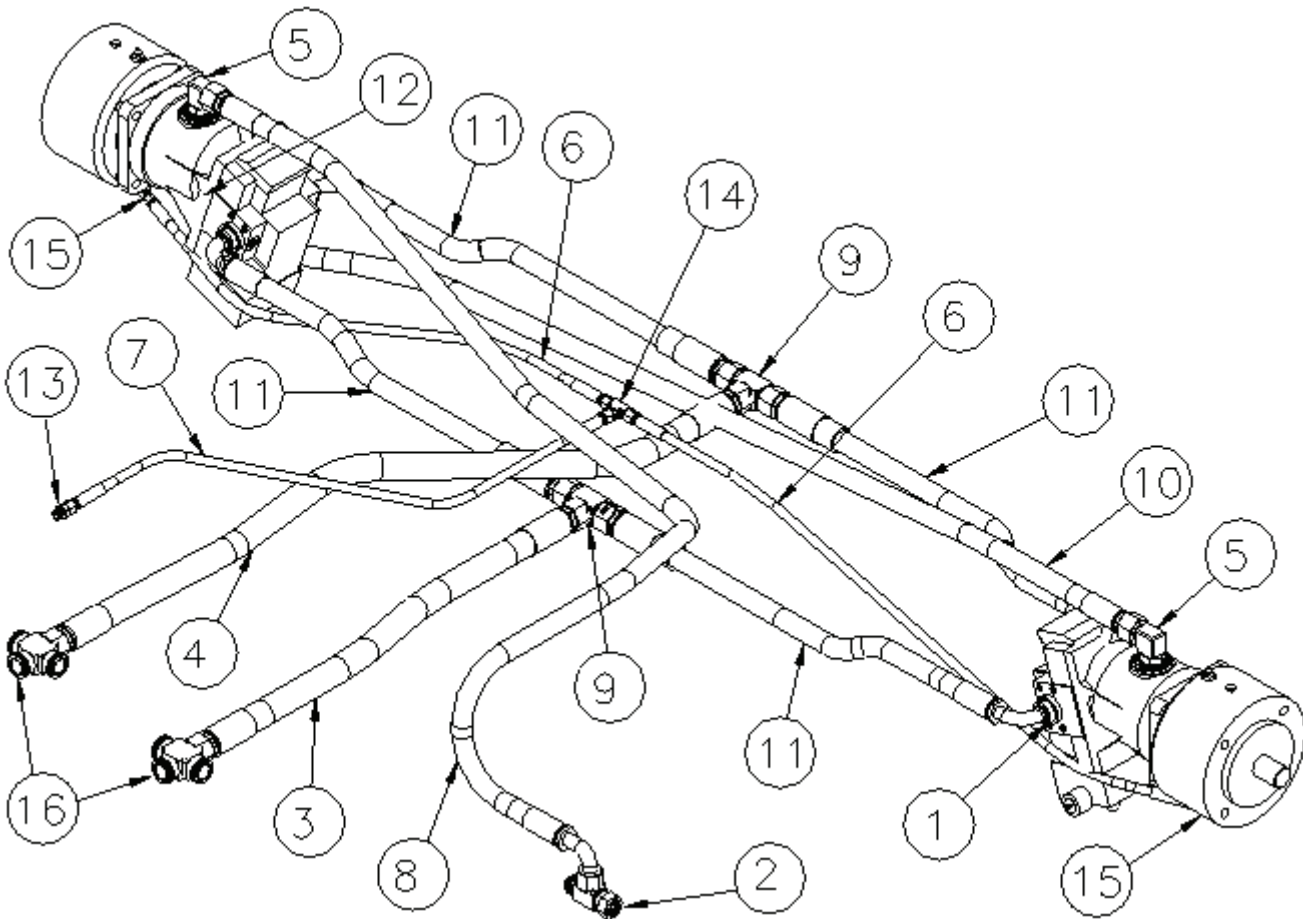
REV: A

ITEM	PART NO.	QTY	DESCRIPTION
NS	40212	2.00	MOUNT, HYD MOTOR
NS	40213	2.00	GUARD, HYD MOTOR
NS	40220	2.00	CHANNEL W/M, AXLE HSG
See Detail ...	73196	1.00	KIT, HOSE/FITT, REAR DRIVE MTRS
2	73067	8.00	CSSH, .500-13X6.00, GR8
3	73215	2.00	HUB, TORQUE, 23.50:1 RATIO (Detail Following)
5	72685	3.00	CONN, METRIC 4-PIN
6	73033	2.00	MOTOR, HYD, 3.66/.73CIR
9	73040	2.00	BRAKE, HYD, WET, 5400 LB
10	73041	1.00	VLV, HYD, SOL, 3-WAY, NO, -06
13	80280	36.00	CSSH, .625-11X1.50, GR5
14	80357	8.00	NUT, FLEXLOC, .750-10, FULL, LT
15	81114	8.00	CSSH, .750-10X2.50, GR8
16	81141	8.00	WASHER, SAE, HARDENED, .500
17	81154	8.00	WASHER, SAE, HARDENED, .750
18	81201	36.00	WASHER, SAE, HARDENED, .625
19	846171807	20.00	NUT, LUG, .750-16
20	99534	2.00	PIPE, PLUG, 02MP, SQ HD, MI
23	73084	2.00	FITT, RELIEF, 02MP, 5 PSI
25	80195	2.00	CSSH, .250-20X1.75, GR5
26	80140	2.00	WASHER, TYPE A PLAIN, .250
27	80160	2.00	WASHER, SPLIT LOCK, .250
28	80036	2.00	NUT, HEX, .250-20
30	80219	8.00	CSSH, .375-16X.75, GR5
31	80162	8.00	WASHER, SPLIT LOCK, .375

REF: 73196

REV: 0

ITEM	PART NO.	QTY	DESCRIPTION
0	RES1001	.00	HYDRAULIC SPECIFICATIONS
1	33103	4.00	FITT,KIT 12FL, CODE 62
2	33160	1.00	FITT,TEE 12MJ-12FJX-12MJ
3	38730-041	1.00	HOSE,16,160FS-160FS,6000
4	38730-049	1.00	HOSE,16,160FS-160FS,6000
5	71775	2.00	FITT,90 12MJ-12MB
6	72415-044	2.00	HOSE,04,04FJX-06FJX,3000
8	72558-118	1.00	HOSE,12,12FJX-12RJ90,1250
9	72942	.00	FITT,TEE 16MRS-16MRS-16MRS
10	72558-085	1.00	HOSE,12,12FJX-12RJ90,1250
11	73101-033	4.00	HOSE,12,160FS-12FH9B,6000
12	853180160	1.00	FITT,STR 12MJ-12MB
15	X360	2.00	FITT,90 04MJ-04MB
17	73036	2.00	FITT,CROSS 16MRS
18	X365	1.00	FITT,90 12MJ-12FJX



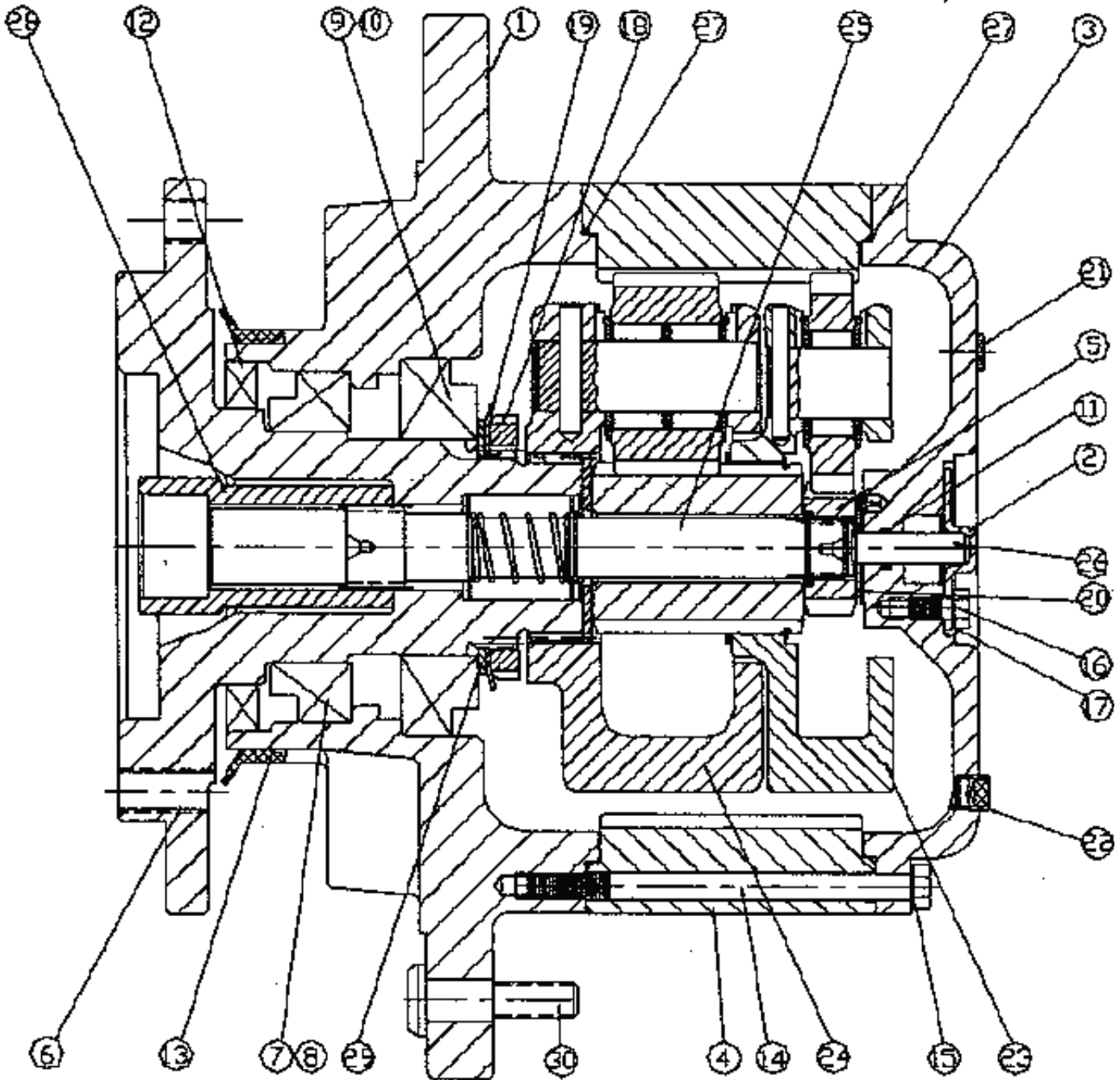
REF: 73215

REV:

ITEM	PART NO.	QTY	DESCRIPTION
1	73215-01	1.00	HOUSING,OMNI GEAR
2	73215-02	1.00	CAP,LOCKOUT,OMNI GEAR
3	73215-03	1.00	CAP,END,OMNI GEAR
4	73215-04	1.00	GEAR,RING,79T,OMNI GEAR
5	73215-05	1.00	GEAR,SUN 20T,OMNI GEAR
6	73215-06	1.00	SPINDLE,SAE 'C2',OMNI GEAR
7	73215-07	1.00	BEARING CUP,OMNI GEAR
8	73215-08	1.00	BEARING CONE,OMNI GEAR
9	73215-09	1.00	BEARING CUP,OMNI GEAR
10	73215-10	1.00	BEARING CONE,OMNI GEAR
11	73215-11	1.00	O-RING,OMNI GEAR
12	73215-12	1.00	OIL SEAL,OMNI GEAR
13	73215-13	1.00	PROTECTOR SEAL,OMNI GEAR
14	73215-14	12.00	HEX HEAD BOLT,M10X1.5,GR.10.9,OMNI
15	73215-15	12.00	LOCK WAHER,M10,OMNI GEAR
16	73215-16	2.00	HEX HEAD BOLT,M8X1.25,GR.10.9,OMNI
17	73215-17	2.00	LOCK WASHER,M8,OMNI GEAR
18	73215-18	1.00	LOCK NUT,M75X2,OMNI GEAR
19	73215-19	1.00	LOCK NUT WASHER,M75,OMNI GEAR
20	73215-20	1.00	RETAINING WASHER,SUN,OMNI GEAR
21	73215-21	1.00	PIPE PLUG,1/4"-18NPT SOCKET,HD,OMNI
22	73215-22	1.00	PIPE PLUG,1/2"-14NPT,MAGNETIC,OMNI
23	73215-23	1.00	PRIMARY CARRIER,SUB ASSY,OMNI
24	73215-24	1.00	SECONDARY CARRIER,SUB ASSY,OMN
25	73215-25	1.00	DRIVE SHAFT SUB ASSY,OMNI GEAR
26	73215-26	1.00	PLUNGER,OMNI GEAR
27	73215-27	2.00	O-RING,OMNI GEAR
28	73215-28	1.00	MOTOR COUPLER,14T,OMNI GEAR
29	73215-29	1.00	SPACER,FLAT TONGUE,OMNI GEAR
30	73215-30	10.00	WHEEL STUD,3/4"-16UNF-2A,OMNI

REF: 73215

REV:



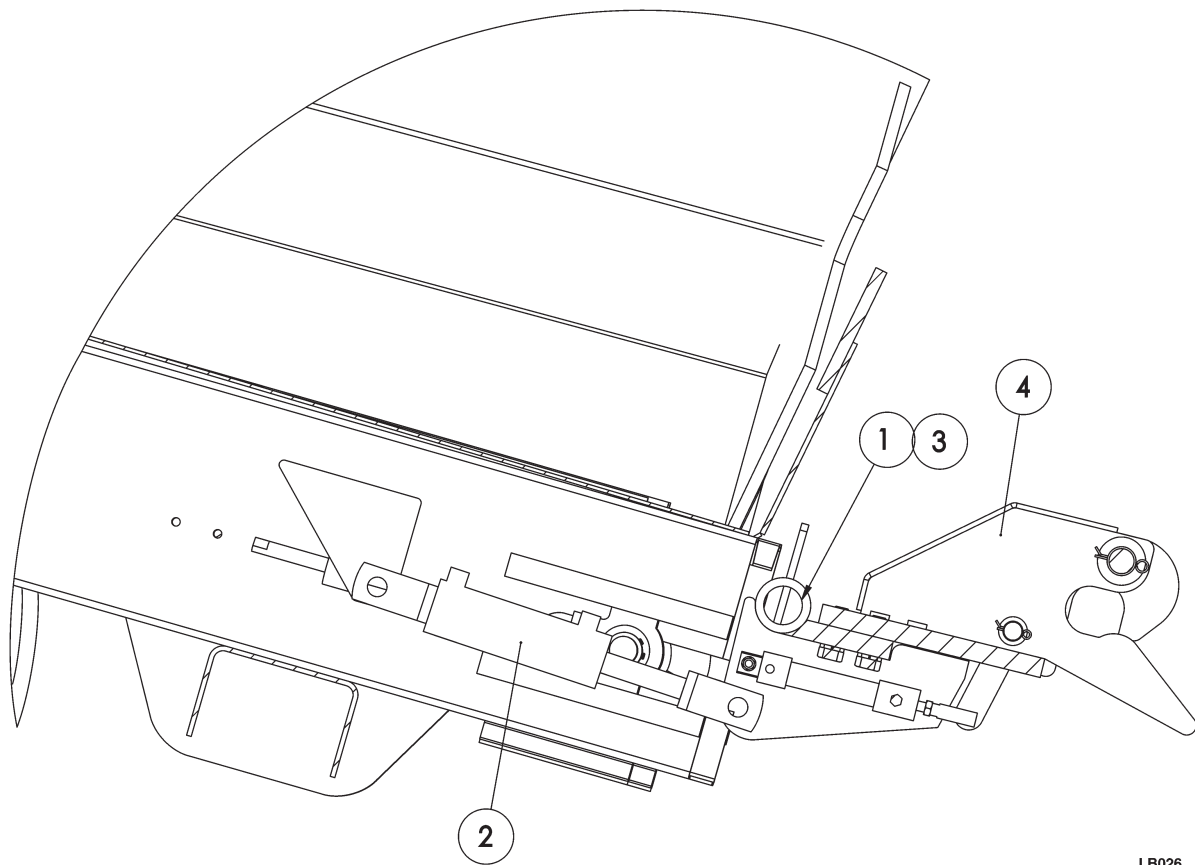
REF: 1002788

REV: B

ITEM	PART NO.	QTY	DESCRIPTION
1	106000690	1	SHAFT,TRUCK HOOK
2	31884A	1	CYL,HYD,2.50X6.00X1.125 ROD
3	871045703	1	SET SCREW,.500-13X.500
4	988896	1	GRP,HITCH,TRUCK
5	40541	1	LATCH,HOOK
6	40543	1	PIN,HOOK,1.50 OD
7	40549	1	PIN,LATCH,1.00 OD
8	40984	1	HOOK,HD TRUCK HITCH
9	41180	1	W/M,BASE,HD HITCH
10	71621	1	CSHH,.375-16X2.75,GR5
11	71641	4	CSHH,.750-10X2.25,GR5
12	72526	1	CYL,HYD,1.00X3.00X.500 ROD
13	72528	1	BALL JOINT,.500,FEMALE,W/STUD
14	80058	1	NUT,HEX,.500-20
15	80093	1	NUT,HEX,JAM,.500-20
16	80164	1	WASHER,LOCK,.500
17	80168	4	WASHER,LOCK,.750
18	80336	2	PIN,COTTER,.188X1.50
19	80338	2	PIN,COTTER,.188X2.00
20	80352	1	NUT,FLEXLOC,.375-16,FULL,LT
21	80996	1	WASHER,FLAT,SAE,.375
22	81089	4	WASHER,FLAT,SAE,1.500
23	851644	1	BREATHER,TRACK TENSION CYL
24	871111605	3	CLAMP,INSULATED BAND,1/2"
25	988897	1	W/M,TRUCK HITCH
26	R48-1	4	WASHER,SHIM,1.031X1.50X.062
9	41239	1.00	HITCH,HYD RELEASE,SMALL (Detail Following)
	72536-01		KIT,SEAL,HYD CYL
10	80038	8.00	NUT,HEX,.375-16
11	80040	4.00	NUT,HEX,.500-13
12	80162	8.00	WASHER,SPLIT LOCK,.375
13	80221	8.00	CSHH,.375-16X1.00,GR5
14	845202026	2.00	BEARING,PILLOW BLOCK
15	871045703	1.00	SET S,.50DOG,.500-13X.50
16	871081000	4.00	PIN,CLEVIS,W/COTTER PIN
17	871090326	2.00	SPR,177WIRE,1.38OD,39CL,8.75LG

REF: 1002788

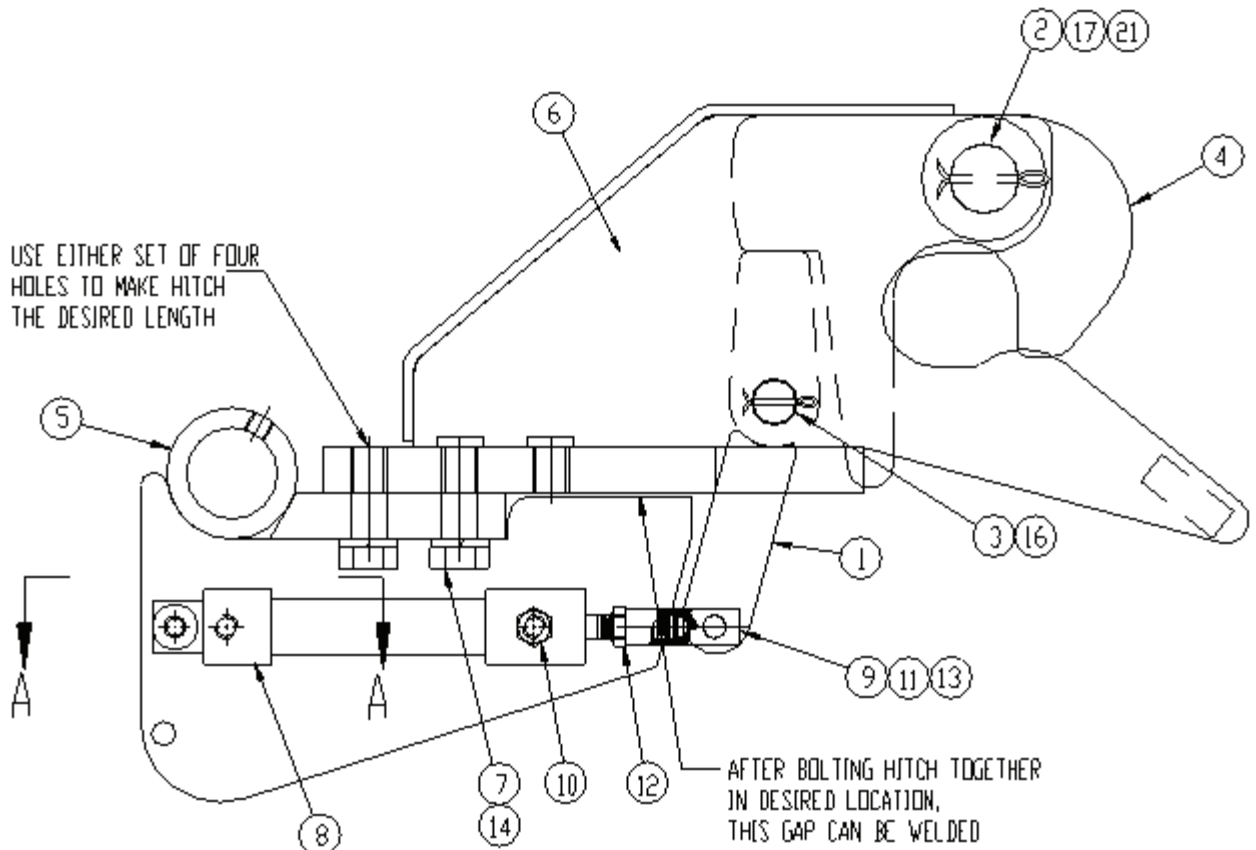
REV:



LB026

REF: 988896
 REV: 0

ITEM	PART NO.	QTY	DESCRIPTION
1	40541	1.00	LATCH, HOOK
2	40543	1.00	PIN, HOOK, 1.50 OD
3	40549	1.00	PIN, LATCH, 1.00 OD
4	40984	1.00	HOOK, HD TRUCK HITCH
5	41178	1.00	W/M, HITCH PIVOT, HD HITCH
6	41180	1.00	W/M, BASE, HD HITCH
7	71641	4.00	CSHH, .750-10X2.25, GR5
8	72526	1.00	CYL, HYD, 1.00B X 3.00S (SPRING)
9	72528	1.00	BALL JOINT, .500-20
10	72529	1.00	BREATHER, 04-MP
11	80058	1.00	NUT, HEX, .500-20
12	80093	1.00	NUT, HEX, JAM, .500-20
13	80164	1.00	WASHER, SPLIT LOCK, .500
14	80168	4.00	WASHER, SPLIT LOCK, .750
15	80232	1.00	CSHH, .375-16X2.50, GR5
16	80336	2.00	COTTER PIN, .188X1.50
17	80338	2.00	COTTER PIN, .188X2.00
18	80352	1.00	NUT, FLEXLOC, .375-16, FULL, LT
19	80706	4.00	WASHER, SAE PLAIN, 1.000
20	80996	1.00	WASHER, SAE PLAIN, .375
21	81089	4.00	WASHER, SAE PLAIN, 1.500



