This manual must be kept on the machine at all times.

BROUWER
EQUIPMENT BUILT FROM EXPERIENCE

BROUWER

4000-R

Self Propelled Sod Harvester

Operator's Manual

BROUWER kesmac
EQUIPMENT BUILT FROM EXPERIENCE

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April 2019

BROUWER*4000-16/24R*
Sod Harvester

Operator's Manual

Contents.

BROUWER-*16/24R*

Self Propelled Sod Harvester

Foreword

IMPORTANT

The Owner and Operator, must assume responsibility for the safe operation of the machine, their own safety, and the safety of others, by reading, understanding, and following all of the safety instructions and operating procedures as outlined in the machines Operator's Manual.
Failure of the Owner or Operator to adhere to the recommended safety instructions and operating procedures, indemnifies Brouwer Turf Inc. against any claims that may arise, due to accidents resulting in personal injury or property damage.

It is not possible to list all situations that may affect the safety of the machine or the operator, and therefore Brouwer Turf Inc. cannot list all precautions, and identify all potential hazards, that may prevent accidents.

IF YOU DO NOT UNDERSTAND….ASK

BE A QUALIFIED OPERATOR BY ;

- Reading and obeying the instructions in this manual, and the safety decals on the machine.
- Receiving operational training on the sod harvester.
- Asking your supervisor or equipment dealer to explain anything you do not understand.
- Explaining the written instructions in the operator's manual and safety decals to user/operators who cannot read or understand them.

WARNING

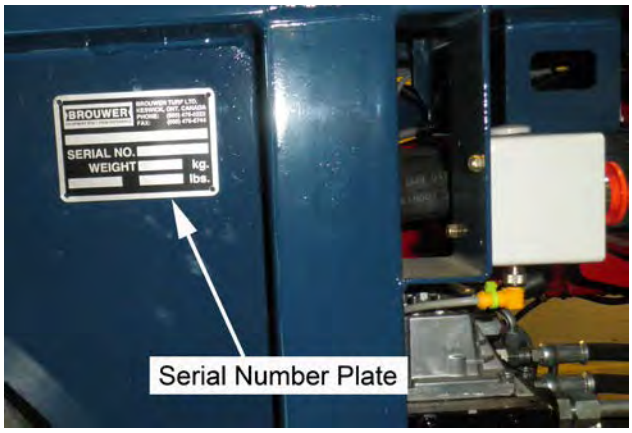
Brouwer Sod Harvesters are designed for safe efficient operation and must not be used for any purpose other than that for which they are designed.
Prior to being shipped from the manufacturer the machines are inspected to insure that all safety guards, shields and warning/safety/operating decals are correctly positioned and secure
Before operating the machine the operator must check that all of the above items are correctly located.
The machine must not be used if any guards, shields or warning/operating decals are damaged or missing.

Brouwer Sod Harvesters are designed and built to give many years of outstanding performance.
The service and reliability you receive from this product will be affected by the proper maintenance and operation of the machine.
Use only genuine factory placement parts. Parts not supplied by Brouwer may not meet the factory engineering specifications or standards of manufacture and may void warranty. The use of non-approved parts may result in component failure causing damage to the machine and possibly result in an accident to the operator or others.

IMPORTANT

MODEL NUMBER
The Model Number appears on sales literature technical manuals and price lists.

SERIAL NUMBER
The serial number applies only to the machine to which it is allocated.
The serial number **MUST** be quoted when ordering parts or calling for service or warranty



IMPORTANT

This machine is covered by one or more of the following patents:

U. S. Patents

3,590,927	4,345,659	5,775,436
3,790,096	4,621,696	6,056,064
4,015,566	4,832,130	
4,018,287	4,944,352	
4,029,152	4,903,778	

Other patents pending.
Also patented in other countries.

THIS MACHINE CANNOT BE COPIED IN WHOLE OR IN PART FOR OWN USE OR RESALE.

BROUWER
EQUIPMENT BUILT FROM EXPERIENCE

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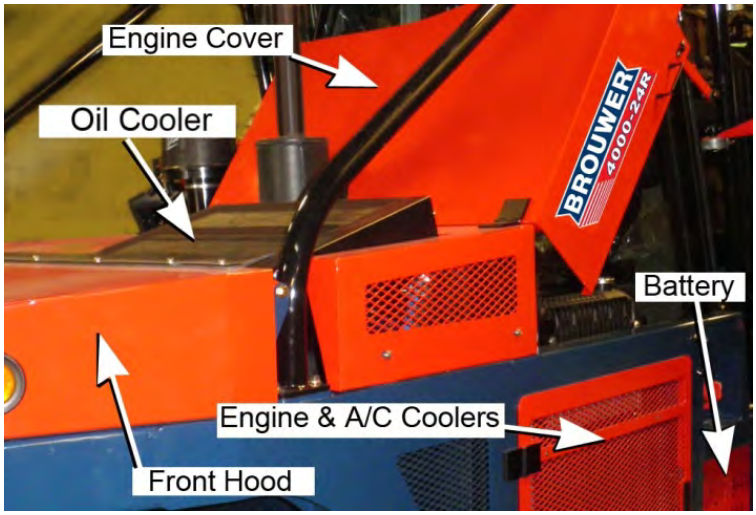
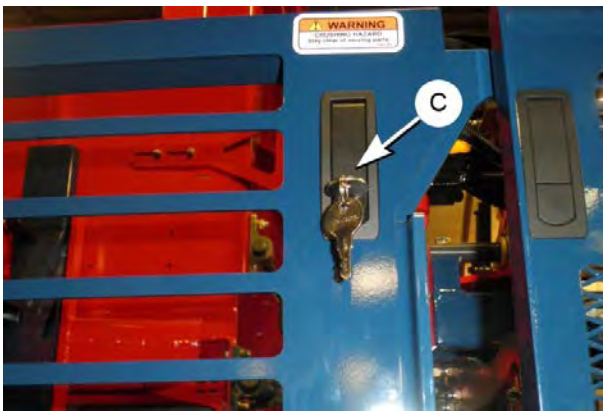


Maintenance and Service Access.



Keyed Locks are fitted to the Safety Guards : Gripper Head ‘A’; Roll-Up Area ‘B’; and Index Conveyor ‘C’. These keys must be kept with the ignition key at all times.

Under no circumstance should the keys be left in the locks.

WARNING

Do not operate the machine if any of the safety guards are damaged or missing. In this manual for illustration purposes only, some guards may not be shown.

4000 Harvester Specifications.

Conveyor	Rubber Mat
Cutting Head	Full Floating Cutter Head
Width of Cut	16in.(406mm) /23in.(584mm) /24in.(610mm).
Length of Cut	up to 100 in.(2540mm).
Thickness of Cut	Hydraulically Adjustable
Standard Pallet Size	48in.(1219mm).
Cutter Drive	Variable Hydraulic
Conveyor Drive	Variable Hydraulic
Cutting Blades	Standard with Fingers / V-Blade
Construction	High Strength Steel Weldment
Total Weight	16in.-18641lbs.(8455kg). 24in.-20900lbs.(9480kg)
Overall Length	296in,(7518mm).-Less Ski.
Overall Width	124in.(3150mm)-Less Toe Guard.
Shipping Width	91in.(2312mm). Machine is taken apart for container.
Overall Height	104in.(2642mm).-Less Strobe.(112.5in.w/mast sensor).
Pallet Configuration	Pyramid or Flat Top Upper Level Squeeze Function
Flap Control	Automatic

Tire Specifications

Front Tires . 550/45 R22.5 Flotation (Optional 380/75 R20)
Rear Tires .. 650/55 R22.5 Flotation Radial

Cab

Cab ..... Deluxe Cab
Seat..... Adjustable Suspension Swivel Seat

NOTE

Refer to Section 9 for the engine operating/maintenance manual.
Refer to the following page for your nearest Caterpillar Dealer/Service location.

Due to constant program of product development, specifications may change without notice or obligation.

Customer Service

i02097871

Customer Assistance

SMCS Code: 1000

USA and Canada

When a problem arises concerning the operation of an engine or concerning the service of an engine, the problem will normally be managed by the dealer in your area.

Your satisfaction is a primary concern to Caterpillar and to Caterpillar dealers. If you have a problem that has not been handled to your complete satisfaction, follow these steps:

1. Discuss your problem with a manager from the dealership.
2. If your problem cannot be resolved at the dealer level without additional assistance, use the phone number that is listed below to talk with a Field Service Coordinator:

   1-800-447-4986

   The normal hours are from 8:00 to 4:30 Monday through Friday Central Standard Time.
3. If your needs have not been met still, submit the matter in writing to the following address:

   Caterpillar Inc.
   Manager, Customer Service, Engine Division
   Mossville Bldg AC
   P.O. Box 610
   Mossville, Illinois 61552-0610

   Please keep in mind: probably, your problem will ultimately be solved at the dealership, using the dealership's facilities, equipment, and personnel. Therefore, follow the steps in sequence when a problem is experienced.

Outside of the USA and of Canada

If a problem arises outside the USA and outside Canada, and if the problem cannot be resolved at the dealer level, consult the appropriate Caterpillar office.

Latin America, Mexico, Carribean
Caterpillar Americas Co.
701 Waterford Way, Suite 200
Miami, FL 33126-4670
USA
Phone: 305-476-6800
Fax: 305-476-6801

Europe, Africa, and Middle East
Caterpillar Overseas S.A.
76 Route de Frontenex
P.O. Box 6000
CH-1211 Geneva 6
Switzerland
Phone: 22-849-4444
Fax: 22-849-4544

Far East
Caterpillar Asia Pte. Ltd.
7 Tractor Road
Jurong, Singapore 627968
Republic of Singapore
Phone: 65-662-8333
Fax: 65-662-8302

China
Caterpillar China Ltd.
37/F., The Lee Gardens
33 Hysan Avenue
Causeway Bay
G.P.O. Box 3069
Hong Kong
Phone: 852-2848-0333
Fax: 852-2848-0440

Japan
Shin Caterpillar Mitsubishi Ltd.
SBS Tower
10-1, Yoga 4-Chome
Setagaya-Ku, Tokyo 158-8530
Japan
Phone: 81-3-5717-1150
Fax: 81-3-5717-1177

Japan
Caterpillar Power Systems, Inc.
SBS Tower (14th floor)
4-10-1, Yoga
Setagaya-Ku, Tokyo 158-0097
Phone: 81-3-5797-4300
Fax: 81-3-5797-4359

Australia and New Zealand
Caterpillar of Australia Ltd.
1 Caterpillar Drive
Private Mail Bag 4
Tullamarine, Victoria 3043
Australia
Phone: 03-9953-9333
Fax: 03-9335-3366

SECTION 1

WARNING

Unauthorized modifications may result in **extreme safety hazards** to operators and bystanders, and could result in damage to the machine.

Brouwer Turf Inc. warns against and strongly rejects and disclaims against any modifications, add-on accessories or product modifications that are not designed, developed, tested and approved by Brouwer Engineering Department.

Any Brouwer product that is altered or modified in anyway that is not authorized, after original manufacture, including after market accessories or component parts that are not approved by Brouwer Turf Ltd. will result in the machines warranty being voided.

All liability for personal injury and/or property damage caused by any unauthorized modifications, add-on accessories or products not approved by Brouwer Ltd. will be considered the responsibility of the individual(s) or Company designing and/or making such changes.

Brouwer Turf Inc. will vigorously pursue full indemnification and costs, from any party responsible for unauthorized post manufacture modifications and/or accessories, should personal injury and/or property damage result from any of the above.

DANGER

TO PREVENT POSSIBLE SERIOUS INJURY OR DEATH :
Under no circumstances is any service or maint-enance work to be performed on the machine until :

- **THE ENGINE IS SWITCHED OFF.**
- **THE IGNITION KEY IS REMOVED.**
- **THE CAB DOOR IS LOCKED.**

Brouwer Turf Inc. cannot stress too strongly the importance of Owners/Operators adhering strictly to the safety recommendations as stated in this manual.

WARNING

For illustration purposes only some safety guards and shields may not be shown.
The machine must not be operated if any guards or shields are damaged or missing.
Failure to observe this warning could result in serious injury or death.

This Symbol means :

- **ATTENTION !**
- **BECOME ALERT !**

Your safety and that of others is involved.

Signal word definitions.

The signal words below are used to identify levels of 'hazard' seriousness. These words appear in this manual and on the safety decals that are placed on the machine.
For your safety and that of others, read and follow the information and instructions given with these signal words and/or the symbol shown above.

DANGER:
Indicates an imminently hazardous situation which if not avoided **WILL** result in death or serious injury.

WARNING:
Indicates a potentially hazardous situation which if not avoided **COULD** result in death or serious injury.

CAUTION:
Indicates a potentially hazardous situation which if not avoided **MAY** result in minor or moderate injury.
It may also be used to alert against unsafe practices or property damage.

CAUTION:
Used without the safety alert symbol indicates a potentially hazardous situation which if not avoided **MAY** result in property damage.

Safe Operation

Operator preparation and training.

Read the ***Brouwer400024-R/400016-R*** Operator's Manual. It must be kept on the machine at all times.

- If an operator or mechanic cannot read and understand English, it is the owners responsibility to explain the material contents to them.
- If any of the information or instructions in this manual are not clear, contact your dealer or the factory representative for clarification.
- Become familiar with the safe operation of the machine, the operating controls and the safety decals. If there are any questions concerning safety, do not operate the machine until they are clarified.
  All safety guards and shields must be kept in place and in good condition. All interlock switches must be correctly adjusted.
- It is the owners responsibility to ensure that all operators and service personnel are trained in the proper operation and service procedures of the machine.
- Do not allow children or untrained persons to operate this equipment. Local regulations may restrict the age of the operator.
- Wear appropriate work clothing, safety equipment and work boots. Do not operate the machine with loose clothing, long hair, or any jewelry, that may get tangled in moving parts.

CAUTION

Wear suitable hearing protection such as earmuffs or earplugs, to protect against hearing impairment or hearing loss.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating the machine.

- Only the operator must be on the machine, never allow riders on the machine. Riders can be injured by foreign objects or can be thrown off the machine. Also they may obstruct the ability of the operator or the operators view resulting in unsafe operation of the machine.
- warning/safety decals must be kept clean, legible, and undamaged. Do not operate the machine if any decals are missing or damaged. Obtain new decals from the factory.
- Do not operate the machine if drugs, alcohol or medication are being used that can affect the alertness or co-ordination of the operator. Seek professional advice before operating the machine if there is any doubt about the side affects of any medication being taken that may put your safety and that of others at risk.
- Keep animals and bystanders clear of the machine, at a safe distance, when operating the machine.
- The owner/operator is responsible for accidents and/or injuries that may occur to themselves, bystanders, or property that may occur as a result of the operation of this machine.

Machine preparation

- Check that the 'operator presence' interlock switch is operating.

WARNING

If the operator leaves the operator's seat while the machine is moving, the system will automatically move the controls to neutral and the machine will stop.

- Do not tamper with, or defeat, safety devices. Keep guards, shields and interlock safety devices in place and in proper working condition. They are for your protection.
- Check regularly that all fasteners, nuts/ bolts, and retainer pins are secure.
- Check daily that the machine is in good working condition. Check all tires for damage or excessive wear.
- Use only accessories, attachments and replacement parts that are approved by the manufacturer.

WARNING

To prevent unauthorized persons having access to the cab:

The cab door must be kept locked when in service, and the key in possession of the service person.