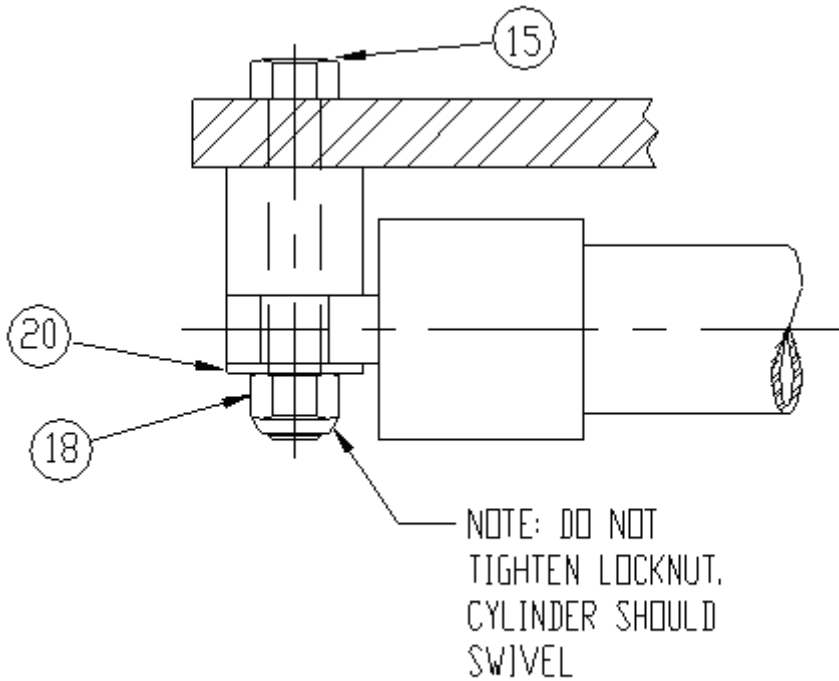
See DETAIL A on following page

REF: 40830 42387

REV: A

ITEM	PART NO.	QTY	DESCRIPTION
40830			FRONT HOPPER, 4WD GROUP
NS	40066	1.00	BRACKET,QUICK COUPLER
NS	72321	1.00	VLV,HYD,RELIEF,VENTABLE
NS	80036	12.00	NUT,HEX,.250-20
NS	80160	4.00	WASHER,SPLIT LOCK,.250
NS	80194	4.00	CSHH,.250-20X1.50,GR5
NS	99985	1.00	PIPE,BUSH,12MP-08FP,STL

42387			FRONT HOPPER, 2WD GROUP
NS	40066	1.00	BRACKET,QUICK COUPLER
NS	37624	1.00	VLV,HYD,SOLENOID W/RELIEF
NS	80036	12.00	NUT,HEX,.250-20
NS	80160	4.00	WASHER,SPLIT LOCK,.250
NS	80194	4.00	CSHH,.250-20X1.50,GR5
NS	99985	1.00	PIPE,BUSH,12MP-08FP,STL

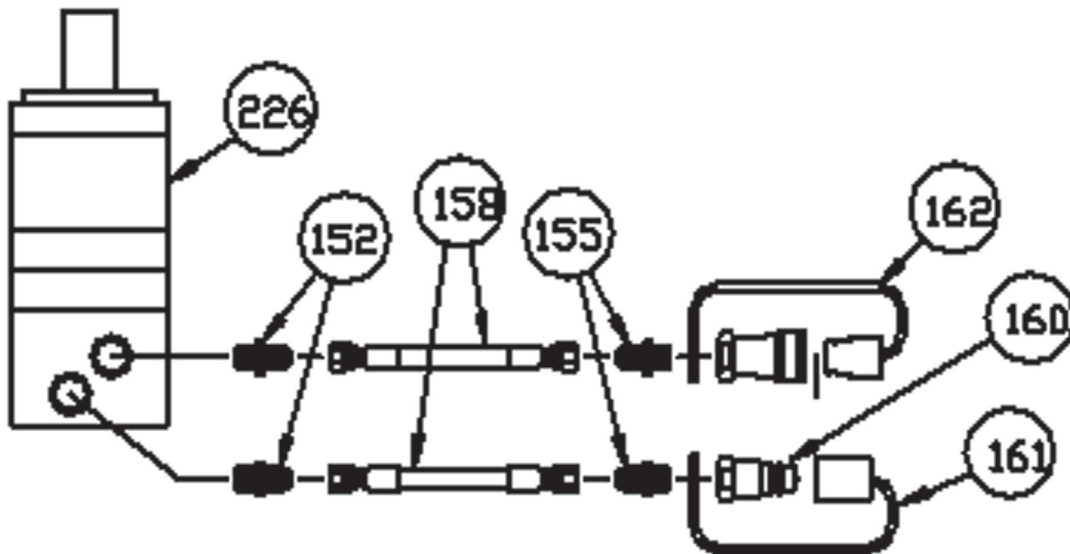


VIEW A-A

REF: 72724

REV:

ITEM	PART NO.	QTY	DESCRIPTION
152	71882	2.00	FITT,STR 12MJ-10MB
155	72178	2.00	FITT,STR 12MJ-12MP
158	72565-058	2.00	HOSE,12,12FJX-12FJX,2250
160	853182304	1.00	FITT,QD -12 FP,SET
161	853182305	1.00	CAP,DUST,12 QD
162	853182306	1.00	PLUG,DUST,12 QD
226	73220	1.00	MOTOR,HYD,15.5 CIR,LOW SPEED



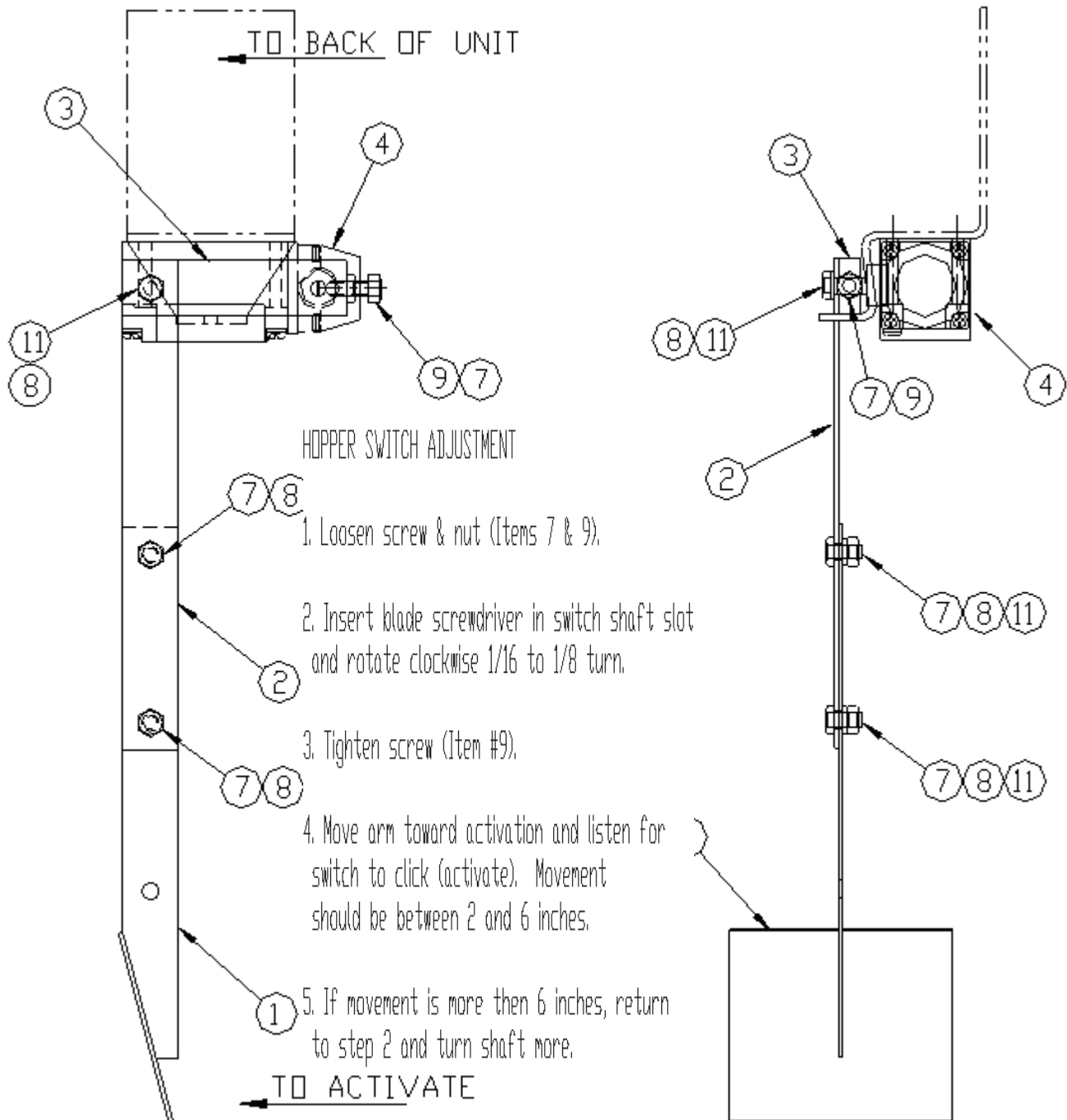
LB038

REF: 42176
 REV: 0

ITEM	PART NO.	QTY	DESCRIPTION
17	40927	2.00	PADDLE ASSY,AUTO CONVEYOR (Detail Following)
18	40928	4.00	CLAMP,DUAL HOSE,.75 OD
19	70452	2.00	KEY,SQ,.375X2
20	72372	9.00	FITT,PLUG 02PD,DUST
21	72689	1.00	FITT,TEST 06MB-02PD
22	73220	3.00	MOTOR,HYD,15.5CIR,LOW SPEED
23	80140	4.00	WASHER,TYPE A PLAIN,.250
24	80350	4.00	NUT,FLEXLOC,.250-20,FULL,LT
26	80787	4.00	CSHH,.250-20X2.50,GR5
27	80824	4.00	NUT,HEX,#10-24
28	80914	1.00	CSHH,M12X1.75X25,CL8.8
29	80997	4.00	MACH SCR,PH,#10-24X2.00
30	81108	2.00	CSHH,.312-18X3.75,GR5
31	851390302	2.00	FITT,CABLE 08MP,.250-.375
32	871066120	2.00	SEAL,SWITCH,NUT,.469-32
33	871071601	4.00	WASHER,SPLIT LOCK,#10
34	871111605	5.00	CLAMP,LOOP,.50 OD PLSTC COVER

REF: 40927
 REV: B

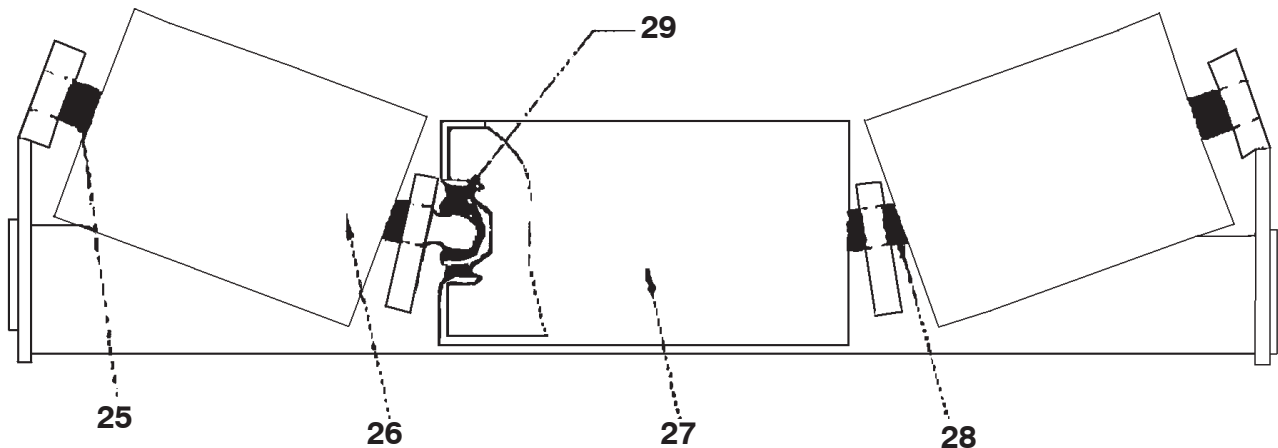
ITEM	PART NO.	QTY	DESCRIPTION
1	40920	1.00	LOWER PADDLE ARM W/M
2	40923	1.00	ARM, UPPER PADDLE
3	40924	1.00	ARM, PADDLE SWITCH
4	72411	1.00	LIMIT SWITCH ASSY
7	80036	3.00	NUT, HEX .25-20
8	80160	3.00	WASHER, SPLIT LOCK, .250
9	80185	1.00	CSHH, .250-20 X 1.00, GR5
11	80423	3.00	CSHH, .250-20 X .50, GR5



REF: 40354, 40355

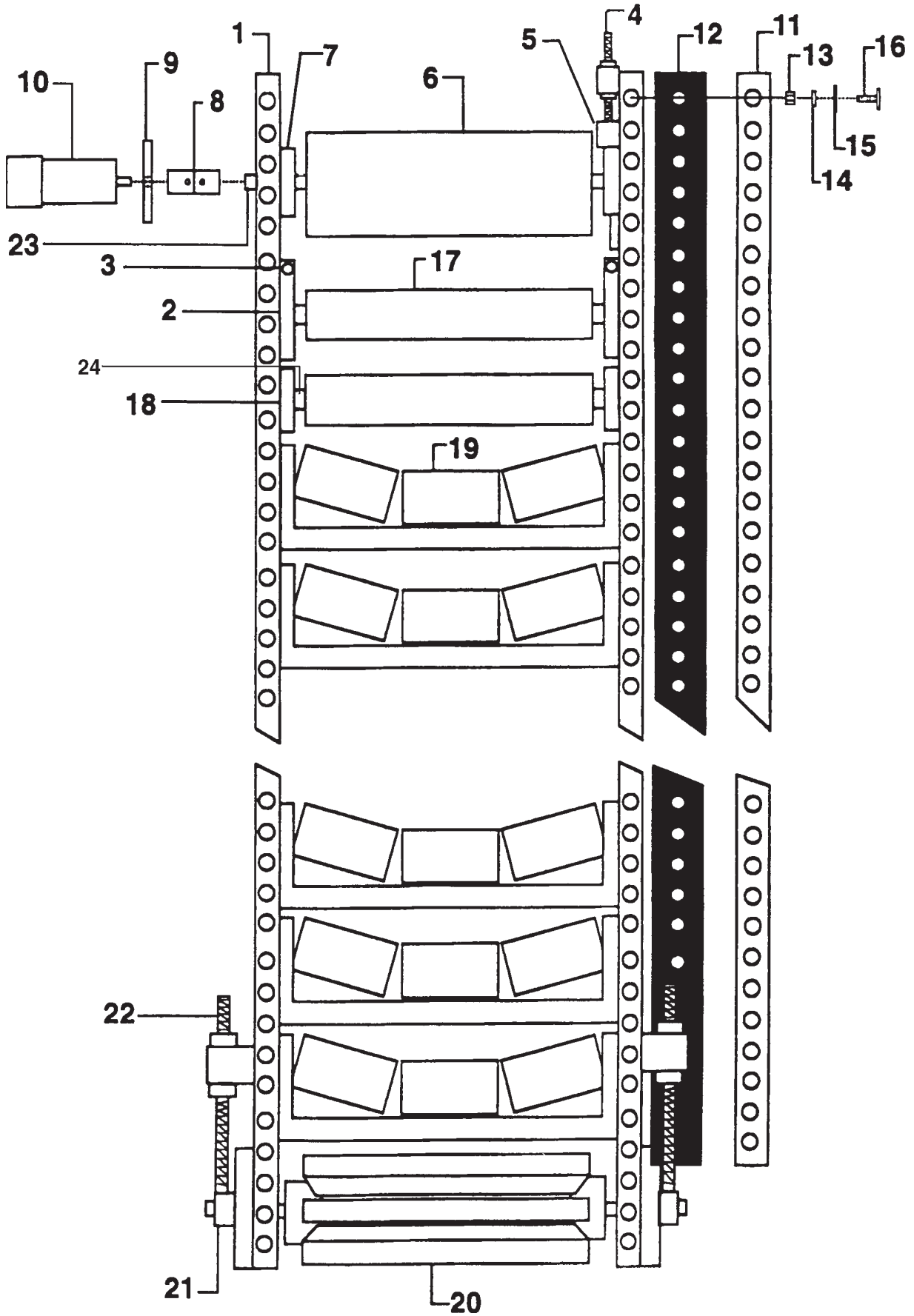
REV: 0

ITEM	PART NO.	QTY	DESCRIPTION
1	40343	1.00	RH CONVEYOR W/M
	40342	1.00	LH CONVEYOR W/M
2	106003046	2.00	BRACKET, BELT TIGHTENER
3	107000029	2.00	ROD, IDLER ROLLER ADJ, W/M
4	106007199	1.00	SCREW,ADJ .500-13X8.00
5	207001095	1.00	ADJUSTING PLATE W/M
6	307000815	1.00	PULLEY,HEAD
7	845311009	2.00	BEARING,FLANGE 1.50,4-BOLT
NS	40477	4.00	WASHER,2.50OD,.562IDX7GA.1793
8	207001186	1.00	COUPLING (MODIFIED)
9	306001174	1.00	TORQUE ARM
10	73220	REF	MOTOR,HYD,15.5 CIR,LOW SPEED
11	206000045	2.00	STRIP,CONVEYOR LAGGING
12	106000110	2.00	LAGGING,CONV BELT .25X4.00X216
13	80038	36.00	NUT,HEX,.375-16
14	80162	36.00	WASHER,SPLIT LOCK .375
15	80142	36.00	WASHER,TYPE A PLAIN,.375
16	871020102	36.00	CRG BOLT, .375-16X1.25,GR5
17	848031703	3.00	IDLER,RETURN,ROLLERS
18	40712	4.00	BRACKET, IDLER
19	848031702	7.00	IDLERS,TROUGHING
20	72534	1.00	PULLY,TAIL,WELDED
21	845282005	2.00	BEARING,TAKEUP,1.4375
22	106005801	2.00	SCREW,ADJ 7.50-10X18.00
23	106008031	1.00	SHAFT,HEAD PULLEY- <i>part of Head Pulley group</i>
24	848039014	6.00	END SHAFT
NS	871065533	2.00	LOCKNUT,3/4-10,THIN
NS	106006161	1.00	WIPER,CONV BELT SCRAPER- <i>Head Pulley End</i>
NS	106008061	1.00	LINING,CHUTE .25X7.00X26.00- <i>Tail Pulley End</i>
25	848039017	2.00	STUB SHAFT
26	848039010	2.00	ROLLER,END,4.50 DIAx6.375
27	848039011	1.00	ROLLER,CENTER,4.50 DIAx8.375
28	848039018	2.00	BEARING,SHAFT,2.625 LG
29	851500220	6.00	BEARING,CONVEYOR



REF: 40354, 40355

REV: 0



REF:

REV:

ITEM	PART NO.	QTY	DESCRIPTION
1	106000110	2.00	LAGGING,CONVEYOR BELT
2	40826	2.00	GATE,REAR W/M
3	72638	2.00	SKIRT,HOPPER SIDE, 12X18.50
4	72376	1.00	SKIRT,HOPPER BUMPER
5	106008061	2.00	CHUTE LINING
6	106000117	2.00	STRAP,BOLTING,,250X1.50X19.00
7	106000118	1.00	STRAP,BOLTING,,250X1.50X110
8	80255	17.00	CAPSCREW,.50-13 UNCX 2,GR5
9	80354	25.00	LOCKNUT,.50-13 UNC,LT
10	80144	25.00	WASHER,.50,TYPE A
11	84717053	2.00	COIL CHAIN #2
12	80845	2.00	COTTER PIN,.312X3.5
14	40825	2.00	GATE PIN HOLDER
15	206000045	2.00	STRIP,CONVEYOR LAGGING,RETAINER
16	209214001	2.00	CONVEYOR BELT ASSEMBLY

40706 CONVEYOR DRIVE GROUP (NON-ILLUSTRATED)

.....	000200190	2.00	SWITCH,TOGGLE,SPST,2-POS
.....	206002610	2.00	GUARD, COUPLING
.....	207001186	2.00	COUPLING
.....	21934	2.00	BAR,.250X1.00X3.00
.....	306001174	2.00	ARM,TORQUE
.....	33063	1.00	U-BOLT,.250-20,1.12IW,2.00IL
.....	34798	7.00	CLAMP,LOOP,1.25 OD,NPRN COVER
.....	34799	5.00	CLAMP,LOOP,1.562 OD,NPRN COVER
.....	34821	1.00	WELD PLATE,HOSE CLAMP
.....	34849	4.00	CLAMP,TUBE,1.00 OD TWIN
.....	34860	4.00	CLAMP,HALF,HOSE,.750
.....	34861	1.00	COVER,PLATE,HOSE CLAMP
.....	35368	1.00	SENDER,TEMP GAUGE,04 MP
.....	35371	1.00	SWITCH,TEMP,06 MP,230 DEG
.....	36305	2.00	PIPE,TEE,08MP-08FP-08FP,STL
.....	40757	1.00	VALVE,MOUNT W/M
.....	40927	2.00	PADDLE ASSEMBLY,AUTO-CONVEYOR
.....	40928	7.00	CLAMP,DUAL HOSE,.75 OD
.....	70452	2.00	KEY,SQ,375X2
.....	72372	3.00	FITT,PLUG 02PD,DUST
.....	72536	2.00	VLV,HYD,SOLENOID,2 WAY,NO
.....	72689	1.00	FITT,TEST 06MB-02PD
.....	72690	2.00	FITT,TEST 06MP-PD
.....	80140	4.00	WASHER,TYPE A PLAIN,.250
.....	80350	4.00	NUT,FLEXLOC,.250-20,FULL,LT
.....	80468	1.00	CSSH,312-18X3.25,GR5
.....	80787	4.00	CSSH,.250-20X2.50,GR5
.....	80824	4.00	NUT,HEX,#10-24
.....	80914	1.00	CSSH,M12X1.75X25,CL8.8
.....	80997	4.00	MACH SCR,PH,#10-24X2.00
.....	81108	2.00	CSSH,312-18X3,75,GR5
.....	851390302	2.00	FITT,CABLE 08MP,.250-.375
.....	871066120	2.00	SEAL,SWITCH,NUT,.469-32
.....	871071601	4.00	WASHER,SPLIT LOCK,#10
.....	871111605	5.00	CLAMP,LOOP,.50 OD PLSTC COVER
.....	953111045	2.00	MOTOR,HYD
.....	953183086	2.00	VLV,HYD,FLW CONT,2500RLF,12NPT
.....	99450	2.00	PIPE,BUSH,08MP-06FP,MI

REF: 40873

REV: A

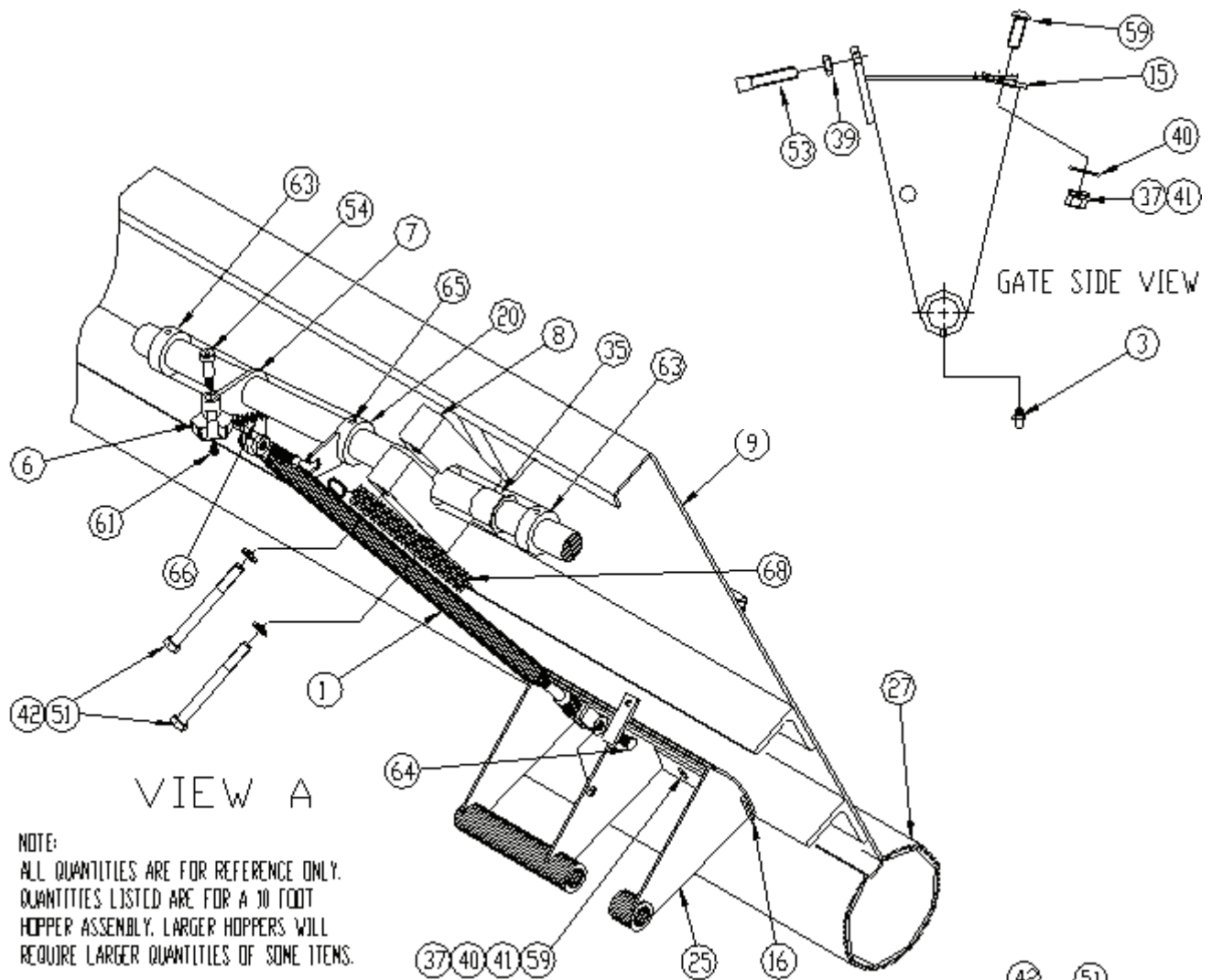
ITEM	PART NO.	QTY	DESCRIPTION
NS	007020096	2.00	HOOK,RUBBER
NS	206002562	2.00	DECAL,SHAMROCK
NS	35570	2.00	DECAL,SPRHH
NS	35943	1.00	DECAL,WARNING,GUARDS
Detail	40789-01	1.00	FRONT HOPPER ASSY,10 (Following Pages)
Detail	40789-02	1.00	FRONT HOPPER ASSY,11 (Following Pages)
Detail	40789-03	1.00	FRONT HOPPER ASSY,12 (Following Pages)
Detail	40789-04	1.00	FRONT HOPPER ASSY,13.5(Following Pages)
Detail	40789-05	1.00	FRONT HOPPER ASSY,14 (Following Pages)
Detail	40789-06	1.00	FRONT HOPPER ASSY,15 (Following Pages)
Detail	40789-07	1.00	FRONT HOPPER ASSY,16 (Following Pages)
Detail	40789-08	1.00	FRONT HOPPER ASSY,13 (Following Pages)
Detail	40789-09	1.00	FRONT HOPPER ASSY,14.5(Following Pages)
NS	72602	2.00	DECAL,DANGER,FRONT HOPPER
NS	72624	2.00	DECAL,CAUTION,FULL HOPPER
NS	72625	1.00	DECAL,GUARD MISSING,WARNING
NS	80196	2.00	CSHH,.250-20X2.00,GR5
NS	80350	2.00	NUT,FLEXLOC,.250-20,FULL,LT
NS	90709	1.00	PAINT,PRIMER
NS	91156	2.00	PAINT,CAT 1 YELLOW,ACRYLIC
NS	R135	14.00	GRIP,RUBBER,.625 ID
40789-01		FRONT HOPPER ASSY,10 FT	
NS	40345	1.00	ARM,FRONT GATE CONTROL
NS	40474	1.00	CHAIN GUARD W/M
NS	80038	63.00	NUT,HEX,.375-16
NS	80142	70.00	WASHER,TYPE A PLAIN,.375
NS	80162	63.00	WASHER,SPLIT LOCK,.375
NS	80224	23.00	CSHH,.375-16X1.25,GR5
NS	80786	14.00	SET S,SQ,.375-16X1.75
NS	R48-1	6.00	WASHER,FLAT,1.50X1.031X.062
NS	R48-2	6.00	WASHER,FLAT,1.50X1.031X.075
NS	R48-3	6.00	WASHER,FLAT,1.50X1.031X.125
1	107000672	14.00	ROD,W/M W/2 CLEVIS'S
2	208712192	2.00	BEARING ASSY,1.50 BORE,STEP
3	32956	18.00	FITT,LUBE,STR,.188 DRIVE
3	853750102	18.00	FITT,LUBE,STR,1/4-28
4	40074	1.00	SPROCKET,80FB12,.313 KEYWAY
5	40360	1.00	SPREADROLL REAR SEAL,10
6	40655	14.00	HANDLE,GATE LEVER
7	40668	14.00	GATE LATCH PLATE W/M
8	40738	3.00	BEARING BLOCK,FRONT HOPPER
9	40784-01	1.00	FRONT HOPPER W/M,10
10	40790	1.00	AUGER SHAFT,LH
11	40791	1.00	ADJUSTER PLATE
12	40792	2.00	WEAR PLATE
13	40793	1.00	BAR,.500X1.25X13.50,W/HOLES
14	40794-01	1.00	KEY,SQ,.375X3.25
15	40795	8.00	WEAR BAR,6 GATE
16	40796	4.00	WEAR BAR,12 GATE

FRONT HOPPER

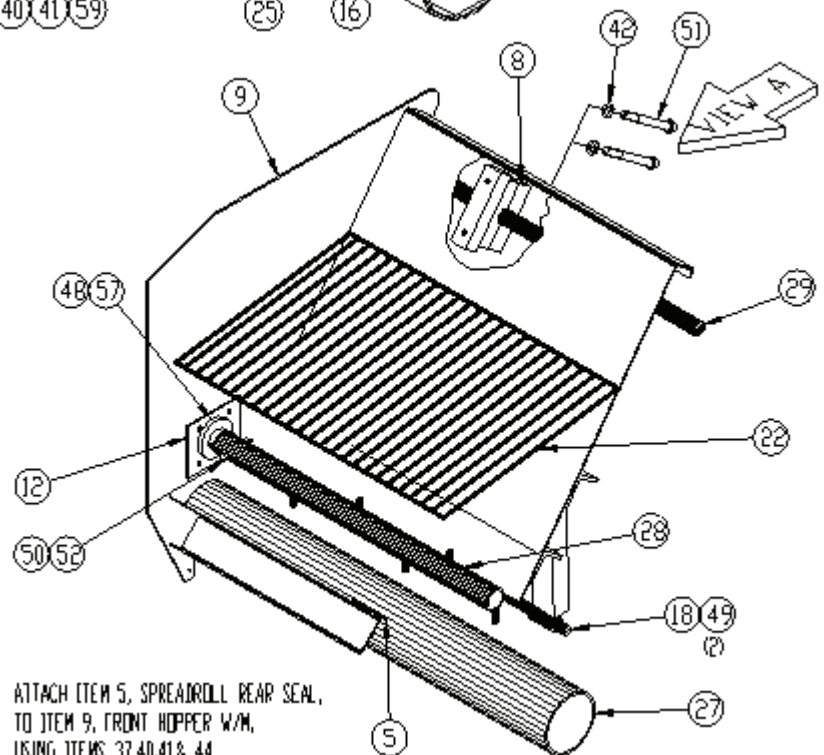
REF: 40789

REV: G

CSH-173/CSH-202 CHIPSPREADER



NOTE:
ALL QUANTITIES ARE FOR REFERENCE ONLY.
QUANTITIES LISTED ARE FOR A 10 FOOT
HOPPER ASSEMBLY. LARGER HOPPERS WILL
REQUIRE LARGER QUANTITIES OF SOME ITEMS.



REF: 40789

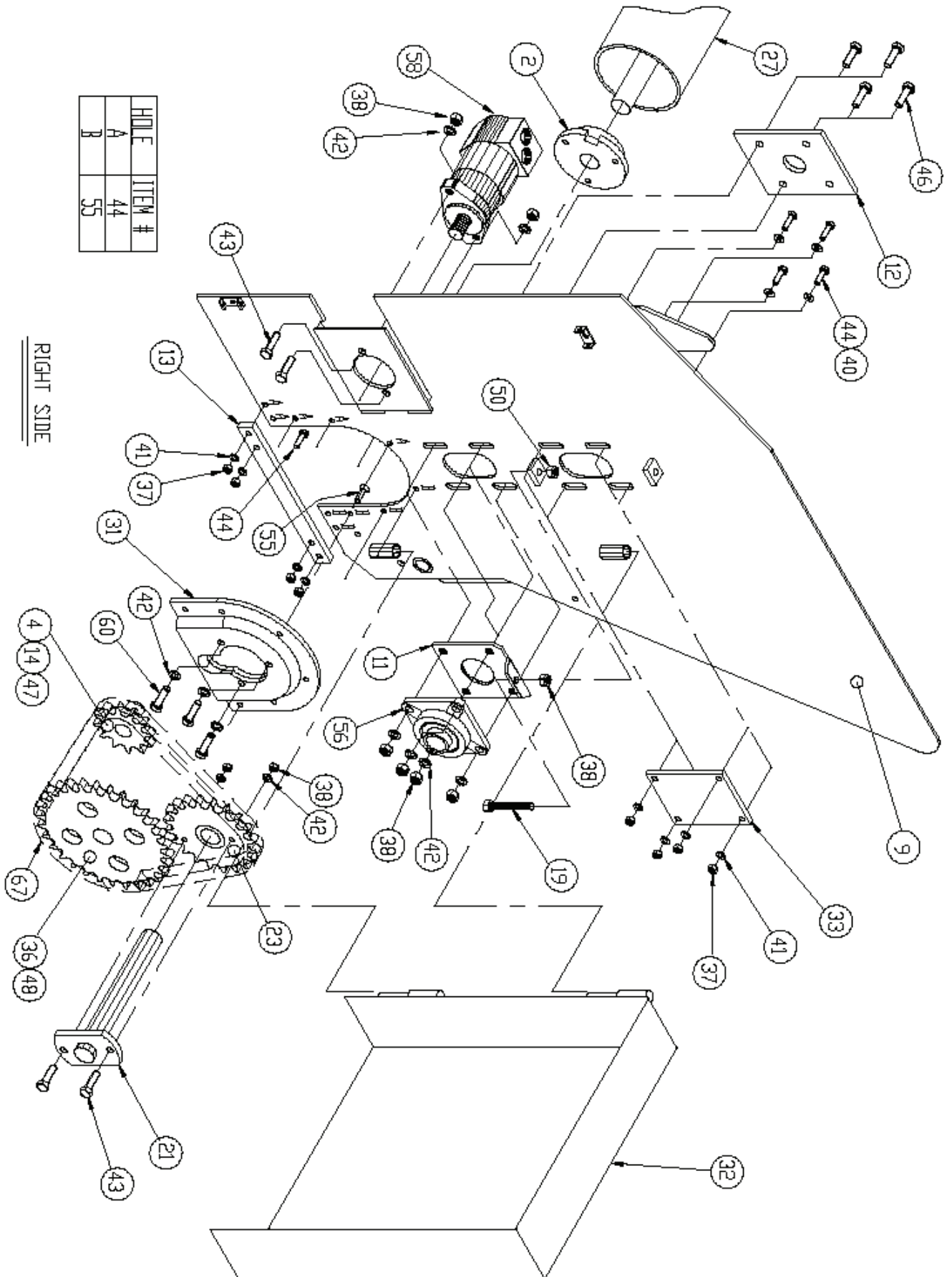
REV: G

ITEM	PART NO.	QTY	DESCRIPTION
17	40797	2.00	WEAR BAR,13.5 GATE
18	40798-07	1.00	GATE HINGE ROD,1 OD X 125.50
19	40799	1.00	ADJUSTMENT ROD W/M
20	40800	14.00	GATE LATCH FLANGE W/M
21	40846	1.00	AUGER SHAFT W/M,RH
22	40849-01	2.00	SEGREGATION SCREEN W/M,10
23	40850	1.00	BEARING & SPROCKET ASSY
24	40856	2.00	GATE,W/M,13.5
25	40857	4.00	GATE W/M,12,WITH PIVOT
26	40859	8.00	GATE W/M,6
27	40867-01	1.00	SPREADROLL W/M,10
28	40870-01	1.00	AUGER W/M,10
29	40872-01	1.00	ACTUATING SHAFT,10
30	41004	1.00	SHIELD,SPREAD ROLL,LH
31	41005	1.00	SHIELD,SPREAD ROLL,RH
32	41031	1.00	CHAIN GUARD W/M
33	41032	1.00	PLATE,HOLE COVER,RH
34	41033	1.00	PLATE,HOLE COVER,LH
35	72414	3.00	BEARING,PLASTIC,1.5 SHAFT
36	72530	1.00	SPROCKET,CHAIN,80BS30
37	80038	71.00	NUT,HEX,.375-16
38	80040	10.00	NUT,HEX,.500-13
39	80074	14.00	NUT,HEX,JAM,.375-16
40	80142	78.00	WASHER,TYPE A PLAIN,.375
41	80162	71.00	WASHER,SPLIT LOCK,.375
42	80164	12.00	WASHER,SPLIT LOCK,.500
43	80186	8.00	CSHH,.500-13X1.75,GR5
44	80224	31.00	CSHH,.375-16X1.25,GR5
46	80255	4.00	CSHH,.500-13X2.00,GR5
47	80301	1.00	SET S,HSKT,KCUP,.250-20X.500
48	80305	4.00	SET S,HSKT,.375-16X.50
49	80336	2.00	COTTER PIN,.188X1.50
50	80354	3.00	NUT,FLEXLOC,.500-13,FULL,LT
51	80403	6.00	CSHH,.500-13X5.00,GR5
52	80778	2.00	CSHH,.500-13X3.25,GR5
53	80831	14.00	SET S,SQ,.375-16X2.00
54	80973	14.00	SHLDR SCR,.500X1.00X.375-16
55	81022	8.00	CSSFH,.375-16X1.25
56	845311009	2.00	BEARING,FLANGE,1.50,4 BOLT
57	848019756	2.00	PLATE,WEAR
58	73220	1.00	MOTOR,HYD,15.5 CIR,LOW SPEED
59	871020103	40.00	CRG BOLT,.375-16X1.00,GR5
60	871032322	6.00	CSSFH,.500-13X1.25
61	871054100	14.00	DRIVE SCREW,#14x3/4
62	871072703	6.00	WASHER,LOCK,EXT TOOTH CSK,.500
63	871075203	17.00	COLLAR,SET,1.5IDX2.25ODX.75SST
64	871081000	28.00	PIN,CLEVIS,W/COTTER PIN
65	871081814	14.00	ROLL PIN,.313X2.25
66	871090146	14.00	SPRING
67	947071040	1.00	CHAIN,80X52 PITCHES W CONN&OFF
68	971090337	14.00	SPR,1.02 DIA X 11,3.92 PSI

FRONT HOPPER

CSH-173/CSH-202 CHIPSREADER

REF: 40789
 REV: G



HOLE	ITEM #
A	44
B	55

REF: 40789

REV: G

ITEM	PART NO.	QTY	DESCRIPTION
	40789-02		FRONT HOPPER ASSY,11 FT
1.....	107000672.....	14.00.....	ROD,W/M W/2 CLEVIS'S
2.....	208712192.....	2.00.....	BEARING ASSY
3.....	32956.....	18.00.....	FITT,LUBE,STR,.188 DRIVE
4.....	40074.....	1.00.....	SPROCKET,REWORK,.313 KEYWAY
5.....	40361.....	1.00.....	SPREADROLL REAR SEAL,11
6.....	40655.....	14.00.....	HANDLE,GATE LEVER
7.....	40668.....	14.00.....	GATE LATCH PLATE W/M
8.....	40738.....	3.00.....	BEARING BLOCK,FRONT HOPPER
9.....	40784-02.....	1.00.....	FRONT HOPPER W/M,11
10.....	40790.....	1.00.....	AUGER SHAFT,LH
11.....	40791.....	1.00.....	ADJUSTER PLATE
12.....	40792.....	2.00.....	WEAR PLATE
13.....	40793.....	1.00.....	BAR,.500X1.25X13.50,W/HOLES
14.....	40794-01.....	1.00.....	KEY,SQ,.375X3.25
15.....	40795.....	6.00.....	WEAR BAR,6 GATE
16.....	40796.....	8.00.....	WEAR BAR,12 GATE
18.....	40798-08.....	1.00.....	GATE HINGE ROD,1 OD X 134.50
19.....	40799.....	1.00.....	ADJUSTMENT ROD W/M
20.....	40800.....	14.00.....	GATE LATCH FLANGE W/M
21.....	40846.....	1.00.....	AUGER SHAFT W/M,RH
22.....	40849-02.....	2.00.....	SEGREGATION SCREEN W/M,11
23.....	40850.....	1.00.....	BEARING & SPROCKET ASSY
24.....	40858.....	4.00.....	GATE W/M,12
25.....	40857.....	4.00.....	GATE W/M,12,WITH PIVOT
26.....	40859.....	6.00.....	GATE W/M,6
27.....	40867-02.....	1.00.....	SPREADROLL W/M,11
28.....	40870-02.....	1.00.....	AUGER W/M,11
29.....	40872-02.....	1.00.....	ACTUATING SHAFT,11
30.....	41004.....	1.00.....	SHIELD,SPREAD ROLL,LH
31.....	41005.....	1.00.....	SHIELD,SPREAD ROLL,RH
32.....	41031.....	1.00.....	CHAIN GUARD W/M
33.....	41032.....	1.00.....	PLATE,HOLE COVER,RH
34.....	41033.....	1.00.....	PLATE,HOLE COVER,LH
35.....	72414.....	3.00.....	BEARING,PLASTIC,1.5 SHAFT
36.....	72530.....	1.00.....	SPROCKET,CHAIN,80BS30
37.....	80038.....	76.00.....	NUT,HEX,.375-16
38.....	80040.....	10.00.....	NUT,HEX,.500-13
39.....	80074.....	14.00.....	NUT,HEX,JAM,.375-16
40.....	80142.....	84.00.....	WASHER,TYPE A PLAIN,.375
41.....	80162.....	76.00.....	WASHER,SPLIT LOCK,.375
42.....	80164.....	12.00.....	WASHER,SPLIT LOCK,.500
43.....	80186.....	8.00.....	CSHH,.500-13X1.75,GR5
44.....	80224.....	32.00.....	CSHH,.375-16X1.25,GR5
46.....	80255.....	4.00.....	CSHH,.500-13X2.00,GR5
47.....	80301.....	1.00.....	SET S,HSKT,KCUP,.250-20X.500
48.....	80305.....	4.00.....	SET S,HSKT,.375-16X.50
49.....	80336.....	2.00.....	COTTER PIN,.188X1.50
50.....	80354.....	3.00.....	NUT,FLEXLOC,.500-13,FULL,LT
51.....	80403.....	6.00.....	CSHH,.500-13X5.00,GR5
52.....	80778.....	2.00.....	CSHH,.500-13X3.25,GR5