IF YOU DO NOT UNDERSTAND....*ASK*

General Operating Safety

- Ensure all persons are clear of the machine before starting the engine. Keep hands and feet clear of the cutting unit and all moving parts.
- Do not make sharp turns. Exercise care when reversing and maneuvering. Look behind the machine and downward when reversing.
- Keep all persons clear of the Robotic Arm operating areas and pallet cavity, the Arm may move suddenly and result in serious injury.
- Exercise caution when approaching or crossing roadways.

WARNING

Never attempt to get on or off the machine when it is moving.
Before leaving the operating position, place the Control Handle in 'neutral', set the brake, lower the cutting head and pallet forks to the ground, stop the engine and remove the ignition key.

Starting the Engine.

WARNING

Start only in accordance with the instructions in this manual

- Start only from the operator's seat, with System Power '**OFF**', the Control Handle in '**NEUTRAL'** and brake '**ON**'.
- **DO NOT** use starting-aid fluid.

Transporting

- Exercise caution when loading or unloading the machine on or off a truck or trailer.

IMPORTANT

If the Conveyor is to be removed when transporting the machine refer to page 1-09 for the correct procedure.

- Ensure that the machine is properly 'blocked' and secured during transport.

Operating

- Do not change the engine governor setting, or over-speed the engine.

WARNING

Work in a ventilated area. Never operate the machine without adequate engine exhaust ventilation.
Never run the engine in an enclosed area. Exhaust fumes contain carbon monoxide and can be fatal if inhaled.

- Inspect the area to harvested and remove any objects that may be hazardous or may cause an injury.
- Operate with adequate light and avoid any holes and other hazards.

Highway Operation

- Ensure that the 'Slow moving vehicle' sign is in place.
- To prevent collisions with other vehicles, slow moving tractors with attachments, towed equipment or self-propelled machines, frequently check for traffic from the rear, particularly when making turns. Always use the turn signal lights.
- Slow down and exercise caution when making turns and when crossing roads and railway tracks.
- Use headlights, flashing warning lights and turn signals day and night. Follow local regulations for equipment lighting and marking.
Ensure that all lighting, signals and markings are visible, clean and in good working order.
Repair or replace any lights, signals or marking that is damaged or is missing.

To prevent Tipping

- Avoid holes, ditches, slopes, and obstacles that may cause instability and the machine to tip.

WARNING

Never drive close to the edge of a gully or steep embankment that may collapse and cave-in, causing the machine to tip.

Speed Control. 'HI' –'LOW'.

To change speed from 'HARVEST' (LOW) to 'ROAD' (HI). Stop the machine and operate the 2-Speed switch on the cab Switch Panel. See page 2-01. Reverse the procedure for 'HI' to 'LOW'.

- Reduce travel speed before descending a steep incline, to assist in braking and improving your control of the machine.
- Slow down and exercise caution when making turns and changing direction on a slope.

Stopping Operation

- Before stopping the engine: Reduce the engine speed to **'SLOW'** and let it operate at 'no load' for five to ten minutes, to allow the engine to cool down.

To safely park the machine:

- Stop on level ground. Place all controls in the **'OFF'** position. Lower the Cutter Head and the Forks to the ground. Put the Control Handle in the **NEUTRAL** position. Apply the brake and switch off the engine. Before leaving the operator's seat, wait for the engine and all moving/rotating parts to stop. Remove the ignition key.

To free a 'mired' machine.

- Check that all towing devices are of adequate size/strength to handle the load.
- Always attach to the Draw Bar of the towing unit. Do not use the front attachment point. Apply power smoothly to take up slack, a sudden pull could 'snap' the towing device causing it to 'whip' or 'recoil' dangerously.

CAUTION

The machine must not be towed any further than necessary to extricate it.

Caution should be exercised when attempting to free a machine that is stuck in mud.
Hazards that can occur when towing, and are to be avoided are:

- The towing tractor overturning.
- The tow chain failing and recoiling. (Use of a cable is not recommended).
- Tow-bar failing.
- The harvester becoming unstable and tipping.

The following procedures are recommended;

- If possible reverse the machine out, if it is 'mired' in mud.
  Dig mud out from behind the wheels. Place boards behind/under the wheels and reverse out **'slowly'. Keep bystanders clear of the rear of the machine.**
- Dig mud out from in front of the wheels and drive ahead **'slowly'**.

Maintenance Safety

WARNING

Do not service or repair this machine with the attachments in the raised position, unless they are securely blocked, or the safety devices are engaged.
Do not enter the Forks/Piling Cavity area when the engine is running
Failure to follow these warnings could result in serious injury or death

- To attain maximum safety and the optimum harvesting results, maintain your Harvester according to the recommended schedules and instructions in this manual.
- When servicing or operating the machine do not wear loose clothing or jewelry that can entangle in machinery and cause personal injury.
- Never allow untrained persons to operate or service the machine.
- Allow the engine and rotating/moving parts to come to a complete stop before attempting any service or repair work.
- Turn the battery Isolator Switch 'OFF' before making any repairs, and before doing any welding on the machine.
- Carefully release pressure from components with 'stored' energy.
- Park the machine on smooth, firm, level ground.
- Replace worn, damaged, or faulty parts only with ones supplied by the manufacturer.
- Before working on the machine, lower the Cutter Head and the Forks to the ground and lower the Gripper Head onto sod rolls on the Index Conveyor.
  If the machine is to be raised, use jack stands. If left in a raised position hydraulic supports can settle or 'leak' down.

Maintenance Safety

WARNING

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load.
Do not work under a machine that is supported solely by a hydraulic jack.

- To reduce fire hazards: Keep the engine, muffler, battery area and fuel storage area free of grass, leaves, debris or grease build-up.
- Clean-up any fuel or oil spillage.

Handling Fuel.

WARNING

- Exercise caution when refueling do not over-fill. Fuels are flammable and vapors are explosive. If using fuel cans use only approved containers and a funnel. Avoid spillage. Clean-up spills immediately.
- Do not smoke, allow naked flame, or cause sparks near the fuel.
  Never drain or fill the fuel tank indoors.
- Never remove the Fuel Tank Cap or add fuel when the engine is running or if it is hot.
- Never handle or store fuel containers near an open flame or any device that may create sparks and ignite the fuel or vapors.
- Ensure that the Closure Caps on the Fuel Tank, and any containers, are replaced securely.

WARNING

To prevent sparks from static discharge:

- Do not fill containers in a vehicle, on a truck, or a trailer bed that has a plastic liner. Fill the containers on the ground, away from the vehicle.

- Always keep the fuel dispenser nozzle in contact with the rim of the fuel tank, or container opening, until fueling is completed.
- Do not use a nozzle lock-open device.
- Always be prepared in case of fire. Keep a first-aid kit and fire extinguisher close to hand.
- Keep emergency numbers for fire, hospital, ambulance services, and doctors close to your telephone.

Refer to page 1-08 for fuel filler and fuel gauge locations.

Hydraulic System

WARNING

The Hydraulic System operates under high pressure.

To prevent serious injury from hot, high pressure oil:

- Never check for leaks with bare hands. Use cardboard, paper or wood.
- High pressure oil can penetrate the skin. If it is injected into the skin it must be surgically removed within a few hours, by a doctor familiar with this type of injury. Failure to do so may result in gangrene.

- Relieve high pressure before disconnecting hydraulic lines or fittings.
- Fully tighten fittings and connections before pressurizing the system.
- Before inspecting or disconnecting hydraulic lines or fittings. Lower Cutter Head and the Forks to the ground. Disengage all drives, apply the brake/inch/clutch pedal. Stop the engine and remove the ignition key,
- Visually check daily all hydraulic hoses, tubes and fittings for leaks. Replace any worn or damaged hoses, tubes or fittings before operating the machine.
- Replacement hoses or tubes must be routed in the same location and path. Do not move clamps, brackets or ties to new locations.
- Thoroughly inspect all hoses, tubes and fittings every 300 hours.

IMPORTANT

To prevent serious damage to the hydraulic system components, do not allow any contaminants to enter the hydraulic system. Clean thoroughly around all fittings and areas to be worked on. Cap and plug any connections that are disconnected.

- Before disconnecting, tag or mark the location of the connection.
- Check that ‘O-Rings’ are clean and hose fittings are properly seated before tightening.
- Align the hoses without twisting. Twisted hoses can cause couplings to loosen as the hose flexes during operation resulting in oil leaks.
- Kinked or twisted hoses can restrict the oil flow causing the oil to overheat, the system to malfunction, possible hose failure,

Cooling System

WARNING

To prevent serious injury from hot coolant and steam, **DO NOT** remove the radiator cap when the engine is running and/or hot. Allow the engine and system to cool. Use caution when removing the radiator cap.

- Do not operate the engine without the recommended coolant mixture.
- Add top-up coolant into the recovery tank **NOT** directly to the radiator
- Ensure that the radiator cap is tight and secure.
- If the radiator cap must be removed, stop the engine and allow the cooling system to cool, until the cap is cool to the touch. Loosen it slowly to relieve pressure, before removing completely.

Battery Service

WARNING

The sulfuric acid in the battery electrolyte is poisonous. It can cause serious skin burns and blindness if splashed in the eyes.

CAUTION

Always wear protective glasses/goggles, and protective clothing and use insulated tools when working with batteries.
Read, understand, and obey the battery manufacturers instructions and warnings.
Battery posts, terminals and related accessories contain lead, lead compounds and chemicals. Wash your hands after handling them.

Avoid Hazards By:

- Fill/top-up batteries in a well ventilated area.
- Wearing eye protection and rubber gloves.
- Avoid breathing fumes.
- Avoid spilling, splashing or dripping electrolyte.
- Follow proper 'jump-start' procedure.

If acid is splashed on your person:

- Flush the affected skin with water.
- Apply baking soda, or lime, to help neutralize the acid.
- Flush your eyes with water for 15 to 30 minutes. Get medical help immediately.

If acid is swallowed:

- Do not induce vomiting
- Drink large quantities of water or milk, but do not exceed 2 liters (2 Quarts).
- Get medical help immediately.

Battery Charging

- Charge batteries in an open well ventilated area, away from sparks or open flame.
- Unplug the charger before connecting or disconnecting the battery.

Jump Starting

- Check that the Jumper cables are in good condition.
- Turn the ignition and all electrical accessories 'OFF', on both machines.
- Position the machine with the 'charged' battery close to, but not touching, the machine with the dead battery, to ensure that the cables will easily reach.

Connecting the Cables

- Do not allow the cable clamps to touch any metal parts except those intended.
- Never connect the **positive '+'** (red) terminal to the **negative '-'** (black) terminal.
- Ensure that the cables cannot get caught in moving engine parts when starting.
- Connect one end of the **positive '+'** (red) cable to the **positive '+'** terminal on one battery. Connect the other end to the **positive '+'** terminal on the other battery
- Connect one end of the negative **'-'** (black) cable to the negative **'-'** terminal on the 'charged' battery. Connect the other end of the cable **to the engine block** on the machine with the 'dead' battery.
- Start the machine that has the 'charged' battery, then start the machine that has the 'dead' battery.
- Remove the jumper cables in the exact reverse order of connecting. Do not allow the cable clamps to touch any metal parts while the other end is connected to a battery terminal.

IMPORTANT

Keep the battery terminals clean. Smear them with white grease to prevent corrosion.
The positive terminal (red) protective cover must be kept in place.

Transporting and Storage

IMPORTANT

If the machine should become disabled, and cannot be moved under its own power, refer to page 1-09 for the recommended procedure for towing and transporting.

Storage

IMPORTANT

If the Harvester is to be stored 'inside' keep the doors open to ensure good ventilation until the procedure below is complete.

- Stop the engine and allow it to fully cool down.
- Evacuate the fuel from the tank into an approved container and shut off the fuel.
- Store the fuel in a cool dry location.
- Turn the Battery Isolator Switch to '**OFF**'.
- Keep the Harvester and fuel containers in a locked, secure storage place, to prevent tampering, and children from playing in the area.
- Do not store the Harvester or fuel containers close to heating appliances with an open flame, such as a water heater with a pilot light.

Safe Service Procedures

CAUTION

Do not service the harvester when it is moving or the engine is running. Failure to follow this warning could result in minor injury as moving parts can crush.

.

- If servicing a four wheel drive machine, when necessary raise **front and rear wheels** off the ground. This is to prevent the machine being pulled of the jack stands if power is applied to the wheels.
- Tighten the wheel lug nuts to the correct torque as specified in specifications section, page 6-13.
- Refit all safety guards and shields that may have been removed during service.

Tire Service

WARNING

Do not operate the harvester if any of the tires are badly worn or damaged. See Page 6-13 for tire pressures

The front tires are loaded with liquid ballast, and are **extremely heavy. Exercise caution when removing or replacing them.** Use suitable tools, equipment and hoists with adequate lift capacity. **Only qualified and experienced personnel must service the wheel assemblies.**

CAUTION

Operating the machine with loose wheel lug nuts will result in damage to, and require the replacement of, wheel assembly components.

- Always maintain the correct tire pressures.
- **Do not** inflate tires above the recommended operating pressure shown on the side wall.

DANGER

Never weld or heat a wheel/tire assembly. The heat can cause increased air pressure and result in the tire exploding. Explosive separation of tire and rim components will result in serious injury or death

- When inflating tires use a clip-on chuck, and a air hose that is long enough to allow you to stand to one side of the wheel, not in front or over it. Use a safety cage if one is available.

Handling Chemical Products

CAUTION

To prevent serious personal injury avoid direct exposure to hazardous chemicals. Potential hazardous chemicals include: fuels, lubricants, coolants, paints and adhesives.

Material Safety Data Sheets (MSDS)

Material Safety Data Sheets provide specific details on chemical products that affect:

- Physical and personal health hazards.
- Safety procedures.
- Emergency response techniques

It is recommended that the MSDS data is checked before a job is started that involves a hazardous chemical. This informs of the possible risks and the safest way to proceed. Follow carefully the recommendations.

Proper Waste Disposal

- Improper disposal of waste material is harmful to the environment. Some potentially harmful products used on machines are: oil, fuel, filters coolant, brake fluid, and batteries.
- Use leak proof containers when draining fluids. Do not use food or beverage containers that someone may mistakenly drink from.
- Do not pour waste fluids onto the ground, down a drain or into any natural water source.
- Air conditioning refrigerants are harmful to the atmosphere. Government regulations may require a certified technician to service and properly recover and recycle refrigerants.

- Before disposing of waste material, enquire at your local environmental or recycling facility for instructions on proper waste disposal.

Welding on Painted Areas

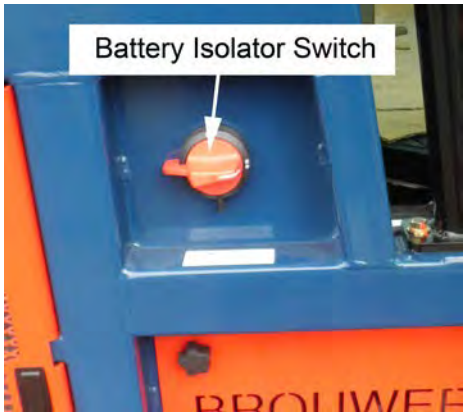
CAUTION

Hazardous fumes are generated when paint is heated when welding, soldering, or using a torch. The use of an approved respirator is recommended when welding, sanding or grinding on painted areas to avoid the inhalation of fumes or dust.

- It is recommended that paint be removed a minimum of 4 inches (100mm) from around the area to be affected by heating.
- If solvent or stripper is used, wash them off with soapy water before doing any welding. Remove any stripper or solvent containers and other flammable material from the area. Allow a minimum of 15 minutes for fumes to disperse before welding.
- Do not use chlorinated solvent in areas where welding will be done. Do all work in an area that is well ventilated to allow fumes and/or dust to disperse.