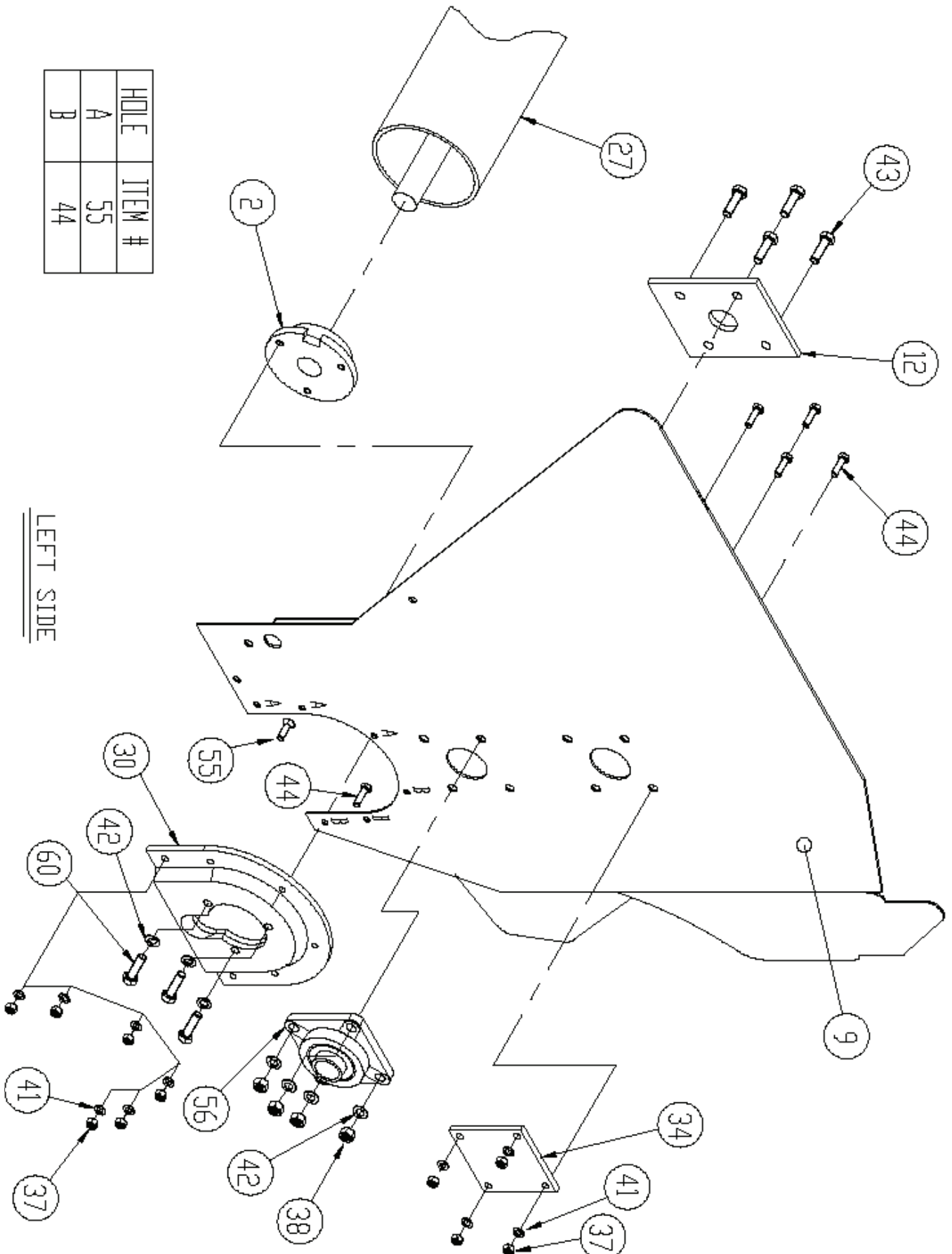
FRONT HOPPER

CSH-173/CSH-202 CHIPSPREADER

REF: 40789

REV: G

HOLE	ITEM #
A	55
B	44



LEFT SIDE

REF: 40789

REV: G

ITEM	PART NO.	QTY	DESCRIPTION
53.....	80831.....	14.00.....	SET S,SQ,.375-16X2.00
54.....	80973.....	14.00.....	SHLDR SCR,.500X1.00X.375-16
55.....	81022.....	8.00.....	CSSFH,.375-16X1.25
56.....	845311009.....	2.00.....	BEARING,FLANGE 1.50,4-BOLT
57.....	848019756.....	2.00.....	PLATE,WEAR
58.....	853111043.....	1.00.....	MOTOR,HYDRAULIC
59.....	871020103.....	44.00.....	CRG BOLT,.375-16X1.00,GR5
60.....	871032322.....	6.00.....	CSSFH,.500-13X1.25
61.....	871054100.....	14.00.....	DRIVE SCREW,#14x3/4
62.....	871072703.....	6.00.....	WASHER,LOCK,EXT TOOTH CSK,.500
63.....	871075203.....	17.00.....	COLLAR,SET,1.5IDX2.25ODX.75SST
64.....	871081000.....	28.00.....	PIN,CLEVIS,W/COTTER PIN
65.....	871081814.....	14.00.....	PIN,ROLL,.313X2.25
66.....	871090146.....	14.00.....	SPRING
67.....	947071040.....	1.00.....	CHAIN,80X53 PITCHES W CONN
68.....	971090337.....	14.00.....	SPR,1.02 DIA X 11,3.92 PSI
40789-03			FRONT HOPPER ASSY,12 FT
1.....	107000672.....	16.00.....	ROD,W/M W/2 CLEVIS'S
2.....	208712192.....	2.00.....	BEARING ASSY
3.....	32956.....	20.00.....	FITT,LUBE,STR,.188 DRIVE
4.....	40074.....	1.00.....	SPROCKET,REWORK,.313 KEYWAY
5.....	40362.....	1.00.....	SPREADROLL REAR SEAL,12
6.....	40655.....	16.00.....	HANDLE,GATE LEVER
7.....	40668.....	16.00.....	GATE LATCH PLATE W/M
8.....	40738.....	5.00.....	BEARING BLOCK,FRONT HOPPER
9.....	40784-03.....	1.00.....	FRONT HOPPER W/M,12
10.....	40790.....	1.00.....	AUGER SHAFT,LH
11.....	40791.....	1.00.....	ADJUSTER PLATE
12.....	40792.....	2.00.....	WEAR PLATE
13.....	40793.....	1.00.....	BAR,.500X1.25X13.50,W/HOLES
14.....	40794-01.....	1.00.....	KEY,SQ,.375X3.25
15.....	40795.....	8.00.....	WEAR BAR,6 GATE
16.....	40796.....	8.00.....	WEAR BAR,12 GATE
18.....	40798-01.....	1.00.....	GATE HINGE ROD,1 OD X 70.00
18.....	40798-02.....	1.00.....	GATE HINGE ROD,1 OD X 76.00
19.....	40799.....	1.00.....	ADJUSTMENT ROD W/M
20.....	40800.....	16.00.....	GATE LATCH FLANGE W/M
21.....	40846.....	1.00.....	AUGER SHAFT W/M,RH
22.....	40849-03.....	2.00.....	SEGREGATION SCREEN W/M,12
23.....	40850.....	1.00.....	BEARING & SPROCKET ASSY
24.....	40858.....	4.00.....	GATE W/M,12
25.....	40857.....	4.00.....	GATE W/M,12,WITH PIVOT
26.....	40859.....	8.00.....	GATE W/M,6
27.....	40867-03.....	1.00.....	SPREADROLL W/M,12
28.....	40870-03.....	1.00.....	AUGER W/M,12
29.....	40872-03.....	1.00.....	ACTUATING SHAFT,12
30.....	41004.....	1.00.....	SHIELD,SPREAD ROLL,LH
31.....	41005.....	1.00.....	SHIELD,SPREAD ROLL,RH
32.....	41031.....	1.00.....	CHAIN GUARD W/M
33.....	41032.....	1.00.....	PLATE,HOLE COVER,RH

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ITEM	PART NO.	QTY	DESCRIPTION
34.....	41033.....	1.00.....	PLATE,HOLE COVER,LH
35.....	72414.....	5.00.....	BEARING,PLASTIC,1.5 SHAFT
36.....	72530.....	1.00.....	SPROCKET,CHAIN,80BS30
37.....	80038.....	81.00.....	NUT,HEX,.375-16
38.....	80040.....	10.00.....	NUT,HEX,.500-13
39.....	80074.....	16.00.....	NUT,HEX,JAM,.375-16
40.....	80142.....	90.00.....	WASHER,TYPE A PLAIN,.375
41.....	80162.....	81.00.....	WASHER,SPLIT LOCK,.375
42.....	80164.....	14.00.....	WASHER,SPLIT LOCK,.500
43.....	80186.....	8.00.....	CSHH,.500-13X1.75,GR5
44.....	80224.....	33.00.....	CSHH,.375-16X1.25,GR5
46.....	80255.....	4.00.....	CSHH,.500-13X2.00,GR5
47.....	80301.....	1.00.....	SET S,HSKT,KCUP,.250-20X.500
48.....	80305.....	4.00.....	SET S,HSKT,.375-16X.50
49.....	80336.....	2.00.....	COTTER PIN,.188X1.50
50.....	80354.....	3.00.....	NUT,FLEXLOC,.500-13,FULL,LT
51.....	80403.....	10.00.....	CSHH,.500-13X5.00,GR5
52.....	80778.....	2.00.....	CSHH,.500-13X3.25,GR5
53.....	80831.....	16.00.....	SET S,SQ,.375-16X2.00
54.....	80973.....	16.00.....	SHLDR SCR,.500X1.00X.375-16
55.....	81022.....	8.00.....	CSSFH,.375-16X1.25
56.....	845311009.....	2.00.....	BEARING,FLANGE 1.50,4-BOLT
57.....	848019756.....	2.00.....	PLATE,WEAR
58.....	853111043.....	1.00.....	MOTOR,HYDRAULIC
59.....	871020103.....	48.00.....	CRG BOLT,.375-16X1.00,GR5
60.....	871032322.....	6.00.....	CSSFH,.500-13X1.25
61.....	871054100.....	16.00.....	DRIVE SCREW,#14x3/4
62.....	871072703.....	6.00.....	WASHER,LOCK,EXT TOOTH CSK,.500
63.....	871075203.....	21.00.....	COLLAR,SET,1.5IDX2.25ODX.75SST
64.....	871081000.....	32.00.....	PIN,CLEVIS,W/COTTER PIN
65.....	871081814.....	16.00.....	PIN,ROLL,.313X2.25
66.....	871090146.....	16.00.....	SPRING
67.....	947071040.....	1.00.....	CHAIN,80X53 PITCHES W CONN
68.....	971090337.....	16.00.....	SPR,1.02 DIA X 11,3.92 PSI
40789-04			FRONT HOPPER ASSY,13.5 FT
1.....	107000672.....	19.00.....	ROD,W/M W/2 CLEVIS'S
2.....	208712192.....	2.00.....	BEARING ASSY
3.....	32956.....	23.00.....	FITT,LUBE,STR,.188 DRIVE
4.....	40074.....	1.00.....	SPROCKET,REWORK,.313 KEYWAY
5.....	40363.....	1.00.....	SPREADROLL REAR SEAL,13.5
6.....	40655.....	19.00.....	HANDLE,GATE LEVER
7.....	40668.....	19.00.....	GATE LATCH PLATE W/M
8.....	40738.....	5.00.....	BEARING BLOCK,FRONT HOPPER
9.....	40784-04.....	1.00.....	FRONT HOPPER W/M,13.5
10.....	40790.....	1.00.....	AUGER SHAFT,LH
11.....	40791.....	1.00.....	ADJUSTER PLATE
12.....	40792.....	2.00.....	WEAR PLATE
13.....	40793.....	1.00.....	BAR,.500X1.25X13.50,W/HOLES
14.....	40794-01.....	1.00.....	KEY,SQ,.375X3.25
15.....	40795.....	11.00.....	WEAR BAR,6 GATE

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ITEM	PART NO.	QTY	DESCRIPTION
16.....	40796.....	8.00.....	WEAR BAR,12 GATE
18.....	40798-02.....	1.00.....	GATE HINGE ROD,1 OD X 76.00
18.....	40798-04.....	1.00.....	GATE HINGE ROD,1 OD X 88.00
19.....	40799.....	1.00.....	ADJUSTMENT ROD W/M
20.....	40800.....	19.00.....	GATE LATCH FLANGE W/M
21.....	40846.....	1.00.....	AUGER SHAFT W/M,RH
22.....	40849-04.....	2.00.....	SEGREGATION SCREEN W/M,13.5
23.....	40850.....	1.00.....	BEARING & SPROCKET ASSY
24.....	40858.....	4.00.....	GATE W/M,12
25.....	40857.....	4.00.....	GATE W/M,12,WITH PIVOT
26.....	40859.....	11.00.....	GATE W/M,6
27.....	40867-04.....	1.00.....	SPREADROLL W/M,13.5
28.....	40870-04.....	1.00.....	AUGER W/M,13.5
29.....	40872-04.....	1.00.....	ACTUATING SHAFT,13.5
30.....	41004.....	1.00.....	SHIELD,SPREAD ROLL,LH
31.....	41005.....	1.00.....	SHIELD,SPREAD ROLL,RH
32.....	41031.....	1.00.....	CHAIN GUARD W/M
33.....	41032.....	1.00.....	PLATE,HOLE COVER,RH
34.....	41033.....	1.00.....	PLATE,HOLE COVER,LH
35.....	72414.....	5.00.....	BEARING,PLASTIC,1.5 SHAFT
36.....	72530.....	1.00.....	SPROCKET,CHAIN,80BS30
37.....	80038.....	88.00.....	NUT,HEX,375-16
38.....	80040.....	10.00.....	NUT,HEX,500-13
39.....	80074.....	19.00.....	NUT,HEX,JAM,375-16
40.....	80142.....	98.00.....	WASHER,TYPE A PLAIN,375
41.....	80162.....	88.00.....	WASHER,SPLIT LOCK,375
42.....	80164.....	14.00.....	WASHER,SPLIT LOCK,500
43.....	80186.....	8.00.....	CSHH,500-13X1.75,GR5
44.....	80224.....	34.00.....	CSHH,375-16X1.25,GR5
46.....	80255.....	4.00.....	CSHH,500-13X2.00,GR5
47.....	80301.....	1.00.....	SET S,HSKT,KCUP,250-20X.500
48.....	80305.....	4.00.....	SET S,HSKT,375-16X.50
49.....	80336.....	2.00.....	COTTER PIN,188X1.50
50.....	80354.....	3.00.....	NUT,FLEXLOC,500-13,FULL,LT
51.....	80403.....	10.00.....	CSHH,500-13X5.00,GR5
52.....	80778.....	2.00.....	CSHH,500-13X3.25,GR5
53.....	80831.....	19.00.....	SET S,SQ,375-16X2.00
54.....	80973.....	19.00.....	SHLDR SCR,500X1.00X.375-16
55.....	81022.....	8.00.....	CSSFH,375-16X1.25
56.....	845311009.....	2.00.....	BEARING,FLANGE 1.50,4-BOLT
57.....	848019756.....	2.00.....	PLATE,WEAR
58.....	853111043.....	1.00.....	MOTOR,HYDRAULIC
59.....	871020103.....	54.00.....	CRG BOLT,375-16X1.00,GR5
60.....	871032322.....	6.00.....	CSSFH,500-13X1.25
61.....	871054100.....	19.00.....	DRIVE SCREW,#14x3/4
62.....	871072703.....	6.00.....	WASHER,LOCK,EXT TOOTH CSK,500
63.....	871075203.....	24.00.....	COLLAR,SET,1.5IDX2.25ODX.75SST
64.....	871081000.....	38.00.....	PIN,CLEVIS,W/COTTER PIN
66.....	871081814.....	19.00.....	PIN,ROLL,313X2.25
66.....	871090146.....	19.00.....	SPRING
67.....	947071040.....	1.00.....	CHAIN,80X53 PITCHES W CONN

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ITEM	PART NO.	QTY	DESCRIPTION
68.....	971090337.....	19.00.....	SPR,1.02 DIA X 11,3.92 PSI
40789-05			FRONT HOPPER ASSY,14 FT
1.....	107000672.....	20.00.....	ROD,W/M W/2 CLEVIS'S
2.....	208712192.....	2.00.....	BEARING ASSY
3.....	32956.....	24.00.....	FITT,LUBE,STR,,188 DRIVE
4.....	40074.....	1.00.....	SPROCKET,REWORK,.313 KEYWAY
5.....	40364.....	1.00.....	SPREADROLL REAR SEAL,14
6.....	40655.....	20.00.....	HANDLE,GATE LEVER
7.....	40668.....	20.00.....	GATE LATCH PLATE W/M
8.....	40738.....	5.00.....	BEARING BLOCK,FRONT HOPPER
9.....	40784-05.....	1.00.....	FRONT HOPPER W/M,14
10.....	40790.....	1.00.....	AUGER SHAFT,LH
11.....	40791.....	1.00.....	ADJUSTER PLATE
12.....	40792.....	2.00.....	WEAR PLATE
13.....	40793.....	1.00.....	BAR,.500X1.25X13.50,W/HOLES
14.....	40794-01.....	1.00.....	KEY,SQ,.375X3.25
15.....	40795.....	12.00.....	WEAR BAR,6 GATE
16.....	40796.....	8.00.....	WEAR BAR,12 GATE
18.....	40798-03.....	1.00.....	GATE HINGE ROD,1 OD X 82.00
18.....	40798-04.....	1.00.....	GATE HINGE ROD,1 OD X 88.00
19.....	40799.....	1.00.....	ADJUSTMENT ROD W/M
20.....	40800.....	20.00.....	GATE LATCH FLANGE W/M
21.....	40846.....	1.00.....	AUGER SHAFT W/M,RH
22.....	40849-05.....	2.00.....	SEGREGATION SCREEN W/M,14
23.....	40850.....	1.00.....	BEARING & SPROCKET ASSY
24.....	40858.....	4.00.....	GATE W/M,12
25.....	40857.....	4.00.....	GATE W/M,12,WITH PIVOT
26.....	40859.....	12.00.....	GATE W/M,6
27.....	40867-05.....	1.00.....	SPREADROLL W/M,14
28.....	40870-05.....	1.00.....	AUGER W/M,14
29.....	40872-05.....	1.00.....	ACTUATING SHAFT,14
30.....	41004.....	1.00.....	SHIELD,SPREAD ROLL,LH
31.....	41005.....	1.00.....	SHIELD,SPREAD ROLL,RH
32.....	41031.....	1.00.....	CHAIN GUARD W/M
33.....	41032.....	1.00.....	PLATE,HOLE COVER,RH
34.....	41033.....	1.00.....	PLATE,HOLE COVER,LH
35.....	72414.....	5.00.....	BEARING,PLASTIC,1.5 SHAFT
36.....	72530.....	1.00.....	SPROCKET,CHAIN,80BS30
37.....	80038.....	91.00.....	NUT,HEX,.375-16
38.....	80040.....	10.00.....	NUT,HEX,.500-13
39.....	80074.....	20.00.....	NUT,HEX,JAM,.375-16
40.....	80142.....	102.00.....	WASHER,TYPE A PLAIN,.375
41.....	80162.....	91.00.....	WASHER,SPLIT LOCK,.375
42.....	80164.....	14.00.....	WASHER,SPLIT LOCK,.500
43.....	80186.....	8.00.....	CSHH,.500-13X1.75,GR5
44.....	80224.....	35.00.....	CSHH,.375-16X1.25,GR5
46.....	80255.....	4.00.....	CSHH,.500-13X2.00,GR5
47.....	80301.....	1.00.....	SET S,HSKT,KCUP,.250-20X.500
48.....	80305.....	4.00.....	SET S,HSKT,.375-16X.50

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ITEM	PART NO.	QTY	DESCRIPTION
49.....	80336.....	2.00.....	COTTER PIN,.188X1.50
50.....	80354.....	3.00.....	NUT,FLEXLOC,.500-13,FULL,LT
51.....	80403.....	10.00.....	CSHH,.500-13X5.00,GR5
52.....	80778.....	2.00.....	CSHH,.500-13X3.25,GR5
53.....	80831.....	20.00.....	SET S,SQ,.375-16X2.00
54.....	80973.....	20.00.....	SHLDR SCR,.500X1.00X.375-16
55.....	81022.....	8.00.....	CSSFH,.375-16X1.25
56.....	845311009.....	2.00.....	BEARING,FLANGE 1.50,4-BOLT
57.....	848019756.....	2.00.....	PLATE,WEAR
58.....	853111043.....	1.00.....	MOTOR,HYDRAULIC
59.....	871020103.....	56.00.....	CRG BOLT,.375-16X1.00,GR5
60.....	871032322.....	6.00.....	CSSFH,.500-13X1.25
61.....	871054100.....	20.00.....	DRIVE SCREW,#14x3/4
62.....	871072703.....	6.00.....	WASHER,LOCK,EXT TOOTH CSK,.500
63.....	871075203.....	25.00.....	COLLAR,SET,1.5IDX2.25ODX.75SST
64.....	871081000.....	40.00.....	PIN,CLEVIS,W/COTTER PIN
65.....	871081814.....	20.00.....	PIN,ROLL,.313X2.25
66.....	871090146.....	20.00.....	SPRING
67.....	947071040.....	1.00.....	CHAIN,80X53 PITCHES W CONN
68.....	971090337.....	20.00.....	SPR,1.02 DIA X 11,3.92 PSI
40789-06			FRONT HOPPER ASSY,15 FT
1.....	107000672.....	21.00.....	ROD,W/M W/2 CLEVIS'S
2.....	208712192.....	2.00.....	BEARING ASSY
3.....	32956.....	26.00.....	FITT,LUBE,STR,.188 DRIVE
4.....	40074.....	1.00.....	SPROCKET,REWORK,.313 KEYWAY
5.....	40365.....	1.00.....	SPREADROLL REAR SEAL,15
6.....	40655.....	21.00.....	HANDLE,GATE LEVER
7.....	40668.....	21.00.....	GATE LATCH PLATE W/M
8.....	40738.....	5.00.....	BEARING BLOCK,FRONT HOPPER
9.....	40784-06.....	1.00.....	FRONT HOPPER W/M,15
10.....	40790.....	1.00.....	AUGER SHAFT,LH
11.....	40791.....	1.00.....	ADJUSTER PLATE
12.....	40792.....	2.00.....	WEAR PLATE
13.....	40793.....	1.00.....	BAR,.500X1.25X13.50,W/HOLES
14.....	40794-01.....	1.00.....	KEY,SQ,.375X3.25
15.....	40795.....	12.00.....	WEAR BAR,6 GATE
16.....	40796.....	9.00.....	WEAR BAR,12 GATE
18.....	40798-05.....	1.00.....	GATE HINGE ROD,1 OD X 94.00
18.....	40798-04.....	1.00.....	GATE HINGE ROD,1 OD X 88.00
19.....	40799.....	1.00.....	ADJUSTMENT ROD W/M
20.....	40800.....	21.00.....	GATE LATCH FLANGE W/M
21.....	40846.....	1.00.....	AUGER SHAFT W/M,RH
22.....	40849-06.....	2.00.....	SEGREGATION SCREEN W/M,15
23.....	40850.....	1.00.....	BEARING & SPROCKET ASSY
24.....	40858.....	4.00.....	GATE W/M,12
25.....	40857.....	5.00.....	GATE W/M,12,WITH PIVOT
26.....	40859.....	12.00.....	GATE W/M,6
27.....	40867-06.....	1.00.....	SPREADROLL W/M,15
28.....	40870-06.....	1.00.....	AUGER W/M,15
29.....	40872-06.....	1.00.....	ACTUATING SHAFT,15

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ITEM	PART NO.	QTY	DESCRIPTION
30.....	41004.....	1.00.....	SHIELD,SPREAD ROLL,LH
31.....	41005.....	1.00.....	SHIELD,SPREAD ROLL,RH
32.....	41031.....	1.00.....	CHAIN GUARD W/M
33.....	41032.....	1.00.....	PLATE,HOLE COVER,RH
34.....	41033.....	1.00.....	PLATE,HOLE COVER,LH
35.....	72414.....	5.00.....	BEARING,PLASTIC,1.5 SHAFT
36.....	72530.....	1.00.....	SPROCKET,CHAIN,80BS30
37.....	80038.....	96.00.....	NUT,HEX,.375-16
38.....	80040.....	10.00.....	NUT,HEX,.500-13
39.....	80074.....	21.00.....	NUT,HEX,JAM,.375-16
40.....	80142.....	108.00.....	WASHER,TYPE A PLAIN,.375
41.....	80162.....	96.00.....	WASHER,SPLIT LOCK,.375
42.....	80164.....	14.00.....	WASHER,SPLIT LOCK,.500
43.....	80186.....	8.00.....	CSHH,.500-13X1.75,GR5
44.....	80224.....	36.00.....	CSHH,.375-16X1.25,GR5
46.....	80255.....	4.00.....	CSHH,.500-13X2.00,GR5
47.....	80301.....	1.00.....	SET S,HSKT,KCUP,.250-20X.500
48.....	80305.....	4.00.....	SET S,HSKT,.375-16X.50
49.....	80336.....	2.00.....	COTTER PIN,.188X1.50
50.....	80354.....	3.00.....	NUT,FLEXLOC,.500-13,FULL,LT
51.....	80403.....	10.00.....	CSHH,.500-13X5.00,GR5
52.....	80778.....	2.00.....	CSHH,.500-13X3.25,GR5
53.....	80831.....	21.00.....	SET S,SQ,.375-16X2.00
54.....	80973.....	21.00.....	SHLDR SCR,.500X1.00X.375-16
55.....	81022.....	8.00.....	CSSFH,.375-16X1.25
56.....	845311009.....	2.00.....	BEARING,FLANGE 1.50,4-BOLT
57.....	848019756.....	2.00.....	PLATE,WEAR
58.....	853111043.....	1.00.....	MOTOR,HYDRAULIC
59.....	871020103.....	60.00.....	CRG BOLT,.375-16X1.00,GR5
60.....	871032322.....	6.00.....	CSSFH,.500-13X1.25
61.....	871054100.....	21.00.....	DRIVE SCREW,#14x3/4
62.....	871072703.....	6.00.....	WASHER,LOCK,EXT TOOTH CSK,.500
63.....	871075203.....	26.00.....	COLLAR,SET,1.5IDX2.25ODX.75SST
64.....	871081000.....	42.00.....	PIN,CLEVIS,W/COTTER PIN
65.....	871081814.....	21.00.....	PIN,ROLL,.313X2.25
66.....	871090146.....	21.00.....	SPRING
67.....	947071040.....	1.00.....	CHAIN,80X53 PITCHES W CONN
68.....	971090337.....	21.00.....	SPR,1.02 DIA X 11,3.92 PSI

40789-07

FRONT HOPPER ASSY,16 FT

0.....	72565-063.....	2.00.....	HOSE,12,12FJX-12FJX,2250
0.....	6104.....	1.00.....	BEARING,PB,P224 1.50 B
1.....	107000672.....	23.00.....	ROD,W/M W/2 CLEVIS'S
2.....	208712192.....	2.00.....	BEARING ASSY
3.....	32956.....	28.00.....	FITT,LUBE,STR,.188 DRIVE
4.....	40074.....	1.00.....	SPROCKET,REWORK,.313 KEYWAY
5.....	40582.....	1.00.....	SPREADROLL REAR SEAL,16
6.....	40655.....	23.00.....	HANDLE,GATE LEVER
7.....	40668.....	23.00.....	GATE LATCH PLATE W/M

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ITEM	PART NO.	QTY	DESCRIPTION
8.....	40738.....	5.00.....	BEARING BLOCK,FRONT HOPPER
9.....	40784-07.....	1.00.....	FRONT HOPPER W/M,16
10.....	40790.....	1.00.....	AUGER SHAFT,LH
11.....	40791.....	1.00.....	ADJUSTER PLATE
12.....	40792.....	2.00.....	WEAR PLATE
13.....	40793.....	1.00.....	BAR,.500X1.25X13.50,W/HOLES
14.....	40794-01.....	1.00.....	KEY,SQ,.375X3.25
15.....	40795.....	14.00.....	WEAR BAR,6 GATE
16.....	40796.....	9.00.....	WEAR BAR,12 GATE
18.....	40798-04.....	1.00.....	GATE HINGE ROD,1 OD X 88.00
18.....	40798-06.....	1.00.....	GATE HINGE ROD,1 OD X 106.00
19.....	40799.....	1.00.....	ADJUSTMENT ROD W/M
20.....	40800.....	23.00.....	GATE LATCH FLANGE W/M
21.....	40846.....	1.00.....	AUGER SHAFT W/M,RH
22.....	40849-07.....	2.00.....	SEGREGATION SCREEN W/M,16
23.....	40850.....	1.00.....	BEARING & SPROCKET ASSY
24.....	40858.....	4.00.....	GATE W/M,12
25.....	40857.....	5.00.....	GATE W/M,12,WITH PIVOT
26.....	40859.....	14.00.....	GATE W/M,6
27.....	40867-07.....	1.00.....	SPREADROLL W/M,16
28.....	40583.....	1.00.....	AUGER W/M,RIGHT,16FT HOPPER
28.....	40646.....	1.00.....	SHAFT,CENTER AUGER W/M
28.....	40652.....	1.00.....	AUGER W/M,LH,16FT HOPPER
29.....	40872-07.....	1.00.....	ACTUATING SHAFT,16
30.....	41004.....	1.00.....	SHIELD,SPREAD ROLL,LH
31.....	41005.....	1.00.....	SHIELD,SPREAD ROLL,RH
32.....	41031.....	1.00.....	CHAIN GUARD W/M
33.....	41032.....	1.00.....	PLATE,HOLE COVER,RH
34.....	41033.....	1.00.....	PLATE,HOLE COVER,LH
35.....	72414.....	5.00.....	BEARING,PLASTIC,1.5 SHAFT
36.....	72530.....	1.00.....	SPROCKET,CHAIN,80BS30
37.....	80038.....	101.00.....	NUT,HEX,.375-16
38.....	80040.....	10.00.....	NUT,HEX,.500-13
39.....	80074.....	23.00.....	NUT,HEX,JAM,.375-16
40.....	80142.....	114.00.....	WASHER,TYPE A PLAIN,.375
41.....	80162.....	101.00.....	WASHER,SPLIT LOCK,.375
42.....	80164.....	14.00.....	WASHER,SPLIT LOCK,.500
43.....	80186.....	8.00.....	CSHH,.500-13X1.75,GR5
44.....	80224.....	37.00.....	CSHH,.375-16X1.25,GR5
46.....	80255.....	6.00.....	CSHH,.500-13X2.00,GR5
47.....	80301.....	1.00.....	SET S,HSKT,KCUP,.250-20X.500
48.....	80305.....	4.00.....	SET S,HSKT,.375-16X.50
49.....	80336.....	2.00.....	COTTER PIN,.188X1.50
50.....	80354.....	7.00.....	NUT,FLEXLOC,.500-13,FULL,LT
51.....	80403.....	10.00.....	CSHH,.500-13X5.00,GR5
52.....	80778.....	4.00.....	CSHH,.500-13X3.25,GR5
53.....	80831.....	23.00.....	SET S,SQ,.375-16X2.00
54.....	80973.....	23.00.....	SHLDR SCR,.500X1.00X.375-16
55.....	81022.....	8.00.....	CSSFH,.375-16X1.25
56.....	845311009.....	2.00.....	BEARING,FLANGE 1.50,4-BOLT
57.....	848019756.....	2.00.....	PLATE,WEAR

FRONT HOPPER

CSH-173/CSH-202 CHIPSPREADER

REF: 40789

REV: G

ITEM	PART NO.	QTY	DESCRIPTION
58.....	853111043.....	1.00.....	MOTOR, HYDRAULIC
59.....	871020103.....	64.00.....	CRG BOLT, .375-16X1.00, GR5
60.....	871032322.....	6.00.....	CSSFH, 500-13X1.25
61.....	871054100.....	23.00.....	DRIVE SCREW, #14x3/4
62.....	871072703.....	6.00.....	WASHER, LOCK, EXT TOOTH CSK, 500
63.....	871075203.....	28.00.....	COLLAR, SET, 1.5IDX2.25ODX.75SST
64.....	871081000.....	46.00.....	PIN, CLEVIS, W/COTTER PIN
65.....	871081814.....	23.00.....	PIN, ROLL, .313X2.25
66.....	871090146.....	23.00.....	SPRING
67.....	947071040.....	1.00.....	CHAIN, 80X53 PITCHES W CONN
68.....	971090337.....	23.00.....	SPR, 1.02 DIA X 11, 3.92 PSI
40789-08			FRONT HOPPER ASSY, 13 FT
1.....	107000672.....	18.00.....	ROD, W/M W/2 CLEVIS'S
2.....	208712192.....	2.00.....	BEARING ASSY
3.....	32956.....	22.00.....	FITT, LUBE, STR, .188 DRIVE
4.....	40074.....	1.00.....	SPROCKET, REWORK, .313 KEYWAY
5.....	41104.....	1.00.....	SPREADROLL REAR SEAL, 13
6.....	40655.....	18.00.....	HANDLE, GATE LEVER
7.....	40668.....	18.00.....	GATE LATCH PLATE W/M
8.....	40738.....	5.00.....	BEARING BLOCK, FRONT HOPPER
9.....	40784-08.....	1.00.....	FRONT HOPPER W/M, 13
10.....	40790.....	1.00.....	AUGER SHAFT, LH
11.....	40791.....	1.00.....	ADJUSTER PLATE
12.....	40792.....	2.00.....	WEAR PLATE
13.....	40793.....	1.00.....	BAR, .500X1.25X13.50, W/HOLES
14.....	40794-01.....	1.00.....	KEY, SQ, .375X3.25
15.....	40795.....	10.00.....	WEAR BAR, 6 GATE
16.....	40796.....	8.00.....	WEAR BAR, 12 GATE
18.....	40798-02.....	1.00.....	GATE HINGE ROD, 1 OD X 76.00
18.....	40798-03.....	1.00.....	GATE HINGE ROD, 1 OD X 82.00
19.....	40799.....	1.00.....	ADJUSTMENT ROD W/M
20.....	40800.....	18.00.....	GATE LATCH FLANGE W/M
21.....	40846.....	1.00.....	AUGER SHAFT W/M, RH
22.....	40849-03.....	1.00.....	SEGREGATION SCREEN W/M, 12
22.....	40849-05.....	1.00.....	SEGREGATION SCREEN W/M, 14
23.....	40850.....	1.00.....	BEARING & SPROCKET ASSY
24.....	40858.....	4.00.....	GATE W/M, 12
25.....	40857.....	4.00.....	GATE W/M, 12, WITH PIVOT
26.....	40859.....	10.00.....	GATE W/M, 6
27.....	40867-08.....	1.00.....	SPREADROLL W/M, 13
28.....	40870-08.....	1.00.....	AUGER W/M, 13
29.....	40872-08.....	1.00.....	ACTUATING SHAFT, 13
30.....	41004.....	1.00.....	SHIELD, SPREAD ROLL, LH
31.....	41005.....	1.00.....	SHIELD, SPREAD ROLL, RH
32.....	41031.....	1.00.....	CHAIN GUARD W/M
33.....	41032.....	1.00.....	PLATE, HOLE COVER, RH
34.....	41033.....	1.00.....	PLATE, HOLE COVER, LH
35.....	72414.....	5.00.....	BEARING, PLASTIC, 1.5 SHAFT
36.....	72530.....	1.00.....	SPROCKET, CHAIN, 80BS30

REF: 40789

REV: G

ITEM	PART NO.	QTY	DESCRIPTION
37	80038	85.00	NUT,HEX,,375-16
38	80040	10.00	NUT,HEX,,500-13
39	80074	18.00	NUT,HEX,JAM,,375-16
40	80142	94.00	WASHER,TYPE A PLAIN,,375
41	80162	85.00	WASHER,SPLIT LOCK,,375
42	80164	14.00	WASHER,SPLIT LOCK,,500
43	80186	8.00	CSHH,,500-13X1.75,GR5
44	80224	33.00	CSHH,,375-16X1.25,GR5
46	80255	4.00	CSHH,,500-13X2.00,GR5
47	80301	1.00	SET S,HSKT,KCUP,.250-20X.500
48	80305	4.00	SET S,HSKT,,375-16X.50
49	80336	2.00	COTTER PIN,,188X1.50
50	80354	3.00	NUT,FLEXLOC,,500-13,FULL,LT
51	80403	10.00	CSHH,,500-13X5.00,GR5
52	80778	2.00	CSHH,,500-13X3.25,GR5
53	80831	18.00	SET S,SQ,,375-16X2.00
54	80973	18.00	SHLDR SCR,,500X1.00X.375-16
55	81022	8.00	CSSFH,,375-16X1.25
56	845311009	2.00	BEARING,FLANGE 1.50,4-BOLT
57	848019756	2.00	PLATE,WEAR
58	853111043	1.00	MOTOR,HYDRAULIC
59	871020103	52.00	CRG BOLT,,375-16X1.00,GR5
60	871032322	6.00	CSSFH,,500-13X1.25
61	871054100	18.00	DRIVE SCREW,#14x3/4
62	871072703	6.00	WASHER,LOCK,EXT TOOTH CSK,,500
63	871075203	23.00	COLLAR,SET,1.5IDX2.25ODX.75SST
64	871081000	32.00	PIN,CLEVIS,W/COTTER PIN
65	871081814	18.00	PIN,ROLL,,313X2.25
66	871090146	18.00	SPRING
67	947071040	1.00	CHAIN,80X53 PITCHES W CONN
68	971090337	18.00	SPR,1.02 DIA X 11,3.92 PSI
40789-09			FRONT HOPPER ASSY,14.5 FT
1	107000672	20.00	W/M,ROD,W/2 CLEVIS'S,W/LINK
2	208712192	2.00	BEARING ASSY,1.50 BORE,STEP
3	853750102	24.00	FITT,LUBE,STR,.250-28
4	40074	1.00	SPROCKET,80FB12,.313 KEYWAY
5	41267	1.00	SPREADROLL SEAL,14.5 HOPPER
6	40655	20.00	HANDLE,GATE LEVER
7	40668	20.00	W/M,GATE LATCH PLATE
8	40738	5.00	BEARING BLOCK
9	40784-09	1.00	FRONT HOPPER W/M,14.5
10	40790	1.00	AUGER SHAFT,LH
11	40791	1.00	ADJUSTER PLATE
12	40792	2.00	WEAR PLATE
13	40793	1.00	BAR,,500X1.25X13.50,W/HOLES
14	40794-01	1.00	KEY,SQ,,375X3.25
15	40795	11.00	WEAR BAR,6 GATE
16	40796	9.00	WEAR BAR,12 GATE
18	40798-03	1.00	GATE HINGE ROD,1 OD X 82.00
19	40799	1.00	ADJUSTMENT ROD W/M

FRONT HOPPER

CSH-173/CSH-202 CHIPSPREADER

REF: 40789

REV: G

ITEM	PART NO.	QTY	DESCRIPTION
20.....	40800.....	20.00.....	W/M,GATE LATCH FLANGE
21.....	40846.....	1.00.....	AUGER SHAFT W/M,RH
22.....	40849-05.....	1.00.....	SEGREGATION SCREEN W/M,14
22.....	40849-06.....	1.00.....	SEGREGATION SCREEN W/M,15
23.....	40850.....	1.00.....	BEARING & SPROCKET ASSY
24.....	40858.....	4.00.....	W/M,GATE,12"
25.....	40857.....	5.00.....	W/M,GATE 12",WITH PIVOT
26.....	40859.....	11.00.....	W/M,GATE,6
27.....	40867-09.....	1.00.....	SPREADROLL W/M,14.5 HOPPER
28.....	40870-09.....	1.00.....	AUGER W/M,14.5
29.....	40872-09.....	1.00.....	ACTUATING SHAFT,14.5 HOPPER
30.....	41004.....	1.00.....	SHIELD,SPREAD ROLL,LH
31.....	41005.....	1.00.....	SHIELD,SPREAD ROLL,RH
32.....	41031.....	1.00.....	CHAIN GUARD W/M
33.....	41032.....	1.00.....	PLATE,HOLE COVER,RH
34.....	41033.....	1.00.....	PLATE,HOLE COVER,LH
35.....	72414.....	5.00.....	BRNG,NYLON,1.5 SHAFT
36.....	72530.....	1.00.....	SPROCKET,CHAIN,80BS30
37.....	80038.....	91.00.....	NUT,HEX,.375-16
38.....	80040.....	10.00.....	NUT,HEX,.500-13
39.....	80074.....	20.00.....	NUT,HEX,JAM,.375-16
40.....	80142.....	102.00.....	WASHER,TYPE A PLAIN,.375
41.....	80162.....	91.00.....	WASHER,SPLIT LOCK,.375
42.....	80164.....	20.00.....	WASHER,SPLIT LOCK,.500
43.....	80186.....	8.00.....	CSHH,.500-13X1.75,GR5
44.....	80224.....	35.00.....	CSHH,.375-16X1.25,GR5
46.....	80255.....	4.00.....	CSHH,.500-13X2.00,GR5
47.....	80301.....	1.00.....	SET S,HSKT,KCUP,.250-20X.500
48.....	80305.....	4.00.....	SET S,HSKT,.375-16X.50
49.....	80336.....	2.00.....	COTTER PIN,.188X1.50
50.....	80354.....	3.00.....	NUT,FLEXLOC,.500-13,FULL,LT
51.....	80403.....	10.00.....	CSHH,.500-13X5.00,GR5
52.....	80778.....	2.00.....	CSHH,.500-13X3.25,GR5
53.....	80831.....	20.00.....	SET S,SQ,.375-16X2.00
54.....	80973.....	20.00.....	SHLDR SCR,.500X1.00X.375-16
55.....	81022.....	8.00.....	CSFHS,.375-16X1.25
56.....	845311009.....	2.00.....	BEARING,FLANGE,1.50,4 BOLT
57.....	848019756.....	2.00.....	PLATE,WEAR
59.....	871020103.....	56.00.....	CRG BOLT,.375-16X1.00,GR5
60.....	80250.....	6.00.....	CSHH,.500-13X1.25,GR5
61.....	871054100.....	20.00.....	DRIVE SCREW,#14x3/4
63.....	871075203.....	25.00.....	COLLAR,SET,1.5IDX2.25ODX.75SST
64.....	871081000.....	40.00.....	PIN,CLEVIS,W/COTTER PIN
65.....	871081814.....	20.00.....	ROLL PIN,.313X2.25
66.....	871090146.....	20.00.....	SPRING
67.....	947071040.....	1.00.....	CHAIN,80X52 PITCHES W CONN&OFF
68.....	971090337.....	20.00.....	SPR,1.02 DIA X 11,3.92 PSI
69.....	R48-1.....	6.00.....	WASHER,FLAT,1.50X1.031X.062
70.....	R48-2.....	6.00.....	WASHER,FLAT,1.50X1.031X.075
71.....	R48-3.....	6.00.....	WASHER,FLAT,1.50X1.031X.125
72.....	40798-05.....	1.00.....	GATE HINGE ROD,1 OD X 94.00

REF: See List

REV:

ITEM	PART NO.	QTY	DESCRIPTION
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4WD UNIT USES 4 OF ITEM #42114

42114		TIRE & RIM GROUP,385/65R 22.5 J	
1	42113	1.00	RIM W/M,22.5X12.25,11.46 PILOT
2	72758	1.00	TIRE,RADIAL,385/65R22.5
3	72760	1.00	TIRE VALVE,TUBELESS,3.13 LG

2WD UNIT USES 2 OF ITEM #42114 AND 2 OF ITEM #42299

42299		TIRE & RIM GROUP,385/65R 22.5	
1	72760	1.00	TIRE VALVE,TUBELESS,3.13 LG
2	73231	1.00	RIM 22.5X12.25,11.25BC,4.0 OS
3	72758	1.00	TIRE,RADIAL,385/65R22.5

40422		FRONT FENDER GROUP,DUPLEX	
0	206002648	1.00	BRACE,FRONT FENDER
0	40421	1.00	FENDER,FRONT,DUPLEX TIRES
0	80221	6.00	CSHH,.375-16X1.00,GR5
0	80352	6.00	NUT,FLEXLOC,.375-16,FULL,LT

42294		HYD BRAKE GRP,2WD	
1	73219	1.00	ROLLER,CAM,1.00 OD X .625W
2	73225	1.00	ACCUMULATOR,PISTON,183 CU.IN.
3	73226	1.00	VLV,HYD,MODULATING,BRAKE
4	73227	1.00	VLV,HYD,ACCUMULATOR CHARGE
5	73228	1.00	SWITCH,LOW PRESSURE,1500 PSI
6	73269	1.00	KIT,HOSE/FITT,REAR BRAKES,2WD

(See Detail Opposite)