CAUTION

Do not weld, solder or use a torch close to pressurized fluid lines, that may cause them to burst. Flammable spray can be generated by burst fluid lines resulting in severe burn injury to yourself and bystanders.

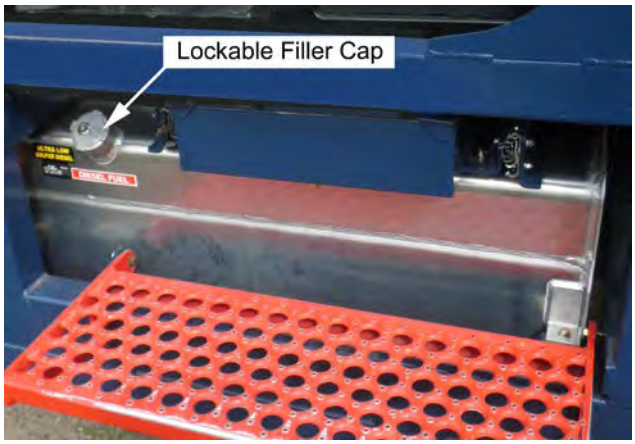


CAUTION

To prevent damage to the Electronic Controllers :
Do not do any welding on the machine until the Battery Isolator Switch is turned 'OFF'

Fuel Tank and Fuel Gauge.

Fuel Tank.

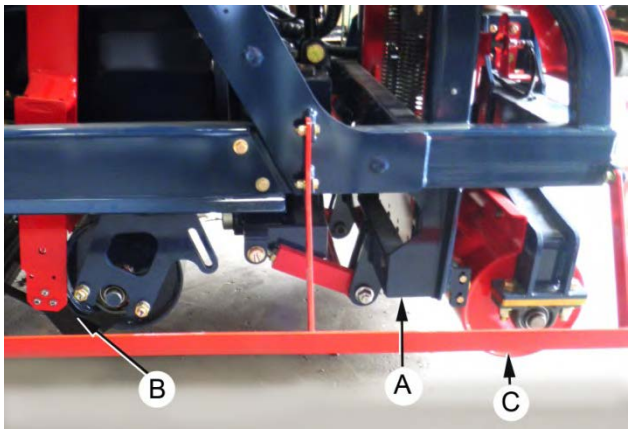


Fuel Gauge.

To move the machine with no engine power:

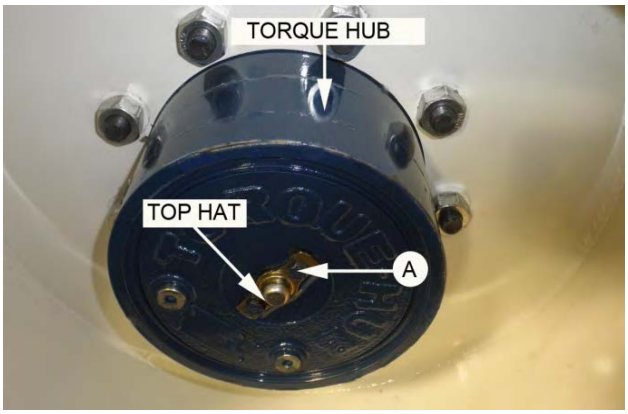
If **the engine cannot be started, and it is necessary that the machine has to be moved, follow the procedure below.**

- Jack-up the conveyor frame at '**A**', sufficient to allow the cutter blades '**B**' to be removed.
- To prevent the conveyor frame from dropping while removing the cutter blades, place a suitable support under the front ground roller '**C**'.
- Remove the cutter blades '**B**'.
- Remove the roller support and lower the conveyor to place the Front Roller '**C**' on the ground.



Release the Torque Hub Brakes *on all wheels*:

- Remove the Bolts '**A**' securing the 'Top Hat' Plate.
- Reverse the 'Top Hat' Plate and replace the bolts.



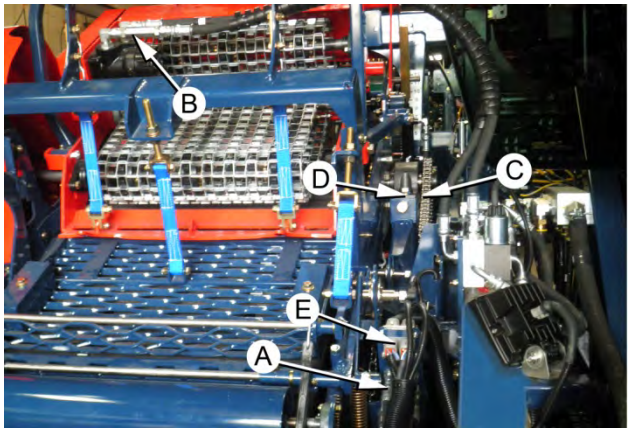
WARNING

The machine can now be towed to another location.
Extreme caution must be exercised. It will ***not be possible to steer or apply brakes during*** this operation.
Do not move the machine onto an incline as it may 'run-away'.

If the problem with the engine is investigated and not resolved then a call to your Caterpillar Engine service representative is necessary.

If the problem cannot be resolved 'on site' and is such that the engine has to be repaired at a Caterpillar Service Center, it is recommended that the main conveyor is removed from the machine to enable easier transportation.

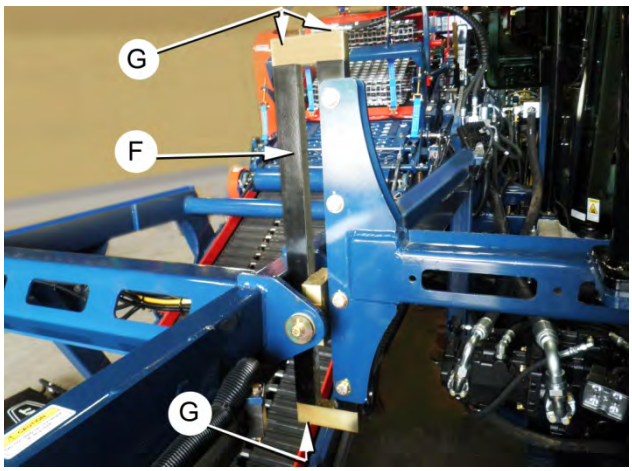
To remove the Main Conveyor:
Position a fork lift under the rear end of the conveyor frame, or use slings, to support it when it is disconnected from the main frame.



IMPORTANT

To prevent loss of function calibration when disconnecting the sensor cables: Turn the ignition '**ON**'; Switch the system power '**ON**'; Go to System Screen 'select'; Select 'Set-Up'; Activate 'Shipping Mode'. (**See Section 5**).

- Switch off system power and ignition.
- Turn battery isolator switch '**OFF'**.(See P1-11).
- Disconnect the hydraulic fittings at the bulkhead '**A**', and '**B**' at the Roll Eject motor.
  Plug and cap all hydraulic fittings.
- Remove the Conveyor Drive Chain '**C**'.
- Remove the Bearing Bolts '**D**', both sides of the frame.
- Unplug the cables '**E**' from the: Cut-off, Slab End, Tooth Count , Auto-Steer and Down Pressure Sensors.
- Remove the three Soc.Hd cap screws '**G**', and remove Outer Tracking Rod '**F**'.
- Carefully lift the conveyor clear of the main frame.

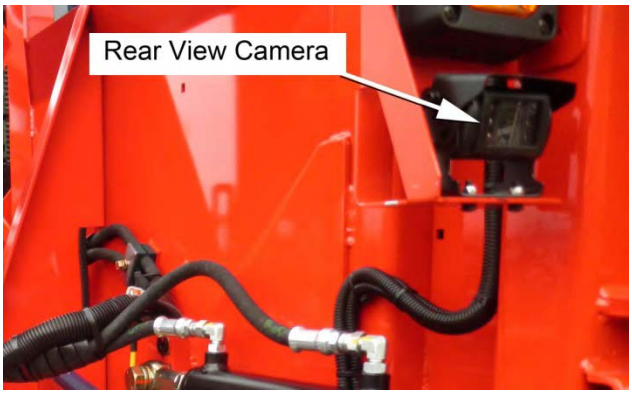


The machine can then be 'winched' onto a flatbed.
Using the **four tie-down rings**, (see page 1-11), chain down the machine and block the wheels.

Standard Rear View Camera.

The Rear View Camera is '**ON**' at all times when the engine is running.

Keep the camera lens clean to ensure a clear picture on the rear view screen.



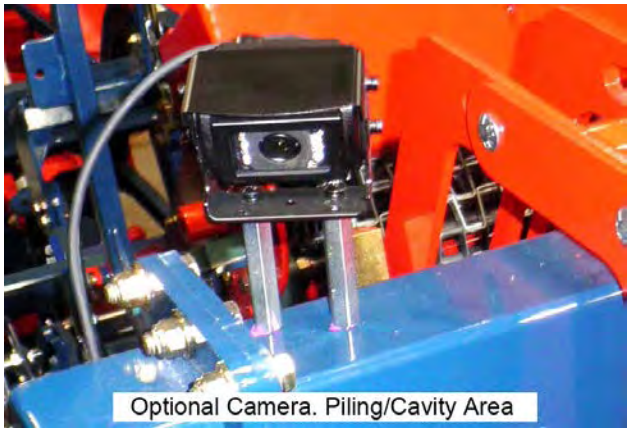
Optional Camera. Piling/Cavity Area.

The Optional Camera is located on the rear beam. The camera can be adjusted to show the area that the operator prefers.

Keep the lens clean to ensure a clear picture on the rear view screen.

NOTE

If the camera is retro-fitted in the field, installation instructions, included in the Kit, are also shown on page 1-17.



Interior Rear View Screen.
The operator must pay particular attention to the screen when reversing.

CAUTION

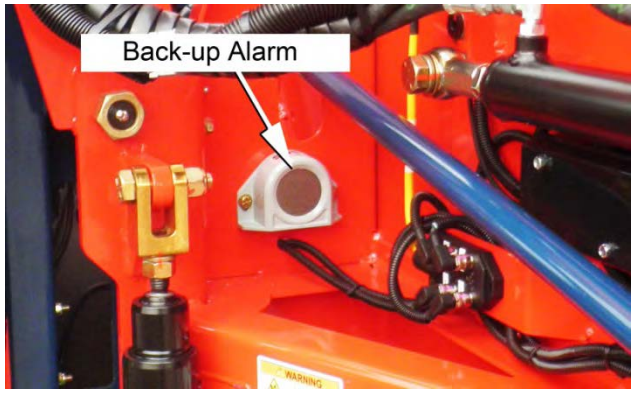
To prevent possible personal injuries or damage: The operator must be alert at all times to any persons or obstructions that may be in the vicinity of the machine.

Back-Up Alarm

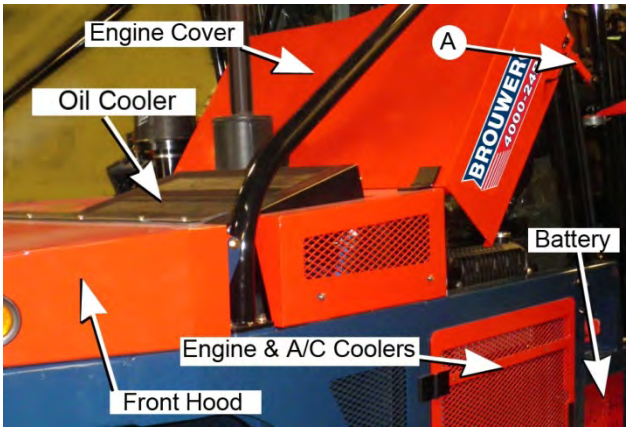
The Back-Up Alarm ' Warning Beeper' sounds when reverse is selected.

CAUTION

The operator must be aware of the warning.
If it fails to sound, the problem must be resolved before operating the machine.



Convenient access panels at the front of the machine allow for easy maintenance and service.



CAUTION

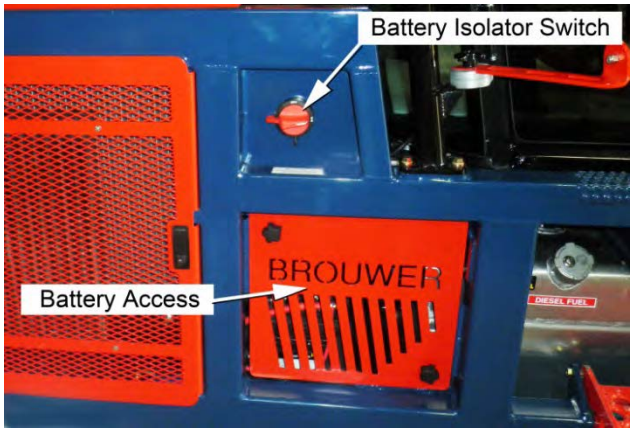
To prevent personal injury:
The Front Hood and Engine Access Cover must be secured when raised, with the safety supports provided - '**A**' and '**B**'.

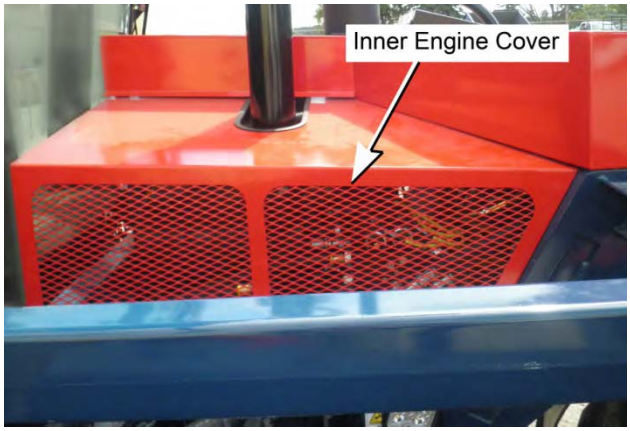
IMPORTANT

To prevent overheating:
Check regularly, particularly in dusty conditions, that the radiator and coolers are free of dust or debris.

Battery Access.

To access the battery remove Panel.

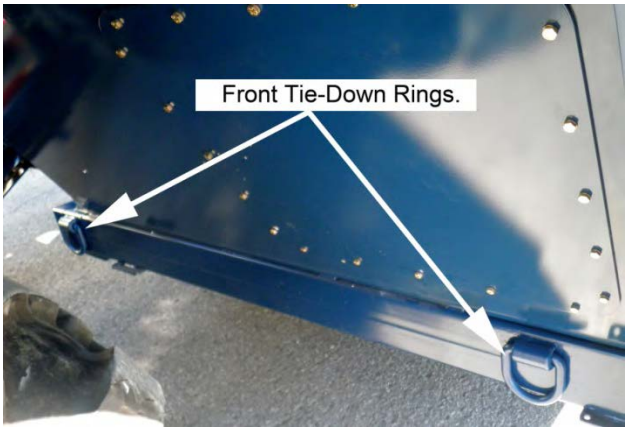


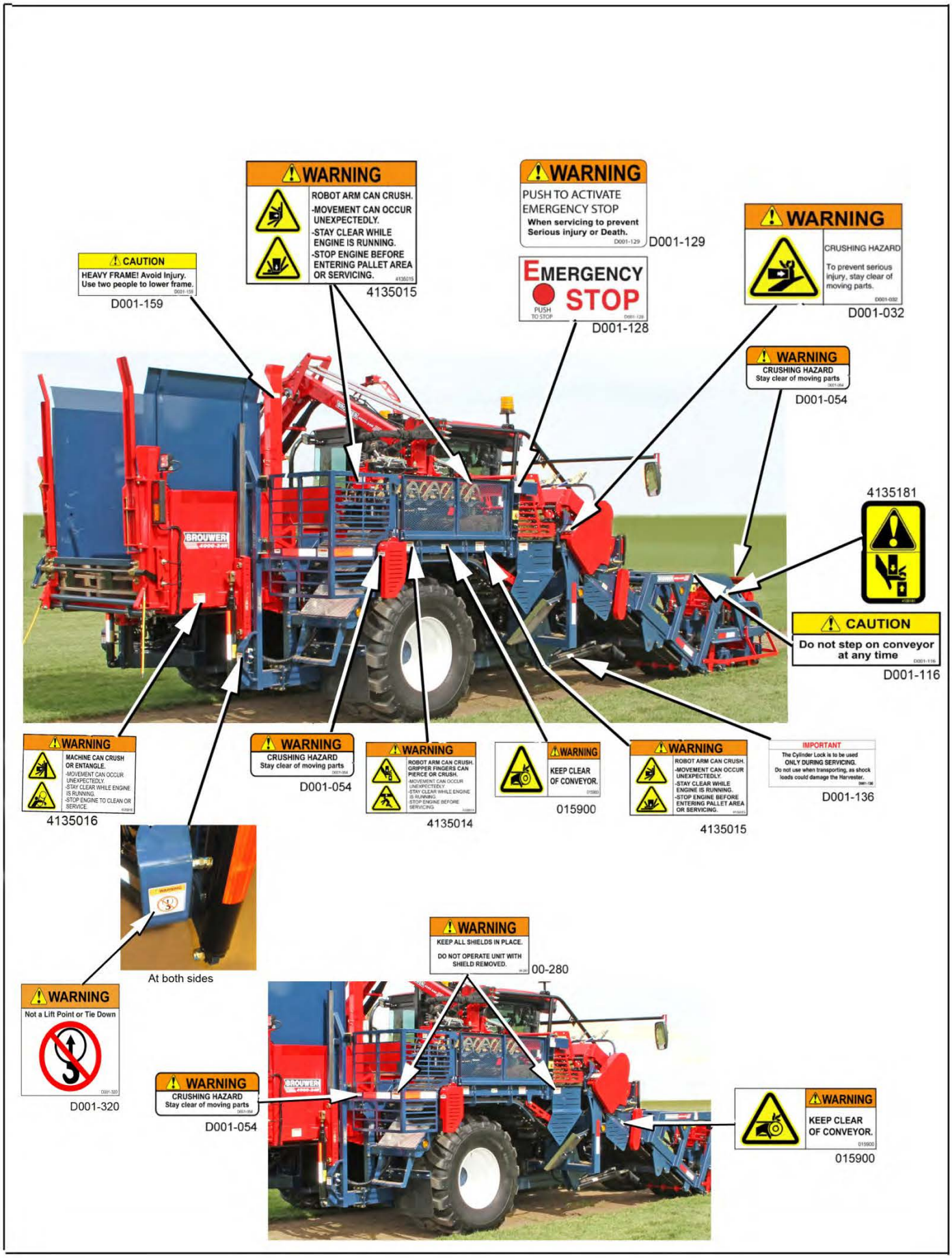


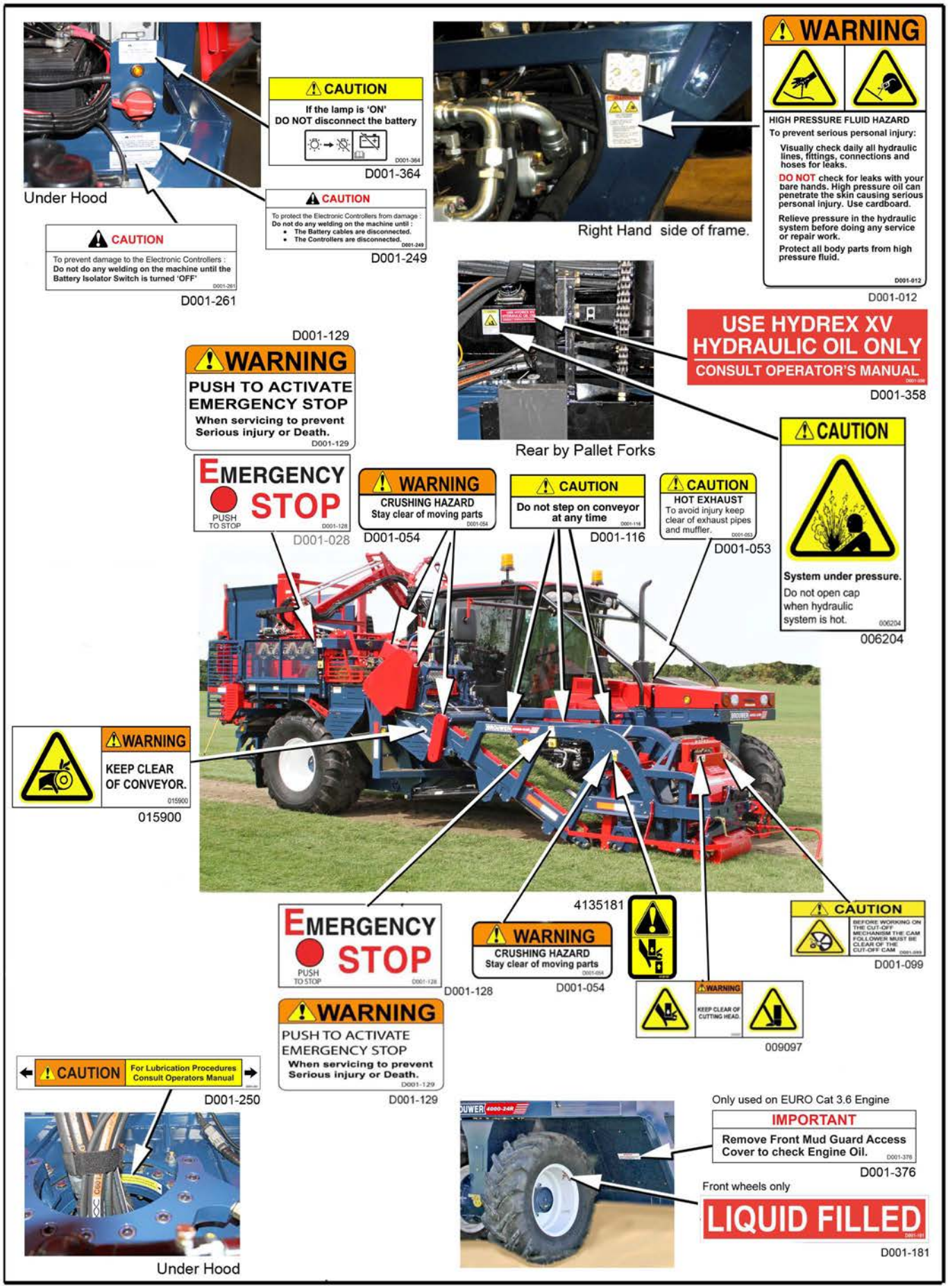
Safe Transport.

Use the Tie-Down Rings when transporting the machine.

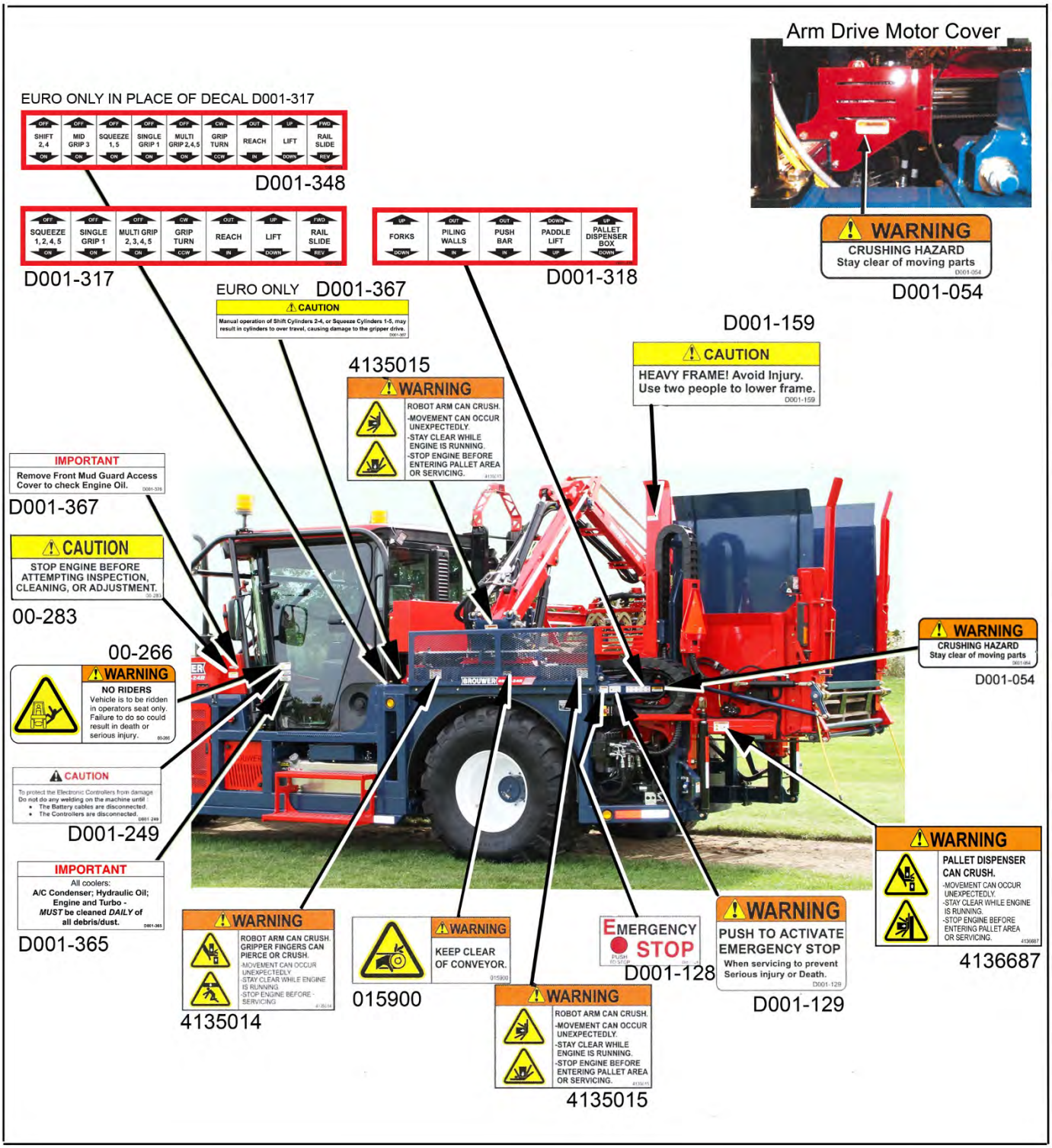
Rear Tie-Down Rings are located on the left and right side of the frame ahead of the rear wheels.




WARNING
ROBOT ARM CAN CRUSH.
-MOVEMENT CAN OCCUR UNEXPECTEDLY.
-STAY CLEAR WHILE ENGINE IS RUNNING.
-STOP ENGINE BEFORE ENTERING PALLET AREA OR SERVICING.
4135015
WARNING
PUSH TO ACTIVATE EMERGENCY STOP
When servicing to prevent Serious injury or Death.
D001-129
WARNING
CRUSHING HAZARD
To prevent serious injury, stay clear of moving parts.
D001-032
CAUTION
HEAVY FRAME! Avoid Injury. Use two people to lower frame.
D001-159
EMERGENCY STOP
PUSH TO STOP
D001-128
WARNING
CRUSHING HAZARD
Stay clear of moving parts
D001-054
4135181
CAUTION
Do not step on conveyor at any time
D001-116
WARNING
MACHINE CAN CRUSH OR ENTANGLE.
-MOVEMENT CAN OCCUR UNEXPECTEDLY.
-STAY CLEAR WHILE ENGINE IS RUNNING.
-STOP ENGINE TO CLEAN OR SERVICE.
4135016
WARNING
CRUSHING HAZARD
Stay clear of moving parts
D001-054
WARNING
ROBOT ARM CAN CRUSH. GRIPPER FINGERS CAN PIERCE OR CRUSH.
-MOVEMENT CAN OCCUR UNEXPECTEDLY.
-STAY CLEAR WHILE ENGINE IS RUNNING.
-STOP ENGINE BEFORE SERVICING.
4135014
WARNING
KEEP CLEAR OF CONVEYOR.
015900
WARNING
ROBOT ARM CAN CRUSH.
-MOVEMENT CAN OCCUR UNEXPECTEDLY.
-STAY CLEAR WHILE ENGINE IS RUNNING.
-STOP ENGINE BEFORE ENTERING PALLET AREA OR SERVICING.
4135015
IMPORTANT
The Cylinder Lock is to be used ONLY DURING SERVICING.
Do not use when transporting, as shock loads could damage the Harvester.
D001-136
At both sides
WARNING
KEEP ALL SHIELDS IN PLACE.
DO NOT OPERATE UNIT WITH SHIELD REMOVED.
00-280
WARNING
Not a Lift Point or Tie Down
D001-320
WARNING
CRUSHING HAZARD
Stay clear of moving parts
D001-054
WARNING
KEEP CLEAR OF CONVEYOR.
015900


Under Hood
CAUTION
If the lamp is 'ON'
DO NOT disconnect the battery
D001-364
CAUTION
To protect the Electronic Controllers from damage :
Do not do any welding on the machine until :
The Battery cables are disconnected.
The Controllers are disconnected.
D001-249
CAUTION
To prevent damage to the Electronic Controllers :
Do not do any welding on the machine until the Battery Isolator Switch is turned 'OFF'
D001-261
Right Hand side of frame.
WARNING
HIGH PRESSURE FLUID HAZARD
To prevent serious personal injury:
Visually check daily all hydraulic lines, fittings, connections and hoses for leaks.
DO NOT check for leaks with your bare hands. High pressure oil can penetrate the skin causing serious personal injury. Use cardboard.
Relieve pressure in the hydraulic system before doing any service or repair work.
Protect all body parts from high pressure fluid.
D001-012
Rear by Pallet Forks
USE HYDREX XV
HYDRAULIC OIL ONLY
CONSULT OPERATOR'S MANUAL
D001-358
D001-129
WARNING
PUSH TO ACTIVATE EMERGENCY STOP
When servicing to prevent Serious injury or Death.
D001-129
EMERGENCY STOP
PUSH TO STOP
D001-028
WARNING
CRUSHING HAZARD
Stay clear of moving parts
D001-054
CAUTION
Do not step on conveyor at any time
D001-116
CAUTION
HOT EXHAUST
To avoid injury keep clear of exhaust pipes and muffler.
D001-053
CAUTION
System under pressure.
Do not open cap when hydraulic system is hot.
006204
WARNING
KEEP CLEAR OF CONVEYOR.
015900
EMERGENCY STOP
PUSH TO STOP
D001-128
WARNING
CRUSHING HAZARD
Stay clear of moving parts
D001-054
4135181
CAUTION
BEFORE WORKING ON THE CUT-OFF MECHANISM THE CAM FOLLOWER MUST BE CLEAR OF THE CUT-OFF CAM
D001-099
WARNING
KEEP CLEAR OF CUTTING HEAD.
009097
WARNING
PUSH TO ACTIVATE EMERGENCY STOP
When servicing to prevent Serious injury or Death.
D001-129
CAUTION
For Lubrication Procedures Consult Operators Manual
D001-250
Under Hood
Only used on EURO Cat 3.6 Engine
IMPORTANT
Remove Front Mud Guard Access Cover to check Engine Oil.
D001-376
Front wheels only
LIQUID FILLED
D001-181