209214001 **BELT,CONVEYOR 37'6" W/SPLICE**

90384 **OIL,SAE 15W-40,CH-4**

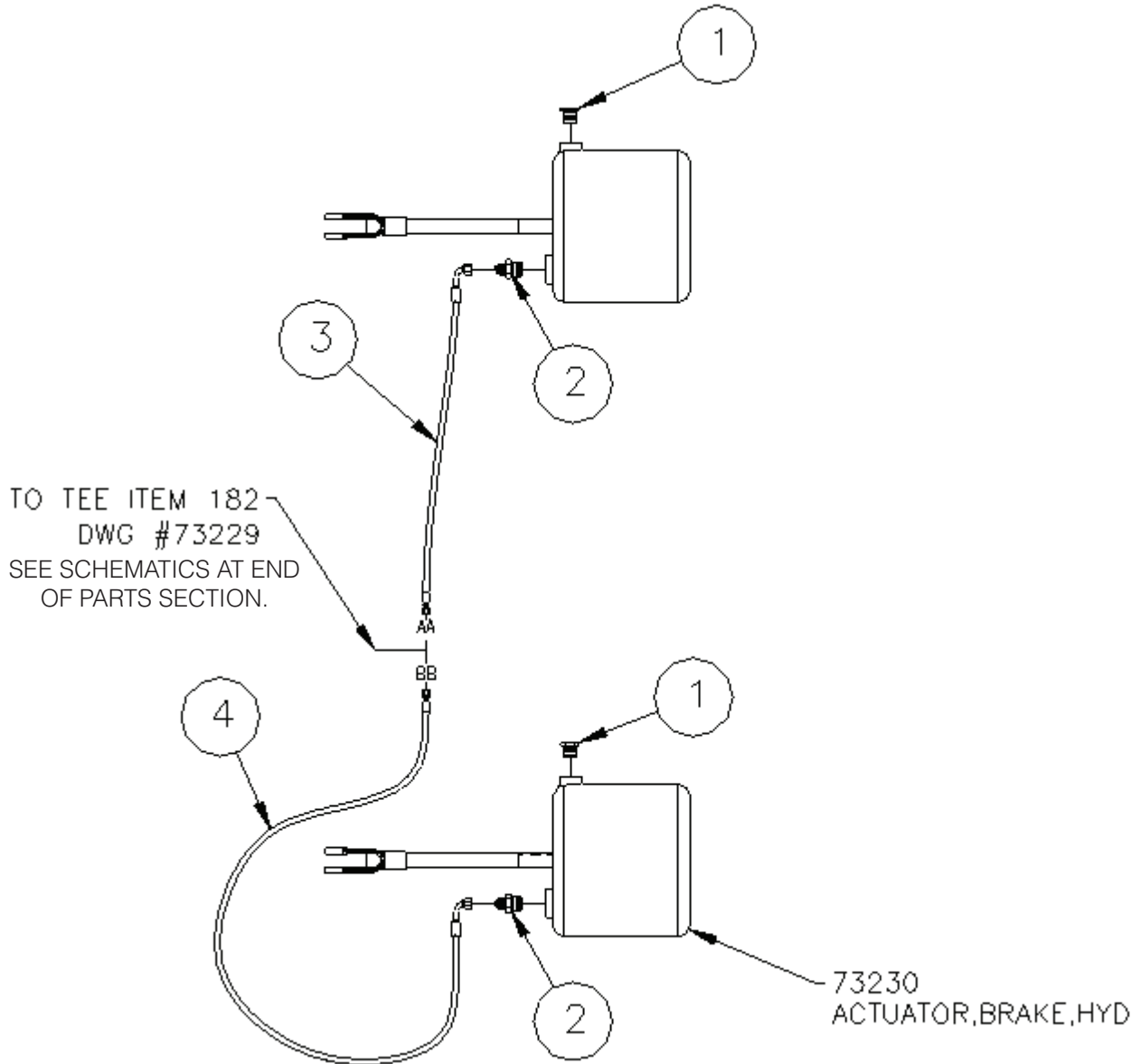
90599 **ANTIFREEZE**

91500 **OIL,HYDRAULIC,ISO68**

REF: 73269

REV: 0

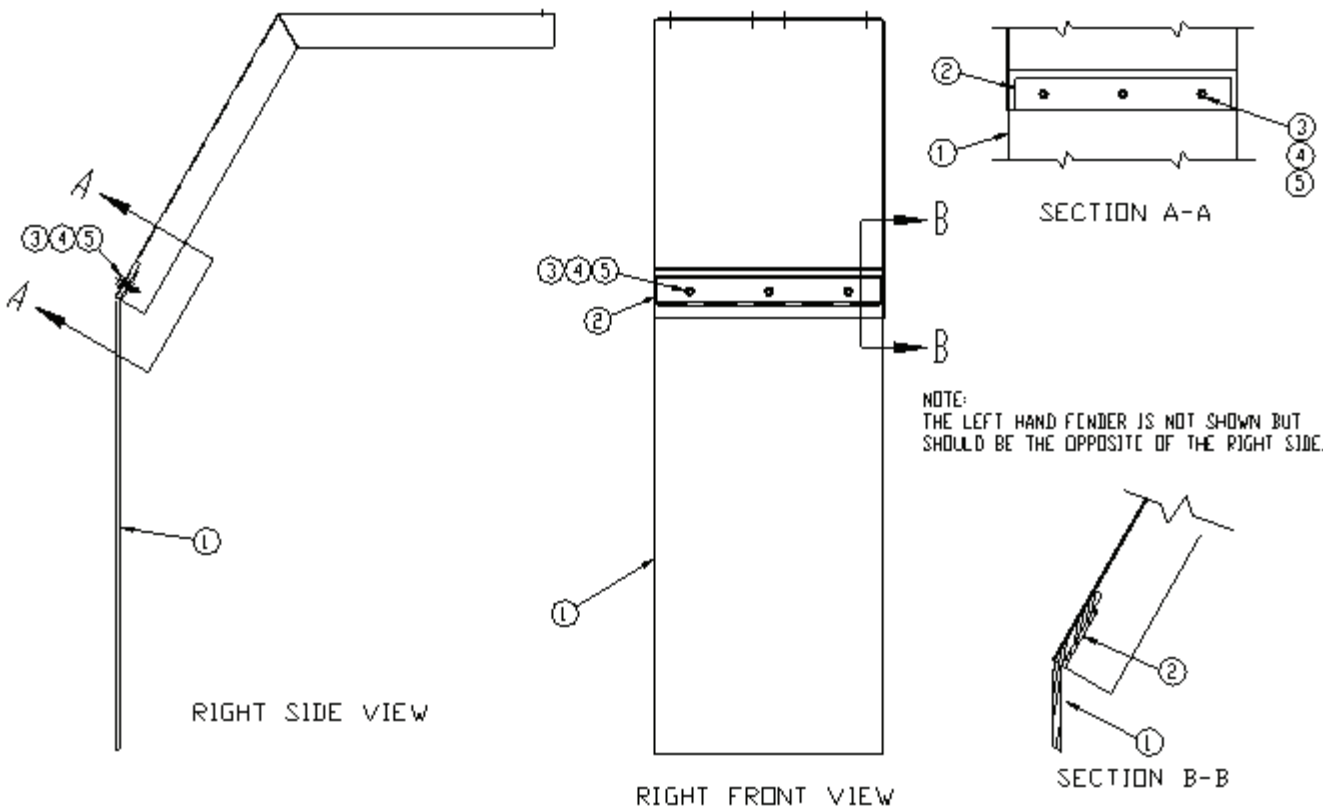
ITEM	PART NO.	QTY	DESCRIPTION
	73269		KIT,HOSE/FITT,REAR BRAKES,2WD
1.....	39101.....	2.00.....	FITT,PLUG 03MB,SKT
2.....	70062.....	2.00.....	FITT,STR 08MJ-08MB
3.....	72555-011.....	1.00.....	HOSE,08,08FJX-08RJ90,3000
4.....	72555-028.....	1.00.....	HOSE,08,08FJX-08RJ90,3000



REF: 41247

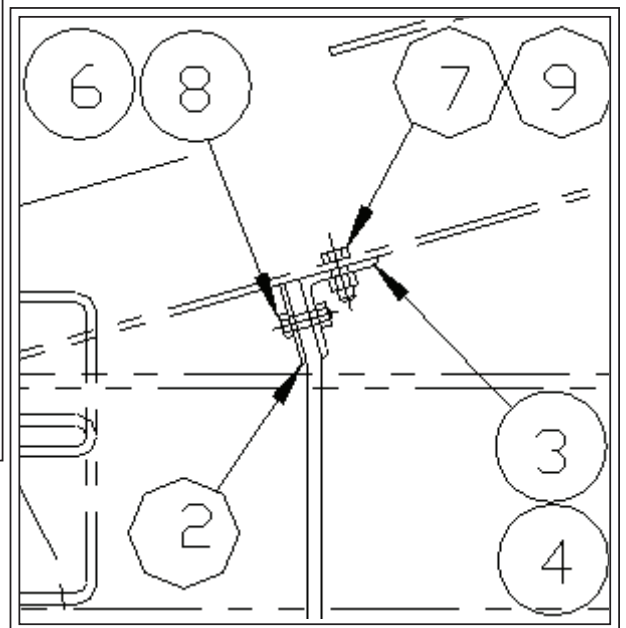
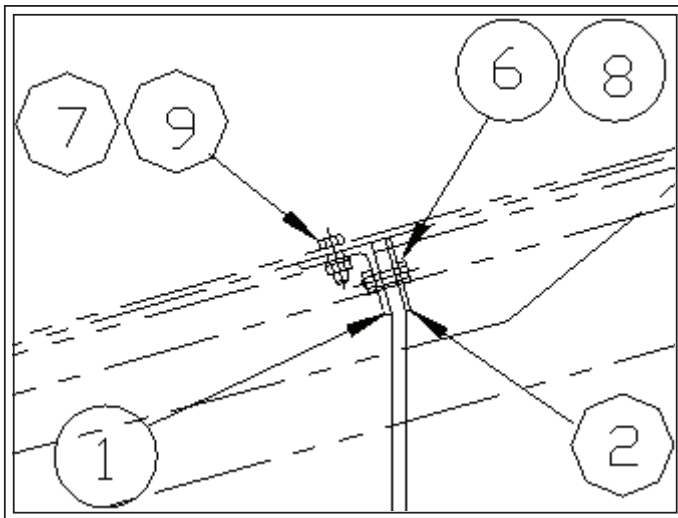
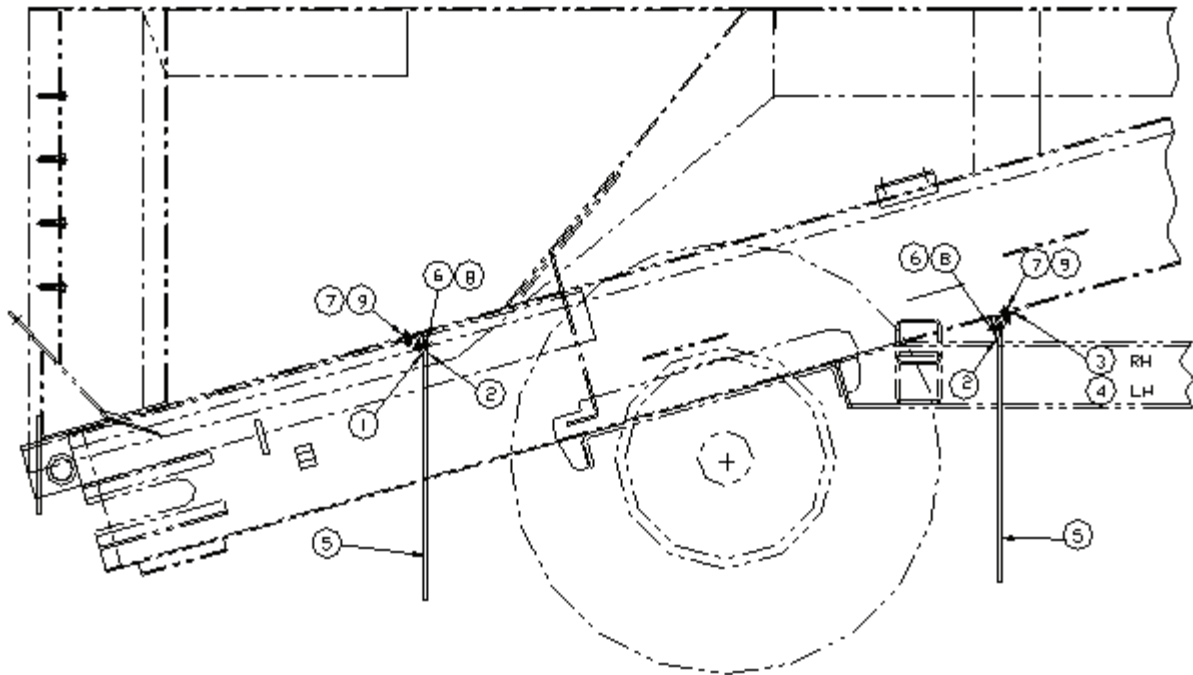
REV: 0

ITEM	PART NO.	QTY	DESCRIPTION
			41247 FRONT MUD FLAP GROUP (OPTION)
1	41048	2.00	MUD FLAP REWORK,14X30
2	41049	2.00	MOUNT BAR,MUD FLAP
3	80141	6.00	WASHER,TYPE A PLAIN,.312
4	80208	6.00	CSHH,.312-18X1.00,GR5
5	80351	6.00	NUT,FLEXLOC,.312-18,FULL,LT



REF: 41248
 REV: 0

ITEM	PART NO.	QTY	DESCRIPTION
	41248		REAR MUD FLAP GROUP (OPTION)
1	41250	2.00	ANGLE,REAR MUD FLAP MOUNT
2	41251	4.00	MOUNT BAR,MUD FLAP,REAR
3	41252	1.00	ANGLE,FR RH,REAR MUD FLAP MNT
4	41253	1.00 </td <td>ANGLE,FR LH,REAR MUD FLAP MNT</td>	ANGLE,FR LH,REAR MUD FLAP MNT
5	41254	4.00	MUD FLAP REWORK,20WX24
6	80208	16.00	CSHH,.312-18X1.00,GR5
7	80221	8.00	CSHH,.375-16X1.00,GR5
8	80351	16.00	NUT,FLEXLOC,.312-18,FULL,LT
9	80352	8.00	NUT,FLEXLOC,.375-16,FULL,LT



REF: See List

REV:

ITEM	PART NO.	QTY	DESCRIPTION
	40939-01	1.00	FRONT HOPPER RAILING,10
	40939-02	1.00	FRONT HOPPER RAILING,11
	40939-03	1.00	FRONT HOPPER RAILING,12
	40939-04	1.00	FRONT HOPPER RAILING,13.5
	40939-05	1.00	FRONT HOPPER RAILING,14
	40939-06	1.00	FRONT HOPPER RAILING,15
	40939-07	1.00	FRONT HOPPER RAILING,16
	40939-08	1.00	FRONT HOPPER RAILING,14.5
	40939-09	1.00	FRONT HOPPER RAILING,13
	41018-01	1.00	PLACEMENT SCREEN ASSY, 10
	41018-02	1.00	PLACEMENT SCREEN ASSY, 11
	41018-03	1.00	PLACEMENT SCREEN ASSY, 12
	41018-04	1.00	PLACEMENT SCREEN ASSY, 13
	41018-05	1.00	PLACEMENT SCREEN ASSY, 13.5
	41018-06	1.00	PLACEMENT SCREEN ASSY, 14
	41018-07	1.00	PLACEMENT SCREEN ASSY, 15
	41018-08	1.00	PLACEMENT SCREEN ASSY, 14.5
	41018-09	1.00	PLACEMENT SCREEN ASSY, 16
	41035-01	1.00	SECOND AGITATOR ASSY,10
	41035-02	1.00	SECOND AGITATOR ASSY,11
	41035-03	1.00	SECOND AGITATOR ASSY,12
	41035-04	1.00	SECOND AGITATOR ASSY,13.5
	41035-05	1.00	SECOND AGITATOR ASSY,14
	41035-06	1.00	SECOND AGITATOR ASSY,15
	41035-07	1.00	SECOND AGITATOR ASSY, 13
	41035-08	1.00	SECOND AGITATOR ASSY, 16

REF: See List

REV:

ITEM	PART NO.	QTY	DESCRIPTION
	40623		BATTERY DISCONNECT GROUP (OPTION)
0.....	40626.....	1.00.....	PLATE, SWITCH MOUNTING
0.....	5804.....	1.00.....	CABLE, BATTERY, 2 LUG, 0GAX13
0.....	72254.....	1.00.....	SWITCH, BATTERY DISCONNECT
0.....	R443.....	2.00.....	CABLE, BATTERY, POS, 28, 4GA, .406

REF: See List

REV:

ITEM	PART NO.	QTY	DESCRIPTION
40299			VANDALISM PACKAGE (OPTION)
0	16131	1.00	LOCK BAR,RADIATOR COVER
0	40300	1.00	RADIATOR COVER, W/M
0	72011	7.00	PADLOCK, W/KEYS
40657			STROBE GROUP WITH MOUNT (OPTION)
0	000200190	1.00	SWITCH,TOGGLE,SPST,2-POS
0	33602	2.00	CONN,BUTT,16-14 GA
0	40667	1.00	STROBE MOUNT W/M
0	71060	18.00	LOOM,SPLIT,CONVOLUTED,.250
0	71062	18.00	WIRE,14 GA,BLUE
0	71938	1.00	LIGHT,STROBE,AMBER
71528			LAMP, LICENSE (OPTION)
71529			BRACKET, W/LIGHT (OPTION)

REF: See List

REV:

ITEM	PART NO.	QTY	DESCRIPTION
41702			FIRE EXTINGUISHER GRP (OPTION)
1	41700	1.00	BRK'T,FIRE EXTINGUISHER
2	35272	1.00	FIRE EXTINGUISHER, 20 LB DRY C
3	35775	1.00	MOUNT BRACKET, 20# FIRE EXTING
4	80221	8.00	CSHH,.375-16X1.00,GR5
5	80230	4.00	CSHH,.375-16X2.00,GR5
6	80162	12.00	WASHER,SPLIT LOCK,.375
7	80038	12.00	NUT,HEX,.375-16
108061115			SEAL,STEMCO AXLE (OPTION)
0	946170957	2.00	SEAL,HUB AND GASKET
0	946170958	2.00	SEAL,HUB, AXLE RING
40479			KIT,FAST LUBE OIL CHANGE (OPTION)
0	19096	1.00	BRACKET,12 BHD UNION
0	35492	1.00	FITT,STR 12MJ-12MJ,BHD
0	35540	1.00	FITT,STR 12MP-12FJX
0	36303	1.00	FITT,STR 08MJ-M18,METRIC
0	72368	1.00	HOSE ASSY,-10 x 24,1750
0	853182304	1.00	FITT,QD -12 FP,SET
0	853182305	1.00	CAP,DUST,12 QD
0	33900	1.00	FITT,90 08MJ-08FJX
40534			DECAL, PREV. MAINTENANCE & LUBE (OPTION)
73049			PRECLEANER,TURBO II,5.00 ID (OPTION)
73153			UMBRELLA, CANVAS W/MOUNT (OPTION)
40166			BELT ASSEMBLY,HOT OIL, 20 X 449 (OPTION)
0	72168	1.00	CONV BELT, HOT OIL, 20 X 449
0	948022317	1.00	KIT,BELT LACING
72276			BELT ASSY, CHEVRON CONVEYOR (OPTION)

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ADJUST BAR W/M,RH	8	BRACKET,QUICK COUPLER	28
ADJUSTER PLATE	36	BRACKET,RELAY MOUNT	6
ADJUSTING PLATE W/M	32	BRACKET, W/LIGHT	58
ADJUSTMENT ROD W/M	38	BRAKE,HYD,WET,5400 LB	21
ALARM,BACKUP,97DB	2	BREATHER,04-MP	27
ANCHOR,STEP GRATING	2	BREATHER,TRACK TENSION CYL	25
ANGLE,FR LH,REAR MUD FLAP MNT	55	BRG,1.44,2-BOLT FLANGE	8
ANGLE,FR RH,REAR MUD FLAP MNT	55	BRK'T,FIRE EXTINGUISHER	59
ANGLE,REAR MUD FLAP MOUNT	55		
ANTIFREEZE	52	C	
ARM,FRONT GATE CONTROL	36	CABLE,BATTERY,2 LUG,0GAX13	57
ARM, PADDLE SWITCH	31	CABLE,BATTERY,NEG,14",EYE/POST	13
ARM, UPPER PADDLE	31	CABLE,BATTERY,NEG,17",EYE/EYE	13
ASSY,ENG CURTAIN,SPRHH-F	10	CABLE,BATTERY,POS,28,4GA,.406	57
AUGER SHAFT,LH	36	CABLE,BATTERY,POS,60",EYE/POST	13
AUGER SHAFT W/M,RH	38	CAP,DUST,12 QD	29, 59
AUGER W/M,10 38		CAP,END,OMNI GEAR	23
AUTO-CONVEYOR PADDLE ASSY	31	CAP,LOCKOUT,OMNI GEAR	23
AXLE,DRIVE/STEER,77.50 TRACK	17	CAP & RING ASSY	8
AXLE,TRAILER,96",22,500#	19	CAPSCREW,.50-13 UNCX 2,GR5	34
		CAP W/STRAINER,HYD FILLER	16
		CENTER HANDRAIL,W/M	8
		CHAIN,80X52 PITCHES W CONN&OFF	38
B		CHAIN GUARD W/M	36, 38
BALL JOINT,.500-20	27	CHAIN,SASH,#35 X 14 LINKS=7.84	8
BALL JOINT,.500,FEMALE,W/STUD	25	CHANNEL W/M, AXLE HSG	21
BAR,.500X1.25X13.50,W/HOLES	36	CHUTE LINING	34
BASE, AXLE MOUNT	19	CIRCUIT BREAKER,05A,PAN MT	6
BATTERY,12V,1000 CRK AMPS	13	CIRCUIT BREAKER,10A,PAN MT	6
BATTERY BOOT,POS(RED)	13	CIRCUIT BREAKER,25A,PAN MT	6
BATTERY BOOT,POS(RED)	12	CLAMP,DUAL HOSE,.75 OD	30
BATTERY DISCONNECT GROUP	57	CLAMP,HOSE,.22-.62,WORM,#04	8
BEARING ASSY,1.50 BORE,STEP	36	CLAMP,HOSE,.44-.78,WORM,#06	12
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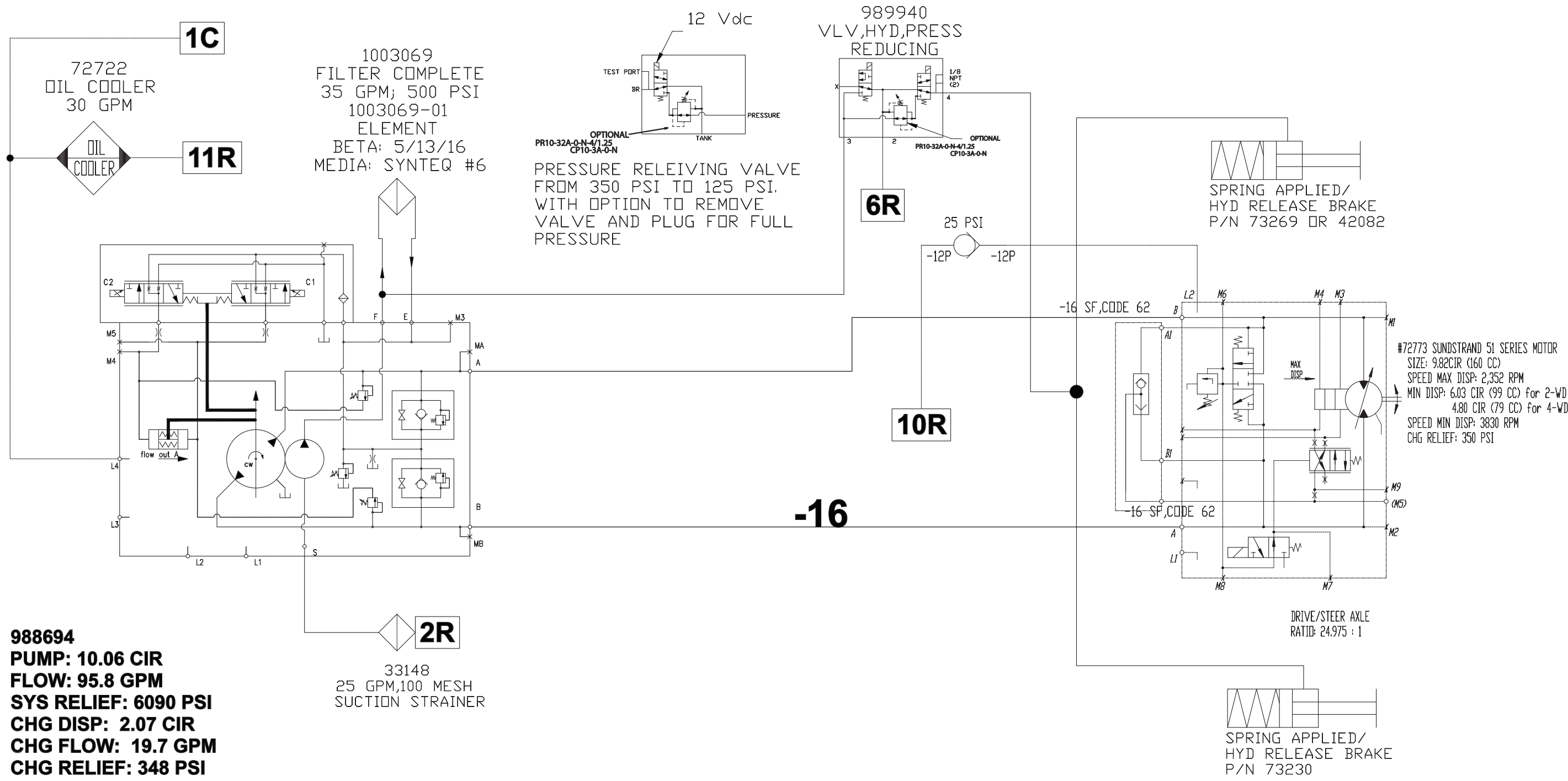
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VLX,CHECK,5 PSI SPRING	15		
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VLX,DO3,DIR CONTROL,12V	15		
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VLX,FLOW CONTROL,PC	15		
VLX,FLOW REQUATOR,ADJ	15		
VLX,HYD,ACCUMULATOR CHARGE	52		
VLX,HYD,DUAL SOL,PRES RED	19		
VLX,HYD,LOAD SENSING	16		
VLX,HYD,MODULATING,BRAKE	52		
VLX,HYD,PRESS RED,CSHF	16		
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VLX,HYD,SOL,3-WAY,NO,-06	21		
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VLX,PRESS RED/RELIEVING	15		
VLX,PRIOTY FLOW DIVIDER	15		
VLX,PROP,PRESS COMP	15		
VLX,RELIEF,500 PSI	15		
VLX,RELIEF,2200 PS	15		
VLX,SHUTTLE	15		
VLX,SOLENOID,2-WAY,NC	15		
W			

Alphabetical Index

NOTES:



988694
PUMP: 10.06 CIR
FLOW: 95.8 GPM
SYS RELIEF: 6090 PSI
CHG DISP: 2.07 CIR
CHG FLOW: 19.7 GPM
CHG RELIEF: 348 PSI

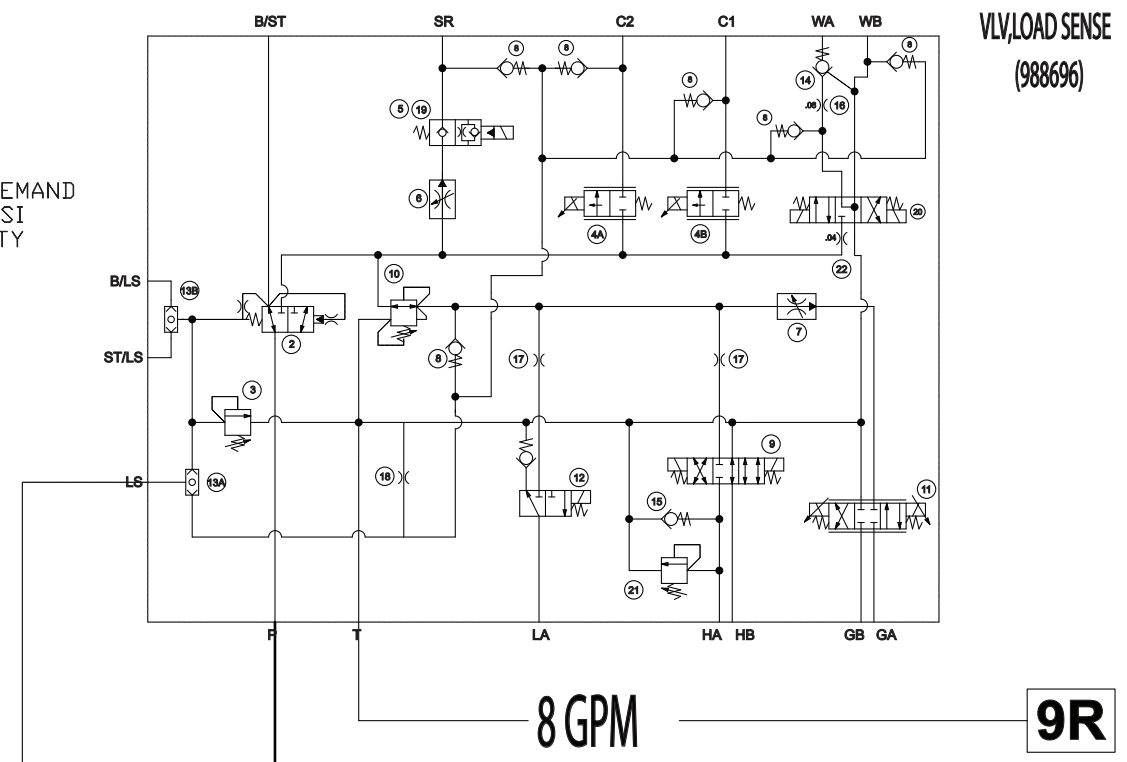
33148
 25 GPM, 100 MESH
 SUCTION STRAINER

2 WHEEL DRIVE SYSTEM

NOTE: ALL PUMP FLOW
 WITH ENGINE RPM @ 2200,
 100% EFF

NOTES	UNLESS OTHERWISE SPECIFIED		DATE		NEW RELEASE
	REV	BY	DATE	DATE	
VT LEEBOY, INC. 500 LINCOLN COUNTY PARISWAY, EXT. LINCOLNTON, NC 28092	1	AT	12/05/07	2776	DESCRIPTION: SCHEMATIC, HYD SYS, TIER 3, CSHF PART NO. 988893 PART WT. LBS
	2	AT	12/05/07		
	3	AAT	12/05/07		

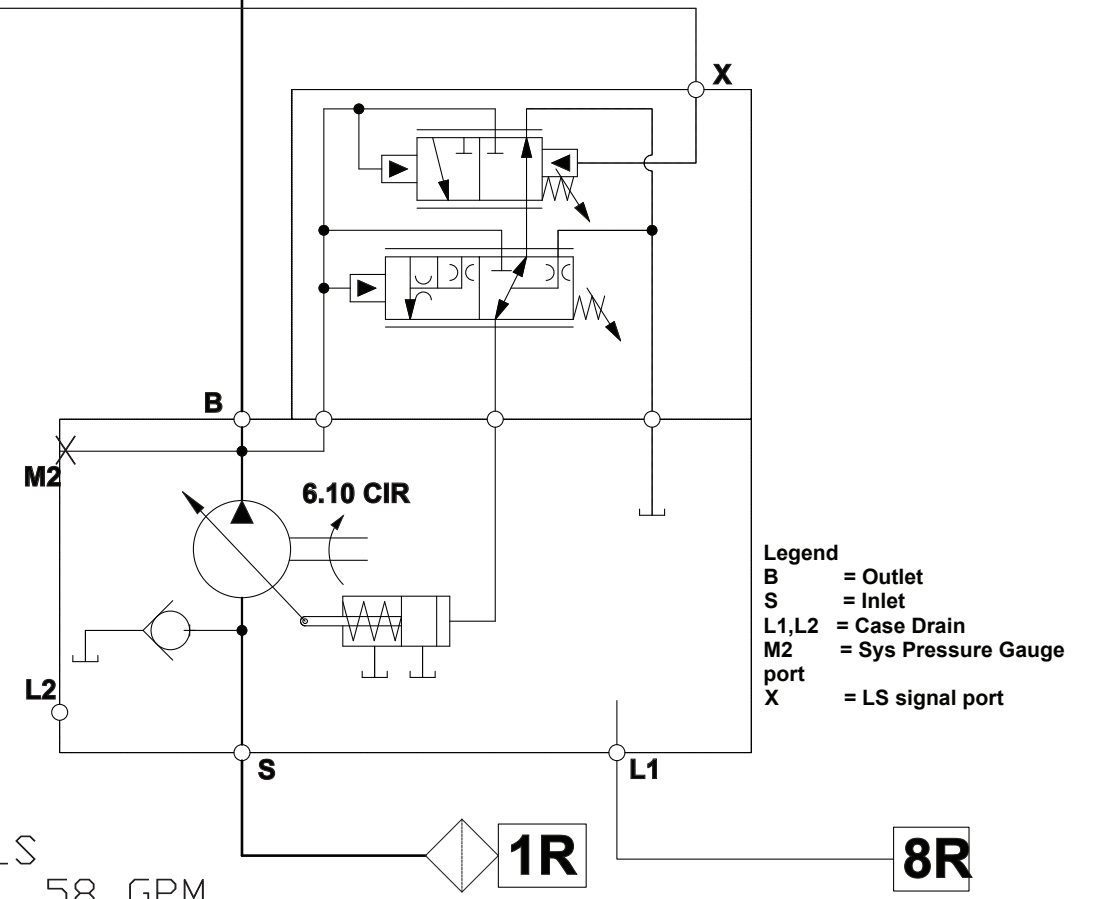
VALVE INFO:
 2 = PRIORITY ON DEMAND
 3 = RELIEF 2500 PSI
 6 = 14 GPM PRIORITY
 7 = 6 GPM
 10 = 1000 PSI
 11 = 300 PSI



VLV,LOAD SENSE
(988696)

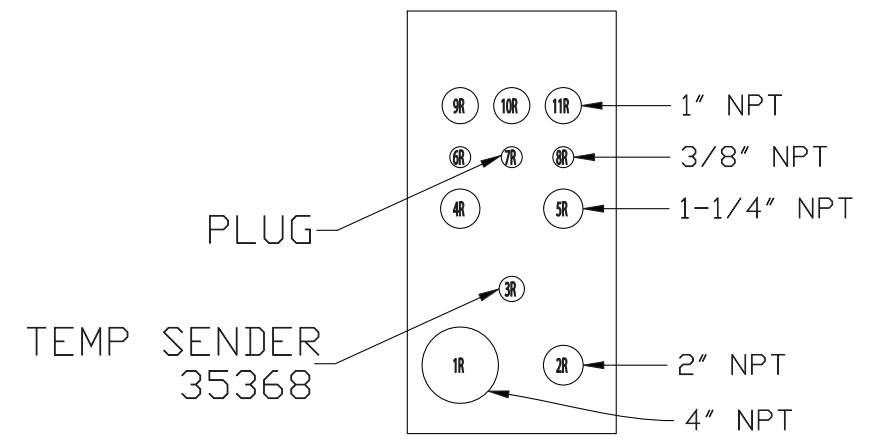
RESERVOIR INSTALLATION

- 1R - 989939 - STRAINER,100 GPM
- 2R - 33148 - STRAINER,25 GPM
- 3R - 35368 - SENDER,HYD TEMP
- 4R - 72543 - FILTER,RETURN,50 GPM
- 5R - X259 - FILTER,RETURN,25 GPM
- 6R - - RETURN PARK BRAKE
- 7R - 38035 - SWITCH,LEVEL (OPTION)
- 8R - - RETURN LOAD SENSE PUMP
- 9R - - MANIFOLD RETURN
- 10R - - MOTOR RETURN
- 11R - - STEERING RETURN



(988695)
 AUX PUMP,LS
 MAX FLOW: 58 GPM

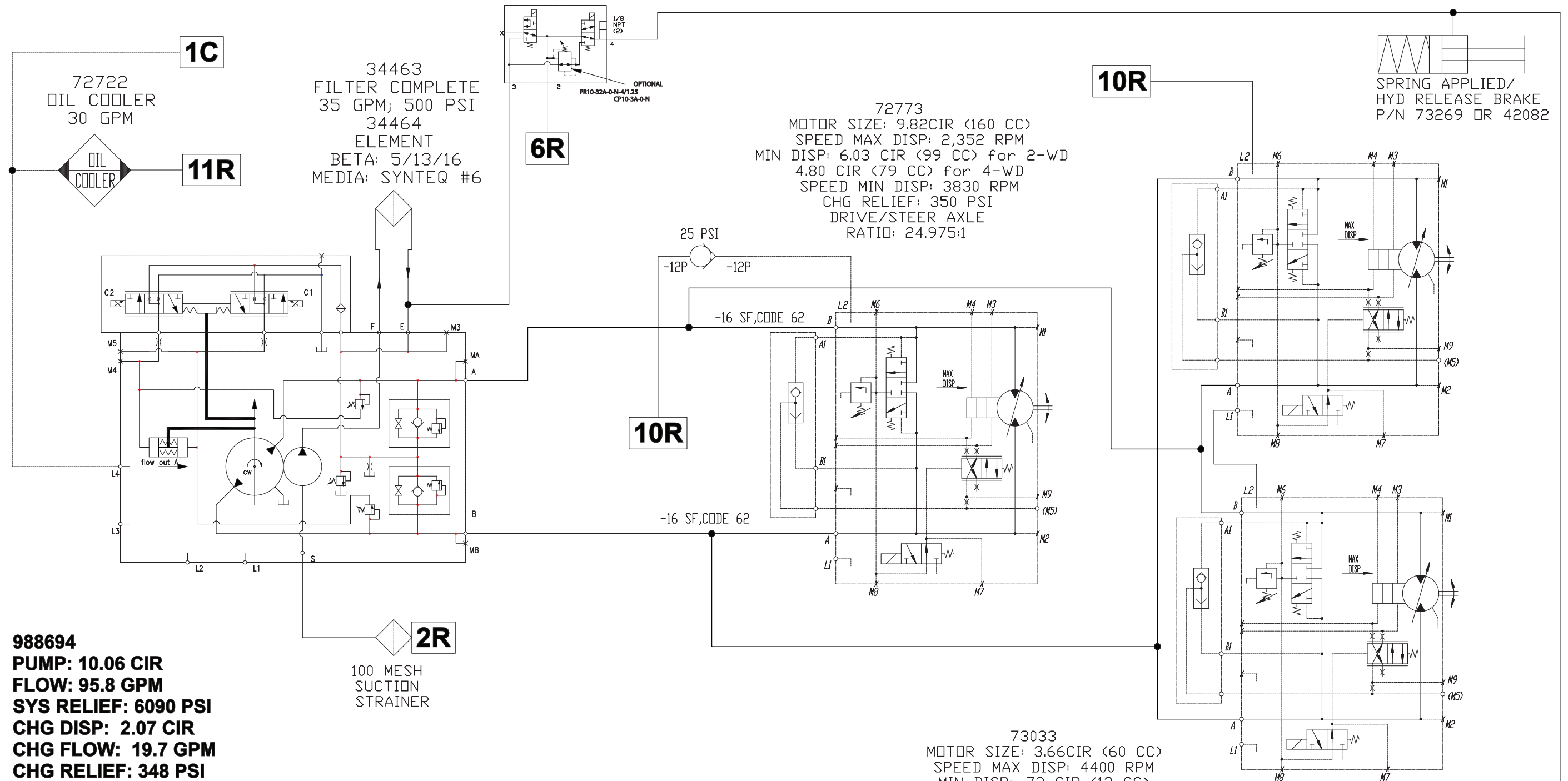
989939
 100 GPM,100 MESH
 SUCTION STRAINER



HYD RESERVOIR
 50 GPM

REV	BY	DATE	DESCRIPTION
1	AAT	12/05/07	NEW RELEASE
2	AT	12/05/07	DESCRIPTION: SCHEMATIC,HYD SYS, TIER 3,CSHF
3	AAT	12/05/07	DESCRIPTION: SCHEMATIC,HYD SYS, TIER 3,CSHF

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES AND APPLY TO FINISHED PARTS
 DIMENSIONS IN PARENTHESES INCLUDE APPROPRIATE TOLERANCES FOR MACHINED PARTS
 TOLERANCES ARE:
 DECIMALS: 0.0015" (0.0015") ANGLES: 30° ± 1/16" R1/2" ± 0.005" SURFACE FINISH: N.I.S.
 INFORMATION CONTAINED ON THIS DRAWING IS THE SOLE PROPERTY OF V.T. LEEBOY, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF V.T. LEEBOY, INC. IS PROHIBITED.
 PART WT. LBS. REV. 2 OF 5



988694
PUMP: 10.06 CIR
FLOW: 95.8 GPM
SYS RELIEF: 6090 PSI
CHG DISP: 2.07 CIR
CHG FLOW: 19.7 GPM
CHG RELIEF: 348 PSI

34463
 FILTER COMPLETE
 35 GPM; 500 PSI
 34464
 ELEMENT
 BETA: 5/13/16
 MEDIA: SYNTEQ #6

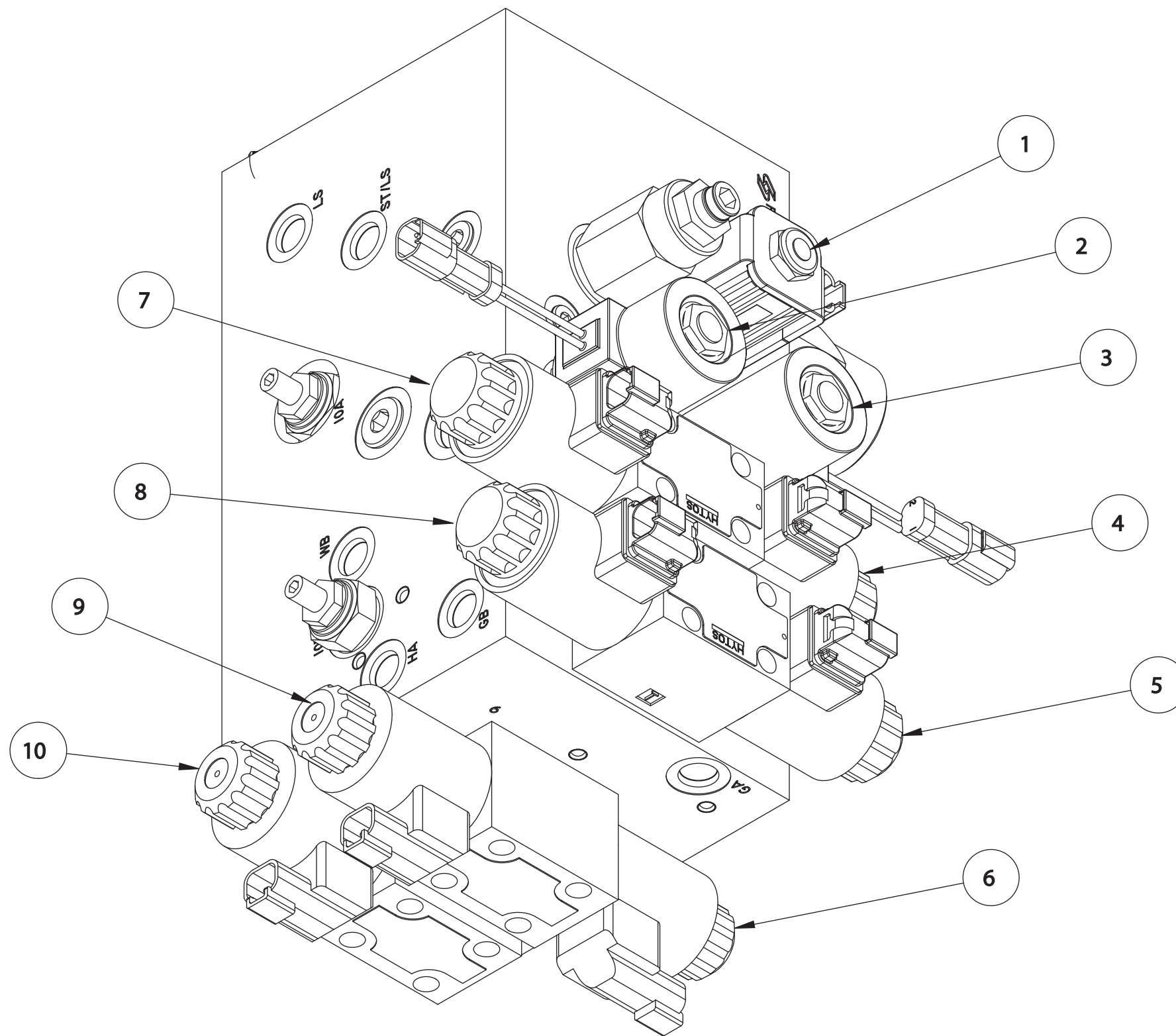
72773
 MOTOR SIZE: 9.82CIR (160 CC)
 SPEED MAX DISP: 2,352 RPM
 MIN DISP: 6.03 CIR (99 CC) for 2-WD
 4.80 CIR (79 CC) for 4-WD
 SPEED MIN DISP: 3830 RPM
 CHG RELIEF: 350 PSI
 DRIVE/STEER AXLE
 RATIO: 24.975:1

73033
 MOTOR SIZE: 3.66CIR (60 CC)
 SPEED MAX DISP: 4400 RPM
 MIN DISP: .73 CIR (12 CC)
 SPEED MIN DISP: 7000 RPM
 CHG RELIEF: 350 PSI
 TORQUE HUB
 RATIO: 23.50:1

4 WHEEL DRIVE SYSTEM

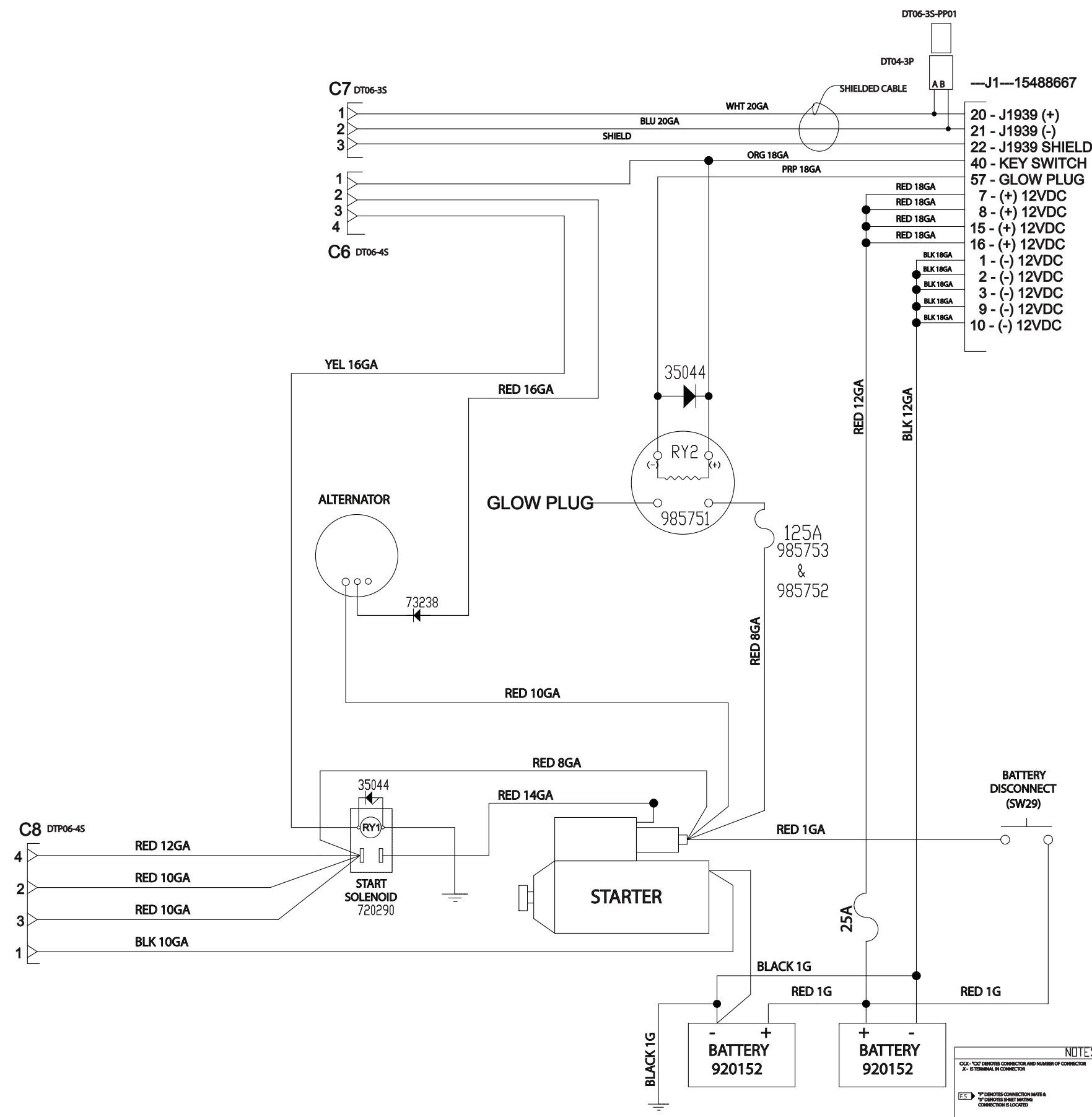
NOTE: ALL PUMP FLOW
 WITH ENGINE RPM @ 2200,
 100% EFF