DECALS


Arm Drive Motor Cover
EURO ONLY IN PLACE OF DECAL D001-317
SHIFT 2,4
MID GRIP 3
SQUEEZE 1,5
SINGLE GRIP 1
MULTI GRIP 2,4,5
GRIP TURN
REACH
LIFT
RAIL SLIDE
D001-348
SQUEEZE 1,2,4,5
SINGLE GRIP 1
MULTI GRIP 2,3,4,5
GRIP TURN
REACH
LIFT
RAIL SLIDE
D001-317
FORKS
PILING WALLS
PUSH BAR
PADDLE LIFT
PALLET DISPENSER BOX
D001-318
WARNING
CRUSHING HAZARD
Stay clear of moving parts
D001-054
D001-054
EURO ONLY D001-367
CAUTION
Manual operation of Shift Cylinders 2-4, or Squeeze Cylinders 1-5, may result in cylinders to over travel, causing damage to the gripper drive.
D001-159
CAUTION
HEAVY FRAME! Avoid Injury.
Use two people to lower frame.
D001-159
4135015
WARNING
ROBOT ARM CAN CRUSH.
-MOVEMENT CAN OCCUR UNEXPECTEDLY.
-STAY CLEAR WHILE ENGINE IS RUNNING.
-STOP ENGINE BEFORE ENTERING PALLET AREA OR SERVICING.
IMPORTANT
Remove Front Mud Guard Access Cover to check Engine Oil.
D001-367
CAUTION
STOP ENGINE BEFORE ATTEMPTING INSPECTION, CLEANING, OR ADJUSTMENT.
00-283
WARNING
CRUSHING HAZARD
Stay clear of moving parts
D001-054
00-266
WARNING
NO RIDERS
Vehicle is to be ridden in operators seat only. Failure to do so could result in death or serious injury.
CAUTION
To protect the Electronic Controllers from damage
Do not do any welding on the machine until :
The Battery cables are disconnected.
The Controllers are disconnected.
D001-249
WARNING
PALLET DISPENSER CAN CRUSH.
-MOVEMENT CAN OCCUR UNEXPECTEDLY.
-STAY CLEAR WHILE ENGINE IS RUNNING.
-STOP ENGINE BEFORE ENTERING PALLET AREA OR SERVICING.
4136687
IMPORTANT
All coolers:
A/C Condenser; Hydraulic Oil;
Engine and Turbo -
MUST be cleaned DAILY of all debris/dust.
D001-365
WARNING
ROBOT ARM CAN CRUSH. GRIPPER FINGERS CAN PIERCE OR CRUSH.
-MOVEMENT CAN OCCUR UNEXPECTEDLY.
-STAY CLEAR WHILE ENGINE IS RUNNING.
-STOP ENGINE BEFORE SERVICING
4135014
WARNING
KEEP CLEAR OF CONVEYOR.
015900
EMERGENCY STOP
PUSH
D001-128
WARNING
PUSH TO ACTIVATE EMERGENCY STOP
When servicing to prevent Serious injury or Death.
D001-129
WARNING
ROBOT ARM CAN CRUSH.
-MOVEMENT CAN OCCUR UNEXPECTEDLY.
-STAY CLEAR WHILE ENGINE IS RUNNING.
-STOP ENGINE BEFORE ENTERING PALLET AREA OR SERVICING.
4135015

WARNING

To prevent serious injury or death the operator must read the safety warnings and instructions in the Machine and the Engine Operator's manuals. The manuals must be kept on the machine at all times.

- The operator ***MUST NOT*** leave the operator's seat while the engine is running - the system will return to neutral and the brakes will apply.
- ***NO ONE*** must attempt to make any adjustments, free any jammed mechanism or clear debris paticularly in the vicinity of the Gripper Head, Robotic Arm and the Pallet Injection area while the engine is running.
- Bystanders must be kept clear of the machine when it is operating.
- When leaving the machine unattended: Place the Control Handle in ***NEUTRAL***, stop all functions, lower the Conveyor and Pallet Forks to the ground and the Gripper Head onto rolls of sod on the Index Conveyor. Stop the engine, remove the ignition key and lock the cab door.
- Turn the battery Isolator Switch to ***OFF*** and lock it in place.

D001-222

CAUTION

To prevent damage to the Electronic Controllers :
Do not do any welding on the machine until the Battery Isolator Switch is turned 'OFF'

D001-261

IMPORTANT

The oil in the Torque Hubs must be changed after the first 50 hours of operation and then every 1000 hours.
Refer to the Operator's Manual Section 4, Page 4-03 for the recommended procedure.

D001-263

202525

015499

D001-019

WARNING

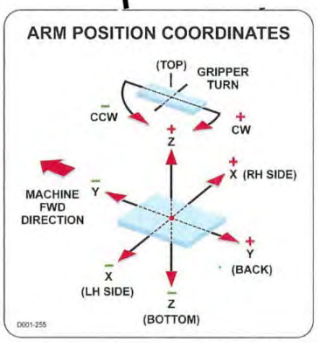
Switch the tractor engine **'OFF'** before working on the electrical system.
Failure to do so can result in serious burns and damage to components due to electrical 'shorts'.

D001-114

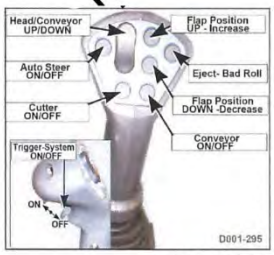
D001-114

BROUWER

D001-302



D001-255



D001-295

This machine is covered by one or more of the following patents:

U. S. Patents

3,590,927	4,345,659	5,775,436
3,790,096	4,621,696	6,056,064
4,015,566	4,832,130	
4,018,287	4,944,352	
4,029,152	4,903,778	

Other patents pending.
Also patented in other countries.

THIS MACHINE CANNOT BE COPIED IN WHOLE OR IN PART FOR OWN USE OR RESALE.

BROUWER
EQUIPMENT BUILT FROM EXPERIENCE

015899

015899

SYS. POWER	ROAD / HARVEST	BRAKE	REV.LIGHTS

D001-192

Upper Cab Right Side of Rear View Screen

D001-277

D001-279

D001-280

BROUWER
4000-24R

ESTD. 1972
BROUWER
kesmac
OVER 50 YEARS

D001-396

D001-278

D001-279

OPTIONAL CAMERA INSTALLATION
Piling Cavity and Gripper Head area.

Fig.1
Place the Camera Mounting Bracket '**A**' on the beam, positioned to the operator's preference.
Mark the location of two holes '**B**'.
Drill and tap the two holes to 10-32.

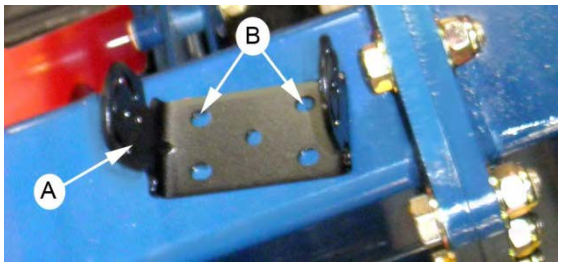


Fig.1

Fig.2
Put Blue Loctite on the threads and screw the two Stand-offs into place.
Attach Camera to the Stand-Offs.(fasteners in kit).
Feed the camera cable down to the removable panel at the lower right side of the cab. (See Fig.3).

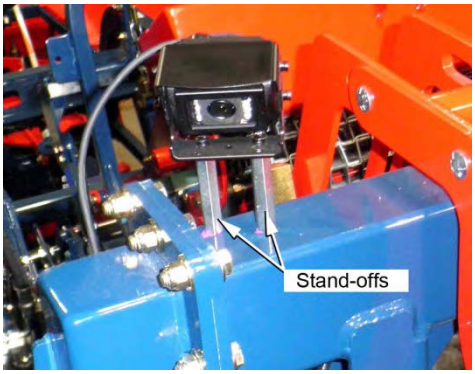


Fig.2

Fig.3
Remove the lower rear panel and drill a 13/16in. hole in the ***center*** of the panel. Feed the camera cable through the panel into the cab.
Put silicone sealant on the cable grommet and fit it into the panel. Refit the panel.

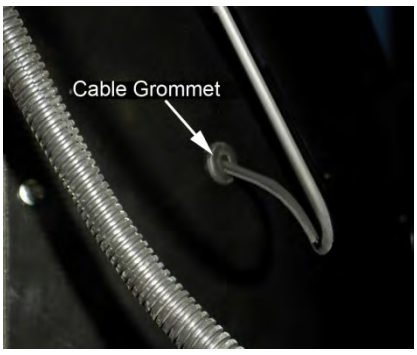


Fig.3

Fig.4
Remove the two bolts '**C**' attaching the Cup-holder.
Pull the Closing Panel 'D' forward to remove it.
Remove Finishing Piece 'E', (held in place with Velcro).

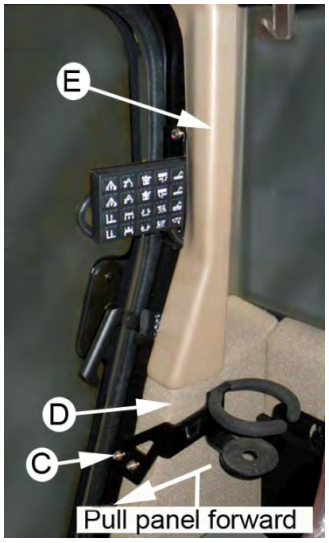


Fig.4

Fig.5

Pull the Cable up from the lower panel, (See Fig 3), sufficient to connect it to the plug '**F**' in the harness, labeled **'CAMERA 2'**
Pug labeled '**CAMERA 1'** is for the standard back-up camera.

.

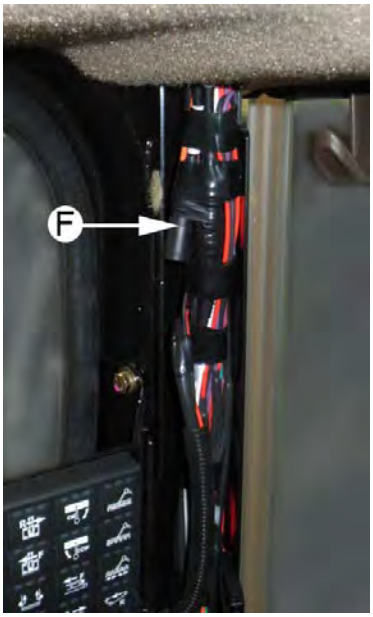


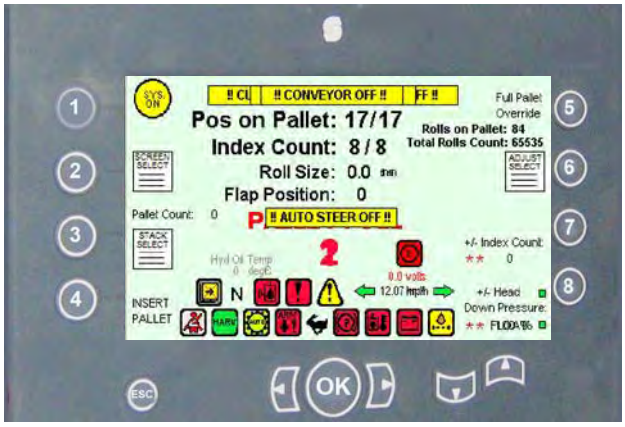
Fig.5
Replace the closing panel and finishing piece.
Re-attach the Cup-holder.

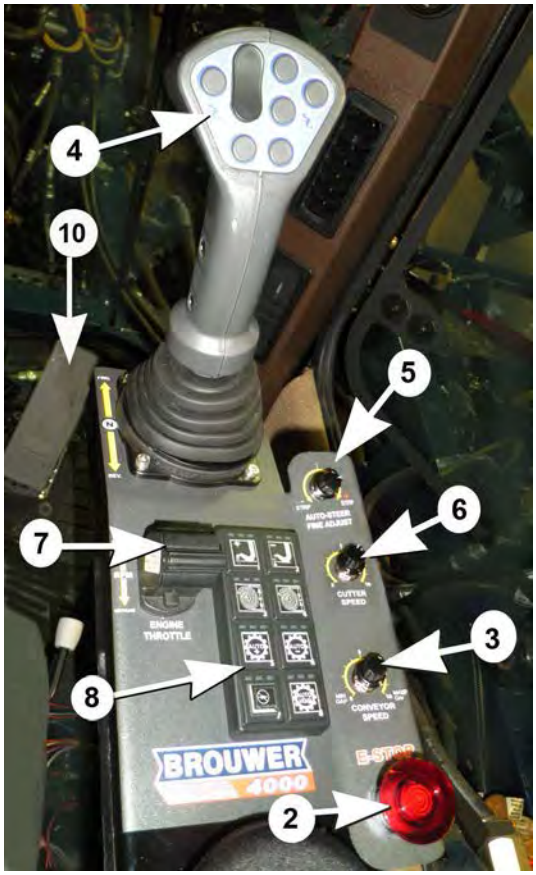
SECTION 2

Cab Harvesting Controls

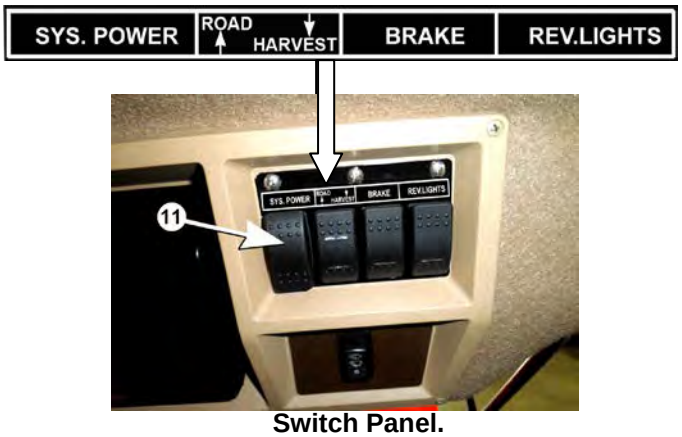
1. System Display. Controller '**A**'. See Section 3. for Operation.
2. Emergency '**STOP**' **-** Push to '**STOP**'. **-** Pull to '**RESET**'.
2a, 2b, 2c. 'Outside' E-STOPS.
3. Conveyor Speed.
4. Control Handle. See page 2-02.
5. Auto Steer Fine Adjust.
6. Cutter Speed.
7. Engine RPM.
8. 8-Pad Control Panel. See Page 2-02.
9. 20 Pad Control Panel. See Page 2-02.
10. Brake/Clutch/Inch Pedal.
11. Switch Panel.

1. Cab - System Display. Controller 'A'.





Cab Console.



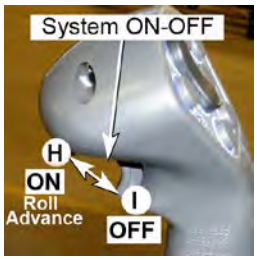
Switch Panel.

20-Pad Control.

'Outside' E-STOPS.

Control Handle Operating Buttons & Trigger.

Auto Mode :

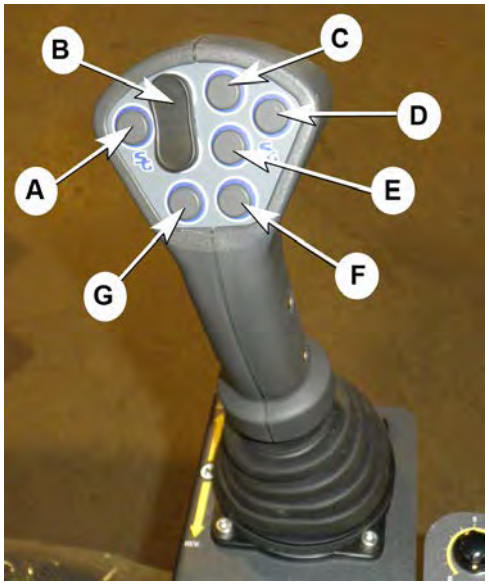


- **A.** Auto Steer. 'ON-OFF'
- **B.** Head/Conveyor 'Up/Down'.
- **C**. Flap Position 'Up'. (Increase).
- **D.** Eject – Bad Roll./Increased Engine RPM.**
- **E.** Flap Position 'Down'. (Decrease).
- **F.** Conveyor 'ON/OFF'.
- **G.** Cutter. 'ON-OFF'.
- **H.** Trigger - System 'ON'/Roll Advance.
- **I.** Trigger - System 'OFF'.

** Conveyor 'UP' & Auto Mode 'OFF - when in harvest mode.

NOTE 1. In 'Roading' Mode: 'D' will be High Speed 'ON/OFF'.

2. For Euro-Spec machines refer to page 2-05.

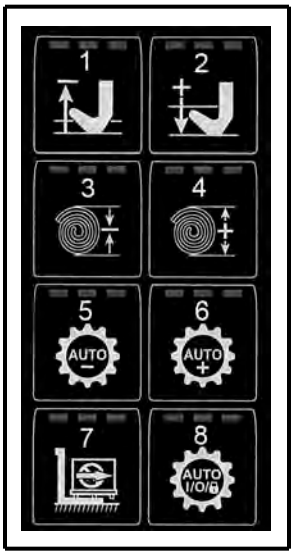


Control Handle

Console Control - 8 Pad.

1. Depth of Cut 'Decrease'.
2. Depth of Cut 'Increase'.
3. Roll Size 'Decrease'
4. Roll Size 'Increase'.
5. Auto Drive Speed 'Decrease'.
6. Auto Drive Speed 'Increase'.
7. Hold/Release Pallet Unload.
8. Auto Drive 'ON-OFF' & Hold to Save Speed.

.



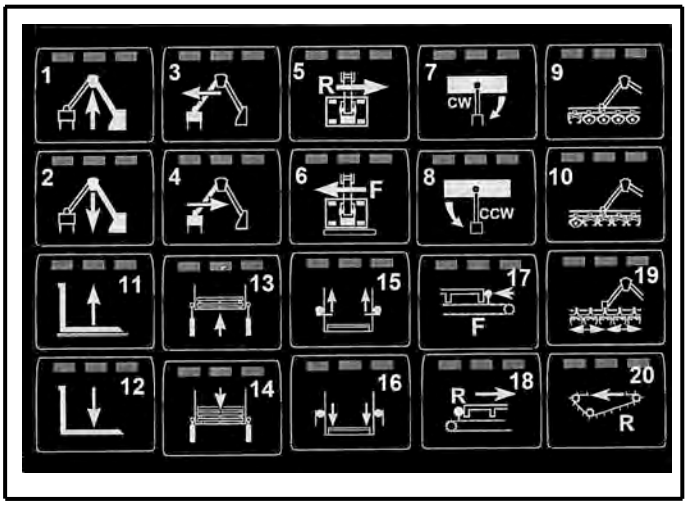
Console Control - 8 Pad

Cab Control - 20 Pad.

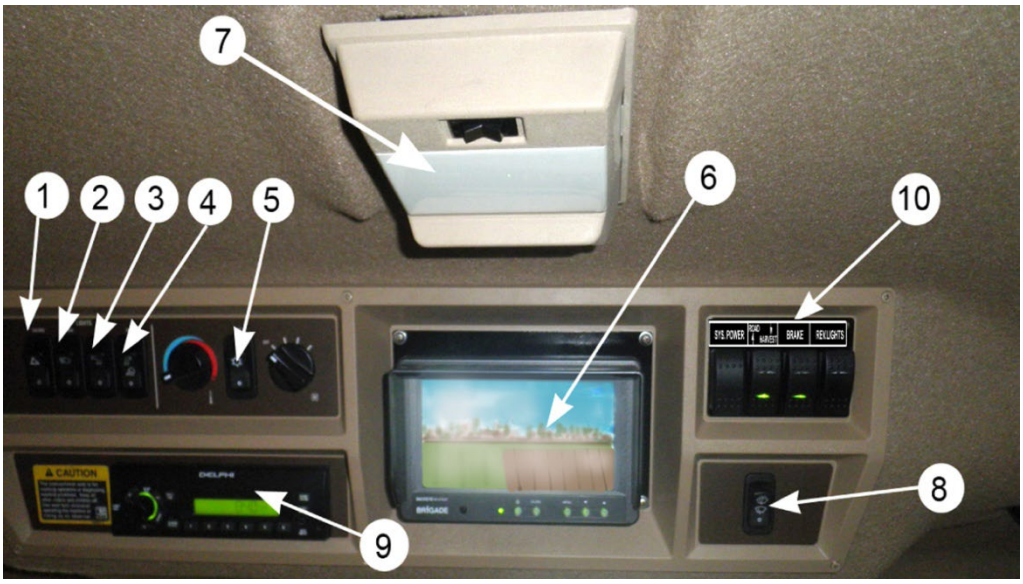
1. Arm Lift 'UP'.
2. Arm Lift 'DOWN'..
3. Arm Reach 'OUT'
4. Arm Reach 'IN'.
5. Arm Slide 'BACK'.
6. Arm Slide 'FORWARD'.
7. Gripper Turn 'CW'.
8. Gripper Turn 'CCW'..
9. Multi Grip 'ON/OFF'.
10. Single Grip 'ON/OFF'.
11. Forks 'UP'.
12. Forks 'DOWN'./**
13. Injector 'UP'.
14. Injector 'DOWN'.
15. Paddles 'UP'.
16. Paddles 'DOWN'.
17. Push Bar 'FORWARD'.
18. Push Bar 'REV'.
19. Squeeze 'ON/OFF'.
20. Index Conveyor – 'REV'.

** Stop Eject Conveyor (Auto Mode).

NOTE: For Euro Spec machines refer to page 2-05.



Cab Control - 20 Pad

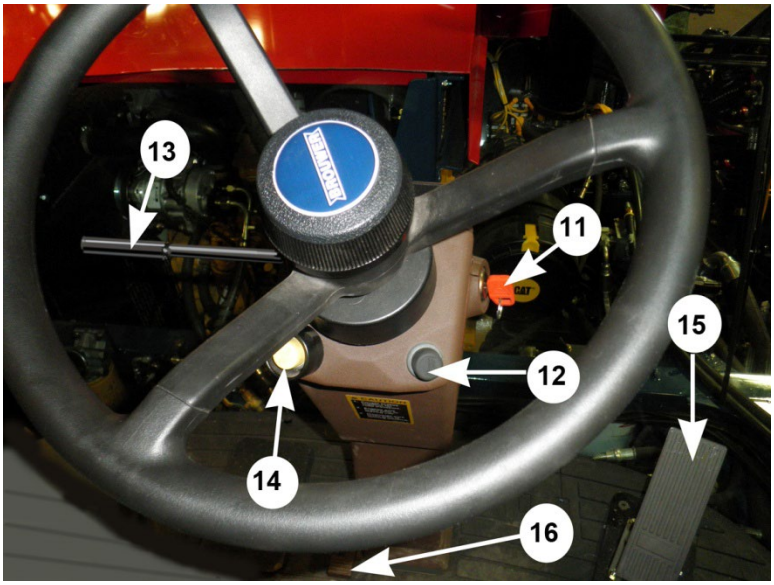


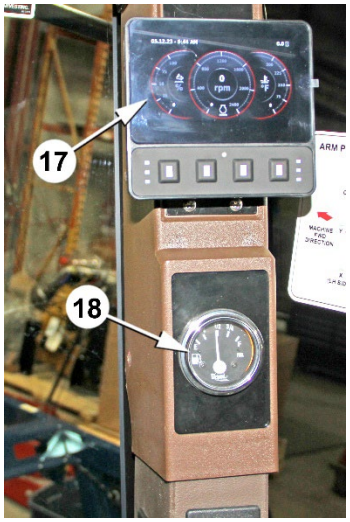
1. Hazard Lights. **2.** Road Lights. **3.** Field Lights. **4.** Work Lights.

5. A/C Controls. **6.** Rear View Screen. **7**. Cab O/Head Light .

8. Windshield Washer/Wiper. **9.** Radio.(See Section 8. Owners Manual).

10. Switch Panel. (See page 2-01).





11. Ignition Switch. **12.** Horn. **13**. Turn Signals. **14**. Engine 'START'.

15. Brake/Inch/Clutch. **16**. Pedestal Adjust. **17**. Engine Information Center.

18. Fuel Gauge.

'EIC User Manual'. See Section 10

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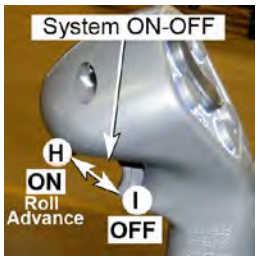
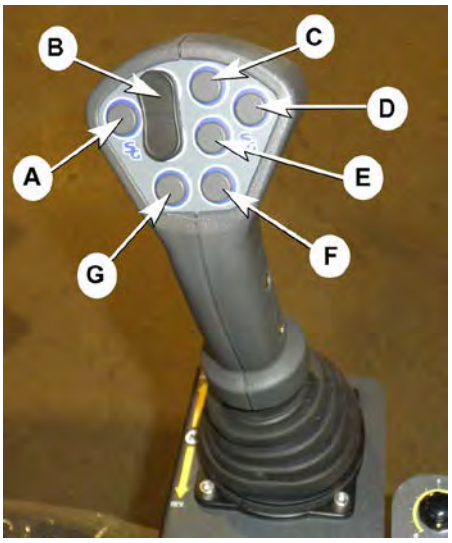
CAB CONTROLS – EURO SPEC Machines

Control Handle Operating Buttons & Trigger.

Auto Mode :

- **A.** Auto Steer. 'ON-OFF'
- **B.** Head/Conveyor 'Up/Down'.
- **C**. Flap Position 'Up'. (Increase).
- **D.** Eject –Bad Roll./Increased Engine RPM**.****
- **E.** Flap Position 'Down'. (Decrease).
- ***F.** Conveyor 'ON/OFF'.
- ***G.** Cutter. 'ON-OFF'.
- **H.** Trigger - System 'ON'/Roll Advance.
- **I.** Trigger - System 'OFF'.





Control Handle

***EURO SPEC machines when in 1.0mx1.2m stacking configuration.**

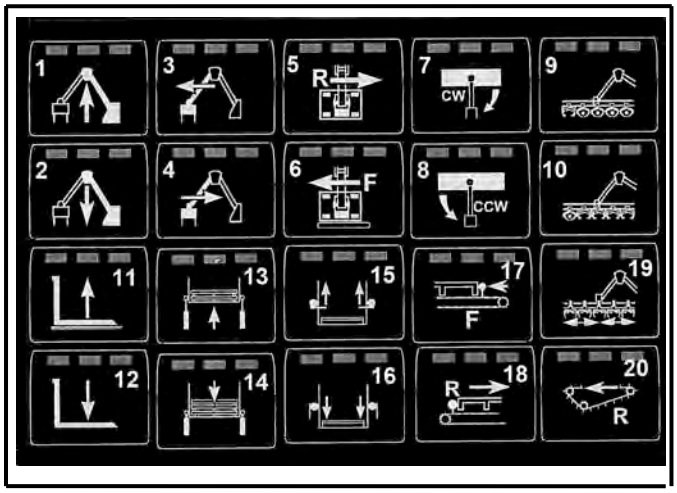
Manual Mode: **F.** Shift position for: 1, 2, 4, 5, 'ON/OFF'.
G. Mid Grip 3. ON/OFF'.

** Conveyor 'UP' & Auto Mode 'OFF' when in harvest mode.

NOTE: In 'Roading' Mode '**D**' will be High Speed 'ON/OFF'.

Cab Control - 20 Pad.

- **1.** Arm Lift 'UP'.
- **2**. Arm Lift 'DOWN'.
- **3.** Arm Reach 'OUT'
- **4.** Arm Reach 'IN'.
- **5.** Arm Slide 'BACK'.
- **6.** Arm Slide 'FORWARD'.
- **7.** Gripper Turn 'CW'.
- **8.** Gripper Turn 'CCW'.
- **9.** EURO SPEC. See below.
- **10**. EURO SPEC. See below.
- **11.** Forks 'UP'.
- **12.** Forks 'DOWN'/ Stop Eject Conveyor (Auto Mode).
- **13.** Injector 'UP'.
- **14**. Injector 'DOWN'.
- **15.** Paddles 'UP'.
- **16.** Paddles 'DOWN'.
- **17.** Push Bar 'FORWARD'.
- **18.** Push Bar 'REV'.
- **19.** EURO SPEC. See below.
- **20.** Index Conveyor – 'REV'.



Cab Control - 20 Pad

EURO SPEC Machines - 20 Pad Control.

9. When in1.2mx1.2m stacking configuration Multi Grip 2, 3, 4, 5, ON/OFF.
When in 1.0m x 1.2m stacking configuration Multi Grip 2, 4, 5, ON/OFF.

10. When in 1.2m x 1.2m or 1.0mx1.2m stacking configuration Single Grip ON/OFF.

19. When in 1.2m x 1.2m or 1.0m x 1.2m configuration Sqeeze postion for 1, 2, 4, 5.'ON/OFF.

OPERATION
SECTION 3.

Initial Set-Up and Adjustment:
Robotic Arm and Pallet Dispenser.

WARNING

Safety Guards may have been removed for clarity. Do not operate the Harvester if safety guards are missing or damaged. To do so could result in serious personal injury.

4-inch Feed Roller

Roller **'A'** helps in feeding the sod into the Starter Gate.
It should be kept free of grass and mud.
It is driven by the Mid-Idler Sprocket Shaft..

To adjust the Roller:

- Place a piece of sod under the Roller. With the Roller resting on the sod, adjust the Bump Stops **'B'** to allow 1/8 inch clearance between the Bump Stops and the Frame.
  For weak, or thin turf, requiring less roller pressure, adjust the Bump Stops **'down'**, onto the frame raising the Roller to reduce pressure on the turf.

Starter Tray

When the end of a slab of sod '**C**' passes under Sensor **'D',** (**see note**), it signals the computer to :

- count the number of teeth, ('tooth count'), that the operator has pre-set
- 'stop' the Roll Eject Mat, (that ejects the scrap roll onto the Scrap Conveyor as the Index Conveyor moves back).

NOTE: Refer to page 3-18 for sensor calibration.
If the unit has a mechanical sod end sensor installed, see page 3-18A for set-up and adjustment

Starter Tray Bars **'E'**, behind the Starter Gates '**F**', have Pins '**G**' that protrude 1/4 in. below the Bar.
The pins grip the turf as it starts to 'roll-up'.
If the turf passes through, but does not 'roll-up', tap the pins **'IN'** until they protrude 1/2 to 5/8 in.
The pins wear with use and must be adjusted or re-placed as required.
In tender sod the pins may hold the underside of the sod too long, causing a loose roll, incorrect roll flap position, partially rolled or 'incomplete' rolls, in this case the pins should be 'raised'.
Trial will determine the best pin positions.