PROCEDURE & OPERATION		UNLESS OTHERWISE SPECIFIED		NEW RELEASE	
1. CHANGE MIN/MAX DISPLACEMENT ON FRONT MOTOR.	1. UNLESS OTHERWISE SPECIFIED	A	AAT	12/05/07	2776
2. ADDED TORQUE HUB, BRAKE & MOTORS TO REAR AXLE.	2. DIMENSIONS ARE IN INCHES	BY	AT	12/05/07	FOR
3. THE REAR MOTORS WILL REMAIN IN MIN DISPLACEMENT UNTIL A TOGGLE SWITCH ON THE CONTROL PANEL IS ACTIVATED, SHIFTING MOTORS TO MAX DISPLACEMENT. FOUR WHEEL DRIVE CANNOT BE ACTIVATED IN TRAVEL MODE.	3. ALL DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED	DATE			
4. THIS WILL PROVIDE MAX TORQUE TO OBTAIN GRADE.	4. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED	APPROVALS			
		CHECKED	AAT	12/05/07	
		DATE			
		DESCRIPTION	SCHEMATIC, HYD SYS, LB030 TIER 3, CSHF		
		PART NO.	988893		
		REV.	D		
		PART WT. LBS			
		SHEET	4 OF 5		



- 1 - SPREADROLL**
- 2 - LH CONVEYOR**
- 3 - RH CONVEYOR**
- 4 - HITCH DOWN**
- 5 - GATE OPEN**
- 6 - WING UP**
- 7 - HITCH UP**
- 8 - GATE CLOSE**
- 9 - WING DOWN**
- 10 - HITCH RELEASE**

NOTES		UNLESS OTHERWISE SPECIFIED		A		12/05/07		2776		NEW RELEASE	
		DIMENSIONS ARE IN INCHES AND APPLY TO FINISHED PART		REV. / APPROVALS		DATE		DATE		ECH	
		ROUGH CUTS MUST INCLUDE APPROPRIATE FINISH ALLOWANCE FOR MACHINED PARTS		DRAWN		AT		12/05/07		DESCRIPTION: SCHEMATIC, HYD SYS, TIER 3, CSHF	
		TOLERANCES ARE FRACTIONAL		CHECKED		AAT		12/05/07		PART NO. 988893	
		DECIMALS OR DECIMALS ANGLES		N.T.S.		INFORMATION CONTAINED ON THIS DRAWING IS THE SOLE PROPERTY OF VEEBOY, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF VEEBOY, INC. IS PROHIBITED.		PART WT. LBS		REV. D	
		VT LEEBOY, INC. 500 LINCOLN COUNTY PARKWAY EXT LINCOLN, NC 28092								SHEET 5 OF 5	

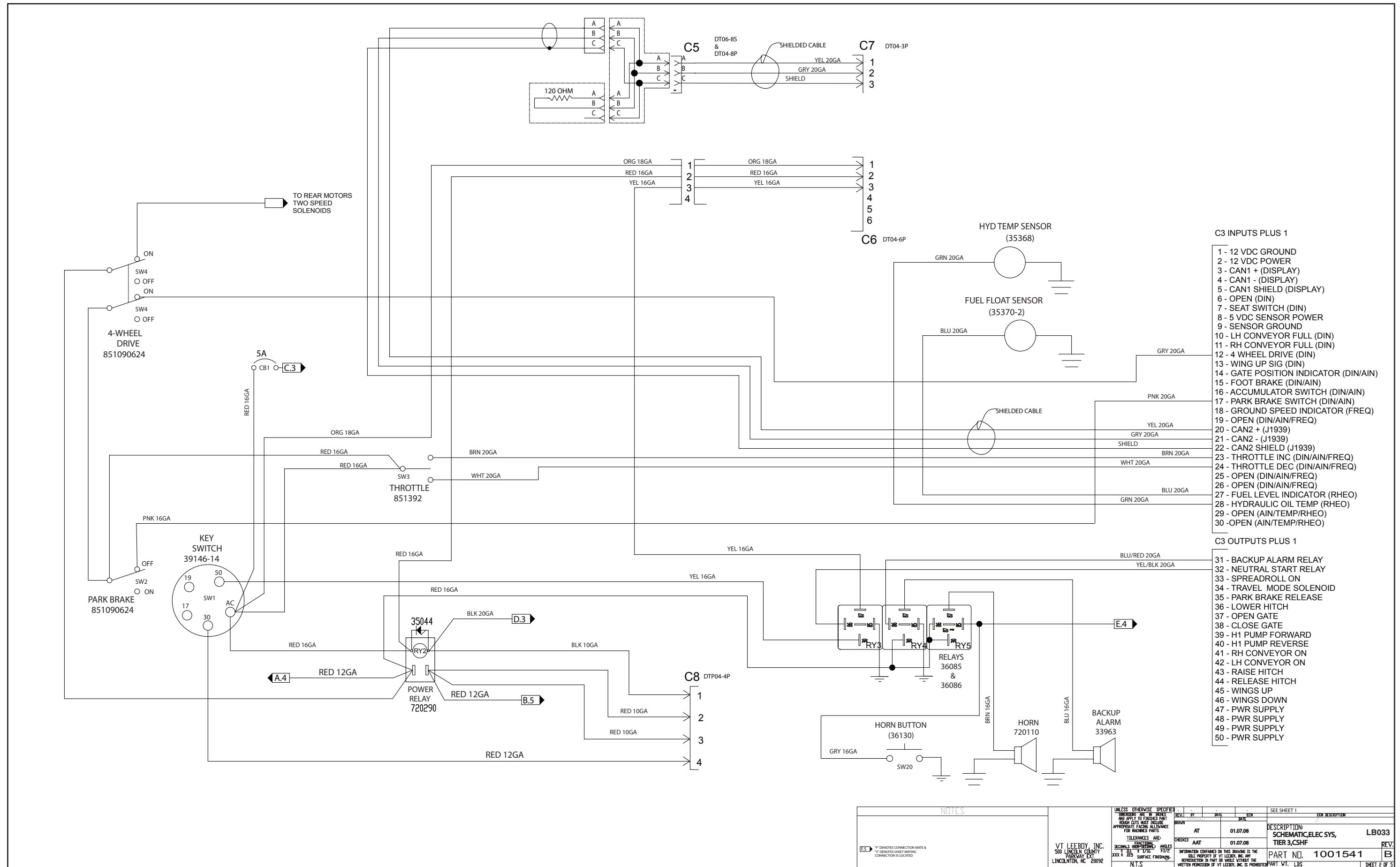


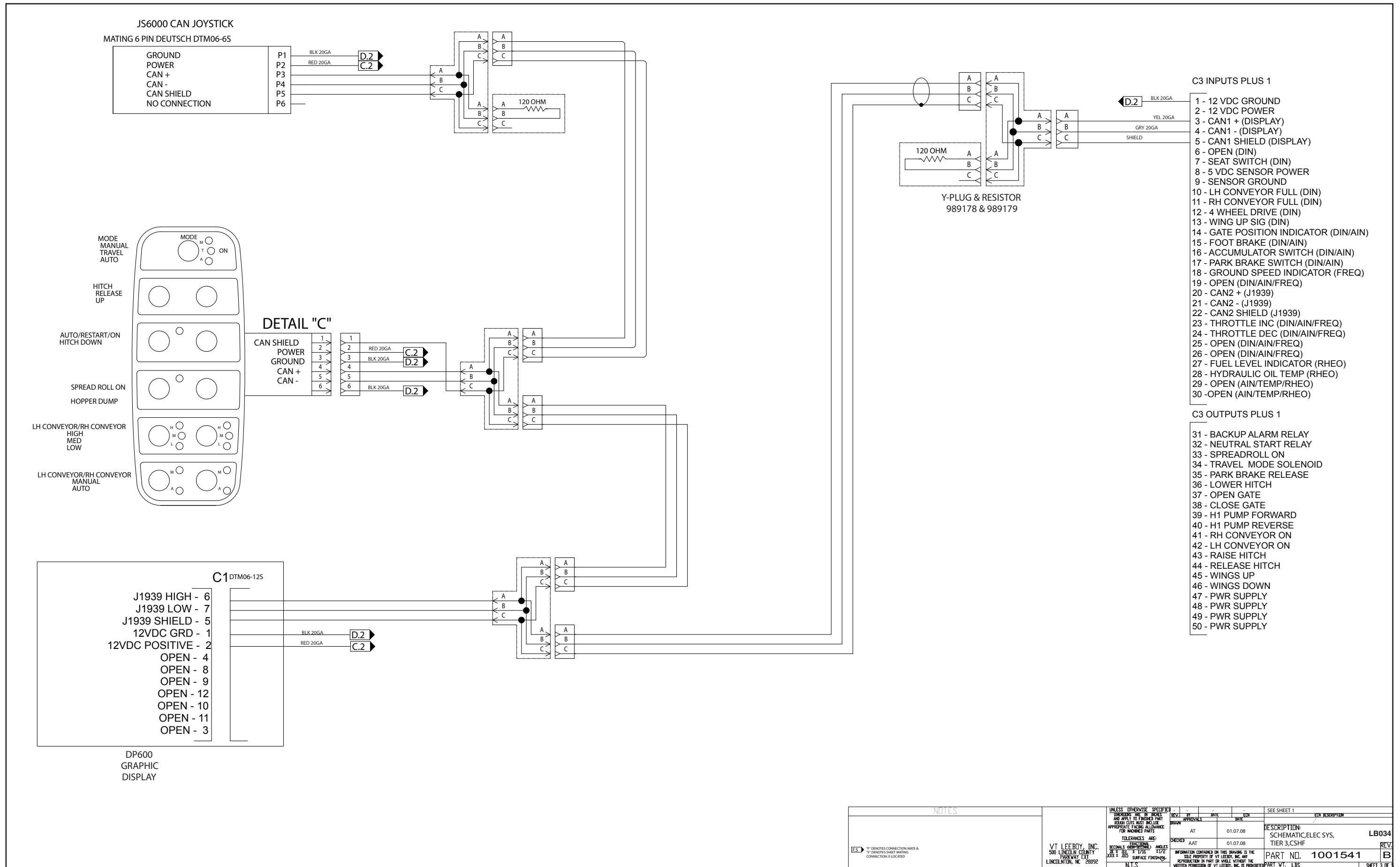
- SW 1 - IGNITION
- SW 2 - PARK BRAKE
- SW 3 - THROTTLE
- SW 4 - 4-WHEEL DRIVE
- SW 5 - LOW ACCUMULATOR PRESSURE
- SW 6 - LOW SERVICE BRAKE PRESSURE
- SW 7 - LH WING UP
- SW 8 - RH WING UP
- SW 9 - RH HOPPER FLOAT
- SW 10 - LH HOPPER FLOAT
- SW 11 - SEAT INTERLOCK
- SW 12 - BEACON ON/OFF
- SW 13 - HAZARD LIGHTS
- SW 14 - TURN SIGNALS
- SW 15 - LIGHTS
- SW 16 - REMOTE LH CONVEYOR
- SW 17 - REMOTE RH CONVEYOR
- SW 18 - REMOTE HITCH RELEASE
- SW 19 - REMOTE HITCH UP/DOWN
- SW 20 - HORN

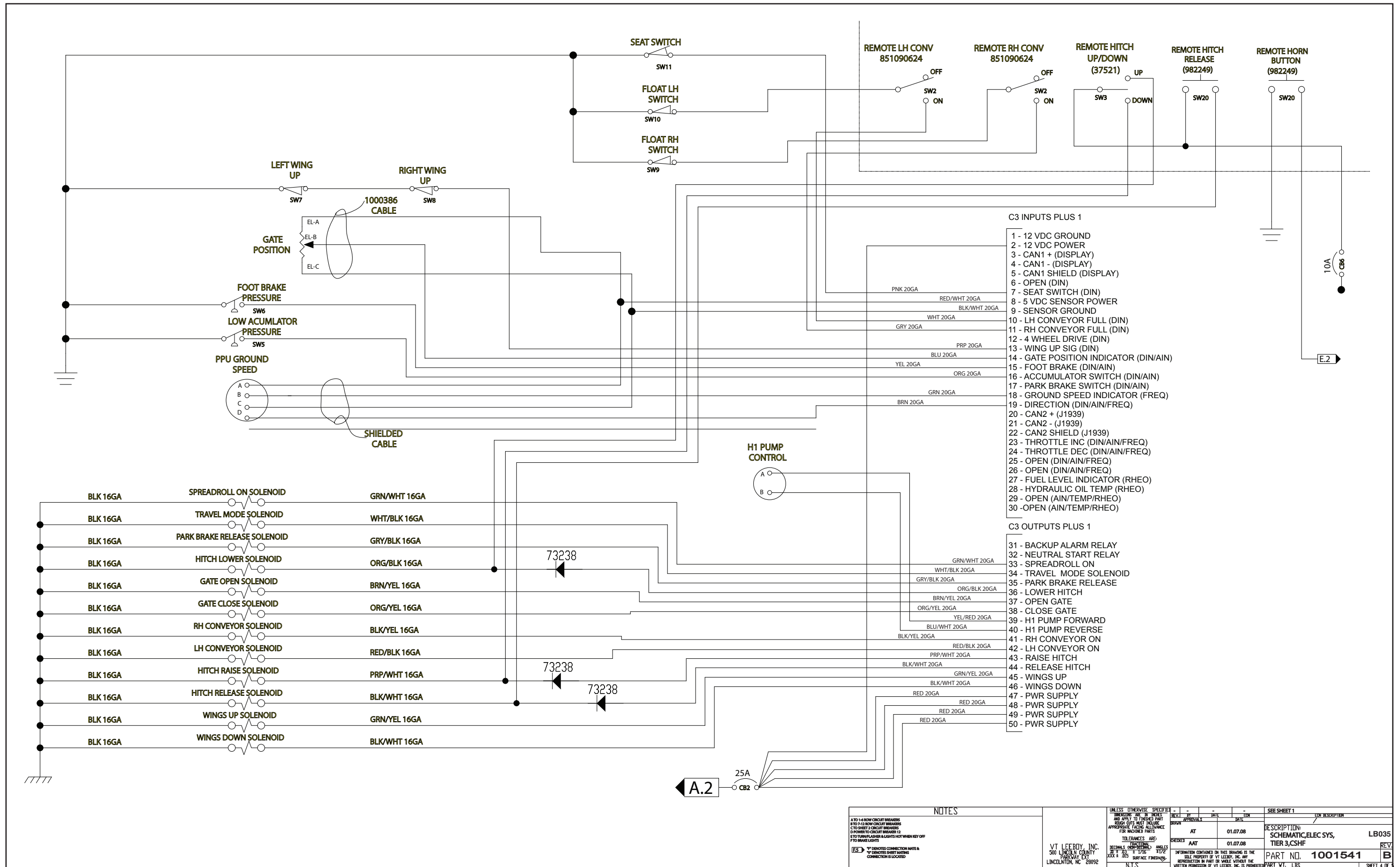
- RY 1 - STARTER RELAY
- RY 2 - POWER RELAY
- RY 3 - STARTER INTERLOCK
- RY 4 - BACK-UP ALARM
- RY 5 - HORN

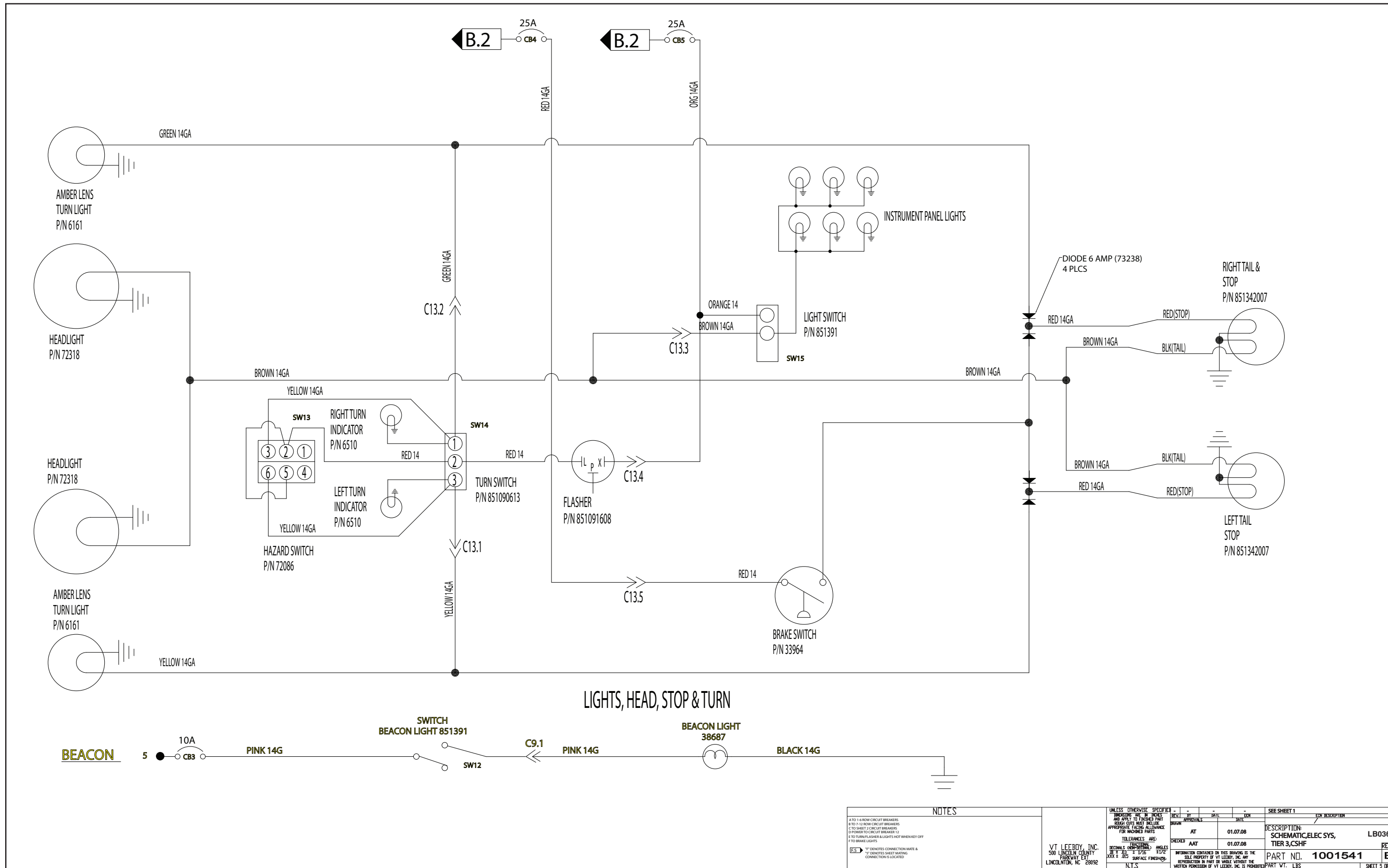
- CB 1 - 5 AMP DISPLAY POWER
- CB 2 - 20 AMP CPU POWER
- CB 3 - 10 AMP BEACON
- CB 4 - 20 AMP BRAKE LIGHTS
- CB 5 - 20 AMP LIGHTS/TURN SIGNAL
- CB 6 - 10 AMP REMOTE SWITCH POWER

NOTES		UNLESS OTHERWISE SPECIFIED		REVISIONS		ADDED REMOTE CONNECTIONS	
DIMENSIONS ARE IN INCHES AND APPLY TO DIMENSIONED PARTS UNLESS OTHERWISE SPECIFIED		REV.	BY	DATE	DATE	DESCRIPTION	FORM DESCRIPTION
TOLERANCES ARE: DECIMALS OVER/UNDER ANGLES		AT	AT	01.07.08		SCHEMATIC, ELEC SYS, TIER 3, CSHF	LB032
REVISIONS OVER/UNDER ANGLES		AT	AT	01.07.08			
REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF V.T. LEEBOY, INC. IS PROHIBITED		PART NO.		1001541		REV. B	
		PART WT.		LBS		SHEET 1 OF 5	

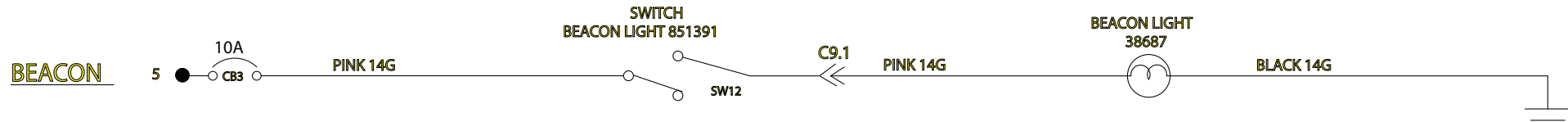








LIGHTS, HEAD, STOP & TURN



NOTES		UNLESS OTHERWISE SPECIFIED		REVISIONS		SEE SHEET 1			
A TO 1/4 ROW CIRCUIT BREAKERS B TO 7-1/2 ROW CIRCUIT BREAKERS C TO SHEET 2 CIRCUIT BREAKERS D POWER TO CIRCUIT BREAKER 12 E TO TURN FLASHER & LIGHTS NOT WHEN KEY OFF F TO BRAKE LIGHTS * DENOTES CONNECTION MATES & ** DENOTES SHEET MATING CONNECTION IS LOCATED		DIMENSIONS ARE IN INCHES AND APPLY TO FINISHED PARTS DIMENSIONS MUST INCLUDE APPROPRIATE FACING ALLOWANCE FOR MACHINED PARTS TOLERANCES ARE:		REV.	DATE	BY	DATE		
		DECIMALS: 0.005 0.010 0.015 0.020 0.030 0.040 0.050 0.060 0.070 0.080 0.090 0.100 0.125 0.150 0.175 0.200 0.250 0.300 0.375 0.450 0.500 0.625 0.750 0.875 1.000 1.250 1.500 2.000 2.500 3.000 4.000 5.000 6.000 8.000 10.000 ANGLES: 30° 45° 60° 90° 120° 135° 150° 180° SURFACE FINISH: N.T.S.		AT	01.07.08			DESCRIPTION: SCHEMATIC, ELEC SYS, TIER 3, CSHF	LB036
				CREATED	01.07.08			PART NO. 1001541	REV. B
				INFORMATION CONTAINED ON THIS DRAWING IS THE SOLE PROPERTY OF VTI LEEBOY, INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF VTI LEEBOY, INC. IS PROHIBITED.				PART WT. LBS	SHEET 5 OF 5