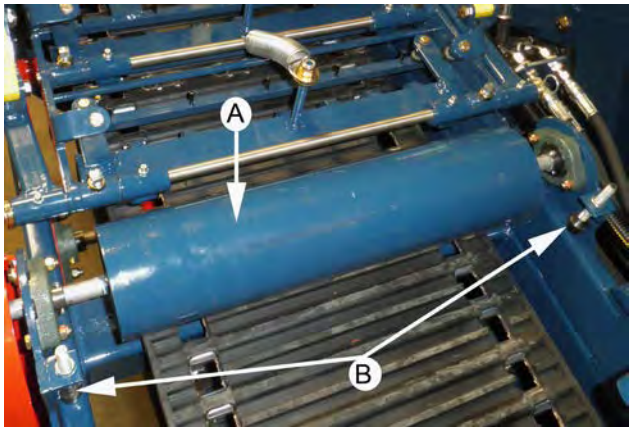
- Maintain 4 to 6 inches between the sod pieces
- Do not allow dirt to build up on the Conveyor, it will cause the Starter Gate to open early.

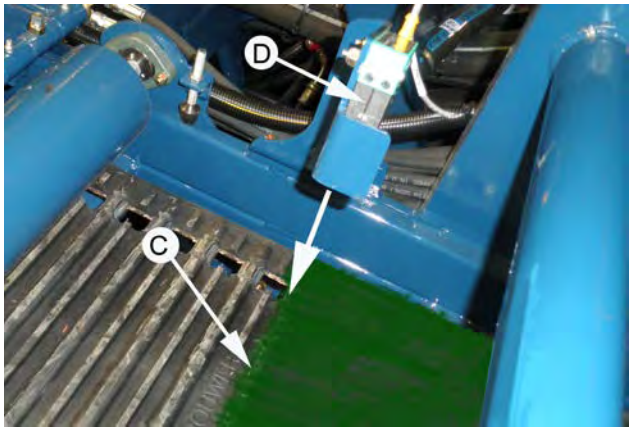
Double Starter Gates.

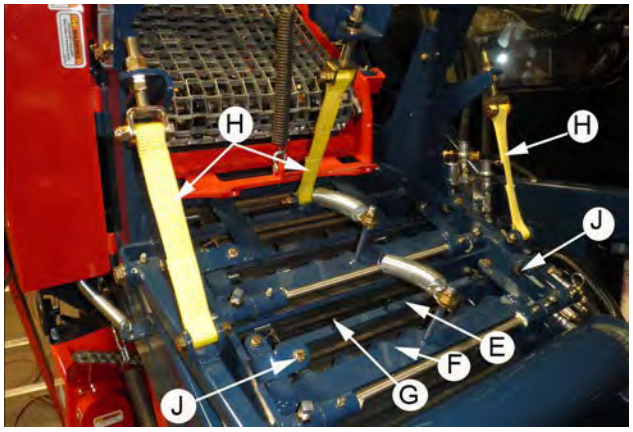
The Starter Gates **'F'** must be positioned approximately 1/8 inch clear of the Conveyor Mat, measure at the join 'splice' in the Mat, ie. **its thickest point.**
Gate clearances are set with the adjustable straps **'H'. The Gate must not touch the mat.**
The Starter Gate Stops **'J',** prevent the bottom edge of the Gates lifting higher than the top face of the Bars '**E**'.

WARNING

To prevent possible serious injury : No one should step on the conveyor, or attempt to free any jammed turf rolls or debris, while the engine is running.



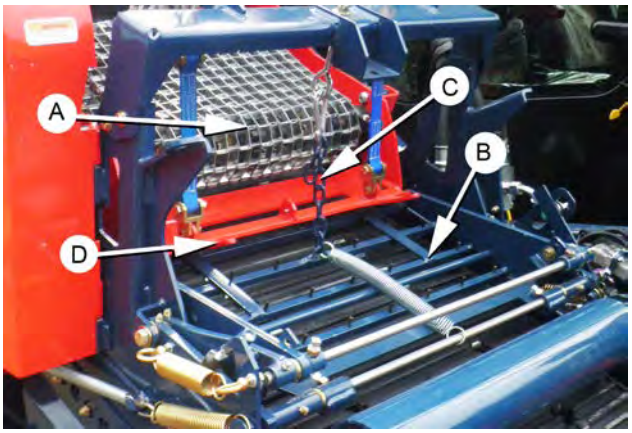




OPERATION

Roll-Up Conveyor

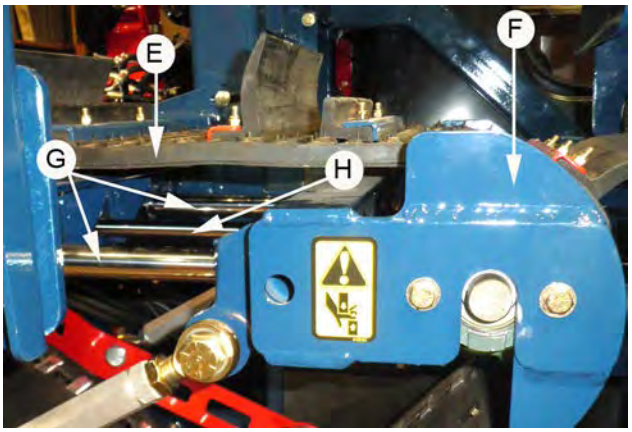
The Roll–Up Conveyor '**A**' continues the Roll–Up action after the Roll has passed through the Starter Trays '**B**'.
Adjust the Hanger Chain '**C**' to allow 2 to 2 ½ inches clearance between the bottom of the Roll-Up Frame '**D**' and the upper Starter Tray '**B**'.



Index Conveyor

The Index Conveyor '**E**' is synchronized to the Main Conveyor, Robotic Arm and Bad Roll 'Ejection' Cylinder '**H**'. When a Roll is ready to be transferred to the Index Conveyor, the Index Conveyor automatically rolls back 'one position', to accept the completed roll.

Bad Roll Ejection.
To '**eject**' a bad roll of sod, the Roll Eject mat starts and the Idler End Assembly '**F**' is pulled back on Guide Rods '**G**' by Cylinder '**H**', allowing the reject roll to drop onto the ground.
To activate the Roll Ejection refer to the Controls Section, page 2-02.



WARNING

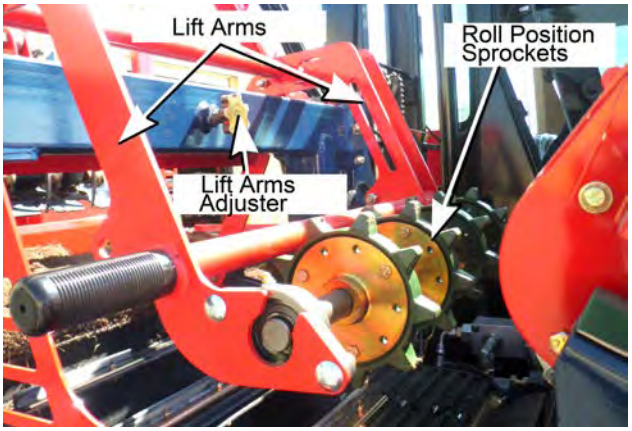
Do not attempt to clear jammed rolls or debris while the machine is running. Keep all bystanders well clear of the Index Conveyor, Gripper Head and Pallet Injection area. Failure to do so could result in serious injury or death.

Roll Position Sprockets.

IMPORTANT

The Roll Position Sprockets are adjusted with the Lift Arms Adjuster to 'just' hold the Roll. They must not 'compress' it.

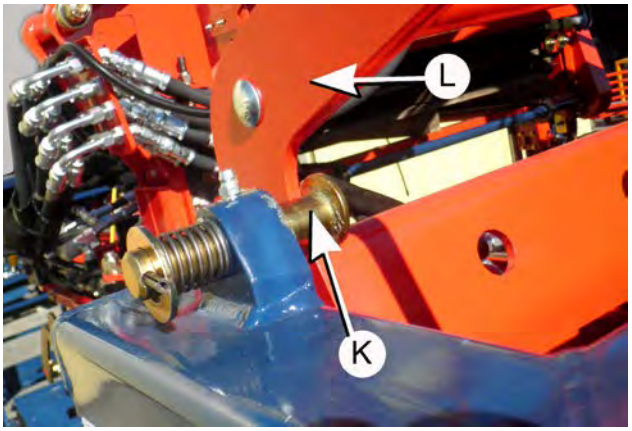
The Roll Position Sprockets hold the sod roll as it is transferred to the Index Conveyor.
The sprockets automatically lift when a bad roll is ejected.



CAUTION

To prevent possible personal injury:
If the Roll Position Arms are raised manually, to clear debris or jammed rolls from the Index conveyor, ensure that the Locking Pin '**K**' is pushed in and fully engaged against the Lift Arm '**L**'.

Roll Flap Position.
The position of the Roll Flap is set using the control buttons on the Control Handle, (see page 2-02).
The sensing 'teeth' are on a Sprocket located at the right rear of the Main Conveyor. (See page 5-08).
The Proximity Sensor senses and counts the teeth.
Increasing the 'tooth count' moves the Roll Flap '**counter-clockwise'**.
Decreasing 'tooth count' moves the Roll Flap '**clock-wise**'.



Adjust the location of the Roll Position Sprockets to suit the selected position of the Roll Flap.

Robotic Arm and Gripper Head

The hydraulic functions of the Robotic Arm **'A'** and Gripper Head '**B**' are controlled by a Controller in the Main Control Box. See Section 5.
The Arm 7-Bank Arm Control Valves '**C**', are located ahead of the left rear wheel. See Section 4. P4-09/10.

The relevant Controller provides positioning co-ordinates for:

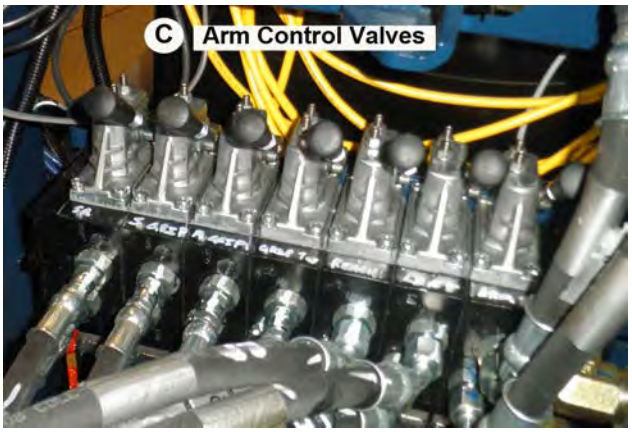
- Robotic Arm - 'Lift'
- - 'Reach'
- - 'Slide'
- Gripper Head - 'Rotation'

The Robotic Arm '**A**', responding to Controller signals, picks up and transfers the rolls from the Index Conveyor '**D**', to the Pallet.

The Controller also controls :

- the multi-grip, single-grip and 'squeeze' functions of the Gripper Fingers '**E**'.

Cab Control Handle.
For operating functions e.g. Auto-Steer ; Conveyor ; Flap Position, Cutter Head; etc…See pages 3-10/11.



Pallet Lift Forks.

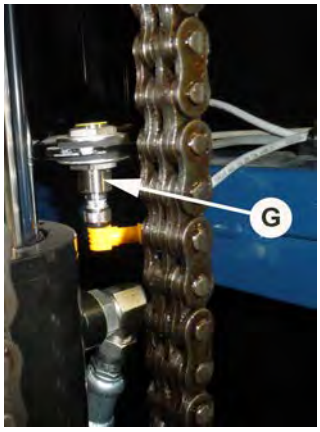
There are two Proximity Sensors that sense the programmed positions of the Lift Forks Mast.

- Mast 'HEIGHT' Sensor '**F**'.
- Mast 'BOTTOM' Sensor '**G**'.

The Pallet Forks lower automatically, as layers of sod are added to the pallet.
When stacking is complete the loaded pallet is lowered to the ground.
The forks then return to the '**MID**' position of the Pallet Injector- ready for a new pallet.

See following page for Pallet Injector.

NOTE
Sensor '**H**' is the antenna for the optional GSM Remote System.



Pallet Dispenser.

DANGER

Keep all bystanders clear. Do not allow anyone to enter between the Pallet Dispenser and the Harvester. **To do so could result in serious injury or death.**

NOTE

A Pallet Weight Indicator is available as an option. This option allows the operator to check the weight of each pallet. The correct truck/trailer weight is necessary when the unit is passing through highway weight checking stations. See Pages 3-25/26.

Operating Position

The Pallet Dispenser holds up to 15 pallets for transfer to the Pallet Lift Forks.

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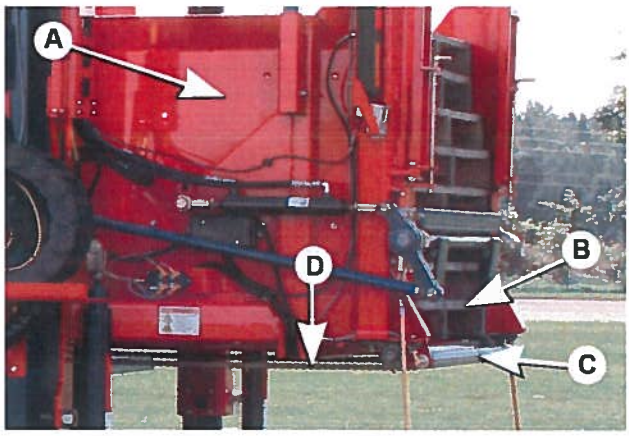
Insertion of the ***first*** pallet is controlled by the operator with 'inputs' on the cab control handle
Thereafter pallet insertion is automatic.
(See Controls Section page 2-02).

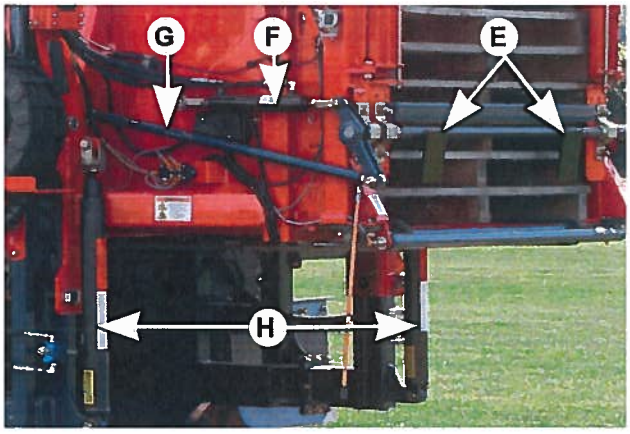


Pallet Dispenser – Operating Position

Pallets 'B' are inserted with Push Bars '**C**' that are attached to hydraulically driven Chains '**D**'.
Push Bar operation is controlled by Proximity Sensors through Multi Port block '**C5**' to a Controller (**D**), in the main Electrical Control Box.

Pallet Lift/Drop Paddles.

The Lift/Drop Paddles '**E**' are operated by Cylinder '**F**', with Linkage '**G**' to the front paddles.
Pallet Dispenser height is controlled by two-stage Cylinders '**H**'.



Lift/Drop Paddles

WARNING

The Pallet Dispenser will lower automatically when the machine is in 'Road' Mode and exceeds 8 kph. (5mph).
If the operator observes that this does not occur – check that the Pallet Dispenser 'High', 'Mid', and 'Bottom' Proxy Sensors are functioning, and that there is no dirt or debris between the sensors and their targets. If after these checks the Dispenser does not lower a service call is necessary.

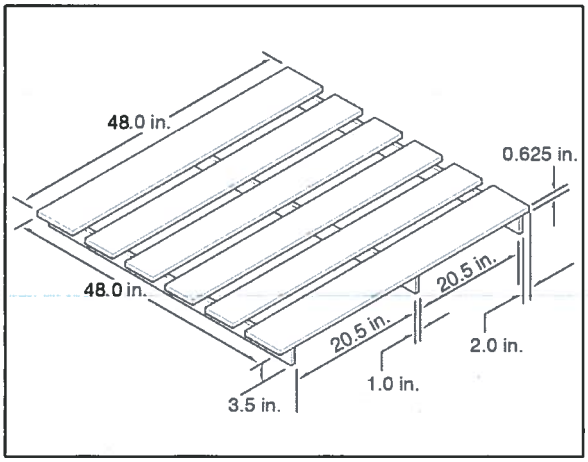
Pallet Specifications

Standard Pallet.

IMPORTANT

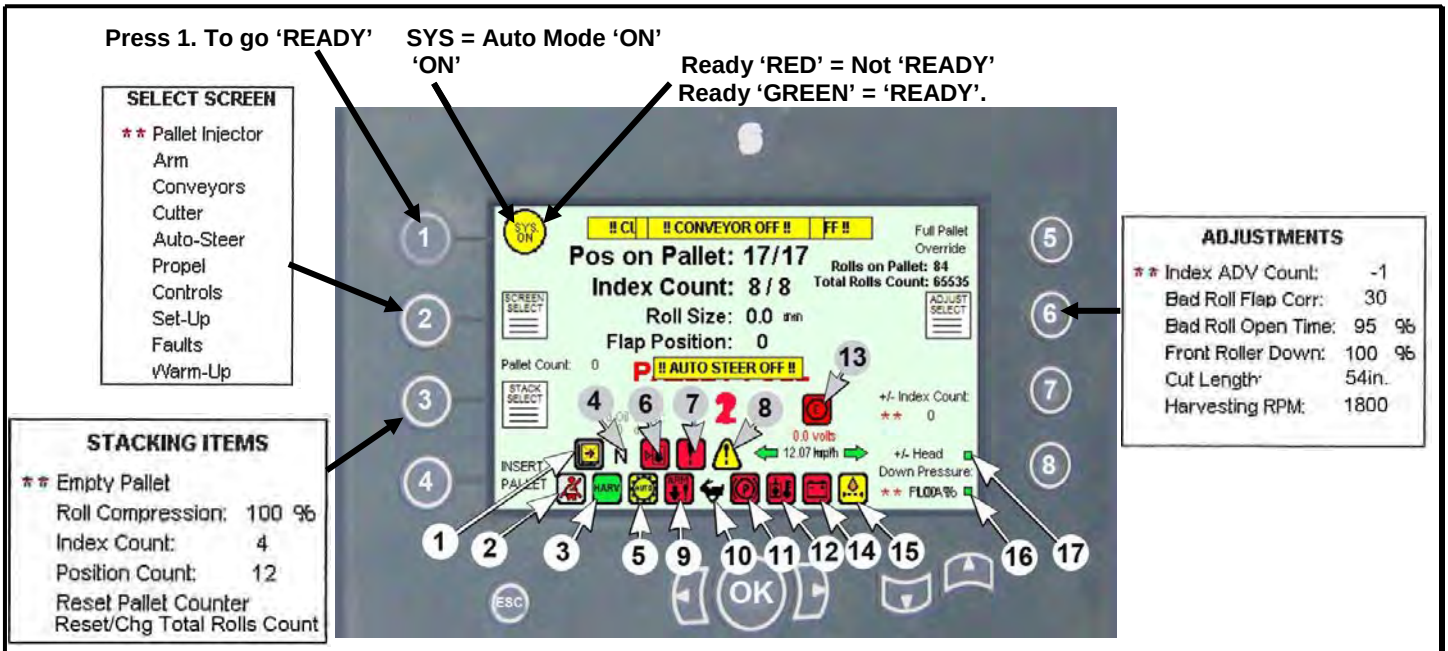
To ensure proper operation of the Pallet Dispenser, pallets must conform to the dimensions shown. They must be in good condition, with no loose or damaged boards.

Pallets must be able to support 4000 lbs.



Standard Pallet Specifications

Harvest 'Power-Up' Screen.



Harvest Main Screen.

1. Pallet 'HOLD'. **2.** Seat Switch **3**. Machine Mode. **4**. Control Handle 'NEUTRAL'. **5**. Auto Drive.
6. Low Hyd. Oil Level. **7**. 'FAULT'. **8**. 'WARNING'. **9**. Arm Lift Press'. 'ON'. **10**. High Speed. **11**. Park Brake.
12. High Hydraulic Oil Temp'. **13**. E-STOP Switch. **14**. Low Voltage. **15**.Pump (P1) Charge Pressure Filter.
16. Conveyor Down Pressure Status. **17**. Conveyor 'DOWN' PROX.

Screen Buttons –Typical for all screens.

Pre-operation Warm-Up procedure.

IMPORTANT

Before operating the machine for harvesting it is important that the Hydraulic Oil is brought up to operating temperature. If the ambient temperature is **below 75 deg.F (24 C).** proceed as follows:

DANGER

When carrying out the following procedures all bystanders ***MUST BE KEPT CLEAR*** of the machine. Failure to observe this precaution could result in serious injury or death.

Fig.1 **Valid Engine Data. (Typical).**

To start the Engine:

IMPORTANT

Always start the engine with the System Power '**OFF**'.

- Turn the ignition key to '**start**' position. Press the Horn Button to initiate 'Valid Engine Data' on the Diagnostic Display. Fig1.
  Wait until the engine data is *fully loaded* then:
- Press and '**hold**' the Start Button until the engine has started. Allow the hydraulic pumps to operate and circulate the oil in the system. Use the Engine RPM Control to set engine speed. (See page 2-01).
- Switch the System Power '**ON**'.
- Fig.2. Press Pad 2 to bring up '**Select Screen'**
- Fig.3. Scroll with Arrows '**A**'-'**B**' to Select '**Warm-Up'**. Press Pad '**C**' - '**OK**', to bring up '**Warm-Up**' screen.
- Press Button '**1**' to put machine in '**Ready**' mode.
- Fig.4. Press Button '**B**' to run the Warm Up System until the normal operating temperature is indicated on the temperature 'read-out' on the Control Panel Screen.

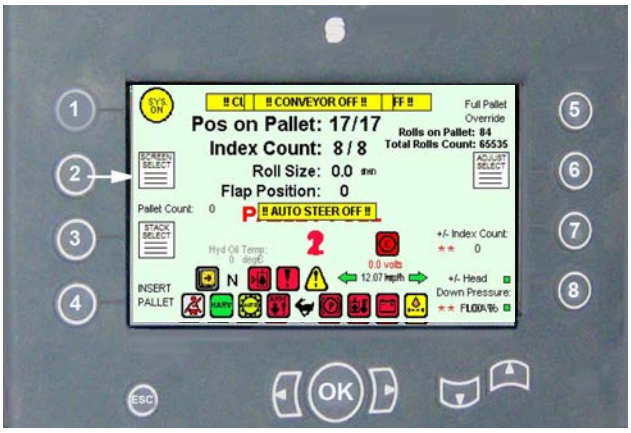


Fig.2

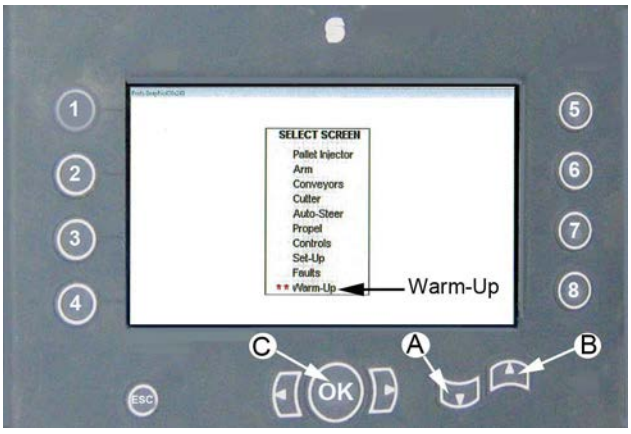


Fig.3

CAUTION

To prevent damage to the Cut–off mechanism the Cut–off ***must only be operated when the machine is harvesting.***

The above procedure will:

- Ensure that the machine will function efficiently, with the hydraulic oil at operating temperature.
- Prevent possible damage to components due to cold hydraulic oil.
- Will indicate that the machine is properly 'set-up' and ready to operate.
- Enable a check to be made for oil leaks.

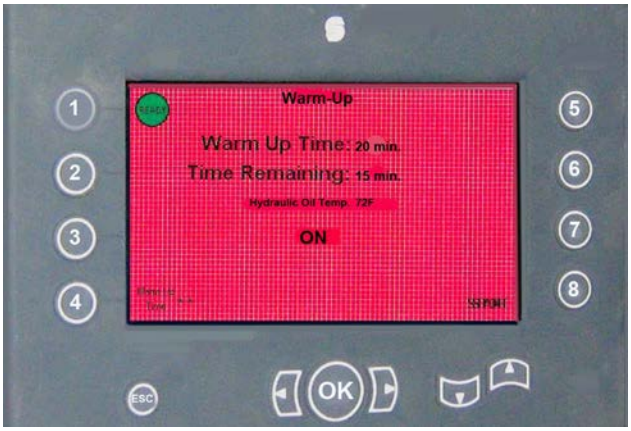


Fig.4

CAUTION

The operator must read the Operator's Manual thoroughly, to familiarize himself with the safe operation of the controls and the machine.

Recommended Harvesting Speed.

With the Control Handle '**A**' in the '**NEUTRAL**' position, and no pressure on the Brake/Inch/Clutch Pedal '**B**':

- Turn Ignition Key **'C'** to the '**ON**' position.
- Press Horn Button – to validate engine data.
  See page 3-06
  Engine will not start if this is not done.
- Press Engine 'Start' Button '**D**' until the engine is running, then release.
  Do not start the engine with system power 'ON'.
- Turn System Power '**ON**'. Switch '**E**'.
- Go to 'Start Up' Screen on Display (See previous page). Follow the warm up procedure.
- Ensure that Switch '**F**' is in '**HARVEST**' mode.
- Using Control '**G**', increase the engine to maximum RPM.
- The following pages show the operating sequences and optimum settings for harvesting.

NOTE

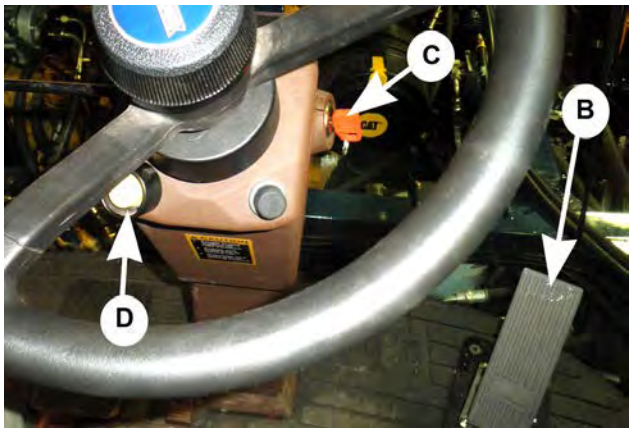
The Control Handle 'A' sets the Ground speed and the direction of travel.

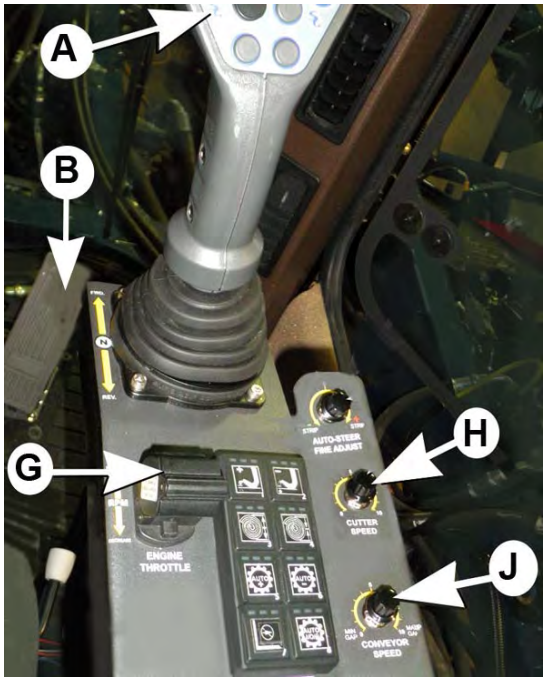
Cutter Blade.
To reduce 'shock loads' to the Cutter Motor, when starting to harvest, the Cutter Blade should be started **before the Cutter Head is lowered to the ground.**

Cutter Blade - Speed Setting 'H'.
Initially, for best results, start cutting at maximum speed and work back to the lowest speed that gives the best results. Lower cutter speed results in less vibration.

The ground speed may have to be reduce when harvesting in rough or stony ground to avoid possible damage to the cutting components.

Main Conveyor Speed 'J'.
The Main Conveyor speed should be adjusted to provide a space of four to six inches between the sod pieces as they travel up the conveyor.
If the Space between the sod pieces is ***less than four inches*** the electronic sensor may not 'detect' the end of the sod piece.





NOTE

It may be necessary to adjust the Main Conveyor speed as the hydraulic oil reaches full operating temperature.

When setting the Main Conveyor Speed, operate in in the engine RPM that will be used when harvesting.

To maintain proper spacing between the sod pieces on the conveyor, keep a constant travel speed.

NOTE

Refer to the Section 2 for the Controls Functions.

CAUTION

Before starting to cut the field, ensure that all by-standers are clear of the area, and that there are no foreign objects or obstacles that may possibly cause an accident.

Start the engine and follow the warm up procedure, see page 3-01.

- On Cab Switch Panel (page 3-07) turn System Power to '**ON**'. This will '**enable**' the harvester functions, except : Travel, Depth of Cut and Cutter Head Position.
- Ensure the Park Brake is switched '**OFF**'. See Switch **'K'** on Switch Panel – page 3-07.
- Increase the engine RPM to the desired speed. (page 3-07).

CAUTION

Do not drive the machine at Low Engine Idle, component damage will occur.

With the Mode Switch in '**Harvest Mode**' (page 3-07), the engine speed is limited to 1800 RPM. (Harvest Speed). In '**Road Mode**' the engine speed is limited to 2200 RPM and allows maximum speed for transport.
For Auto Drive 'increase'/decrease' see the 8-Pad Console Control on page 2-02.

NOTE

The Control Handle must be in the 'NEUTRAL' position to turn the high speed mode 'OFF'.

- Raise the Cutting Head and Conveyor with Button '**B**' on Control Handle. See page 2-02.
- The Control Handle controls the machines direction and ground speed. Increasing the forward direction increases the ground speed. Returned to neutral will stop the machine.
  If the Control Handle does not respond initially, return it to neutral to re-set it.
- The ground speed can be proportionately decreased by pressing the Brake/Clutch/Inch Pedal without moving the Control Handle. Releasing the foot pedal will return the machine to the control handle speed setting.

CAUTION

Fully depressing the foot pedal will '**STOP**' the machine immediately.

If driving the machine prolonged distances or on rough terrain, the Pallet Dispenser should be fully lowered and the Arm supported on the index conveyor with turf rolls under the Gripper Head. (To move the Dispenser and Arm to these positions see 20-Pad Control. Page 2-02).

When stopped and leaving the cab it is recommended that the Cutter Head and the Conveyor are lowered to the ground.

Screen Navigation.

To navigate through the available screens:

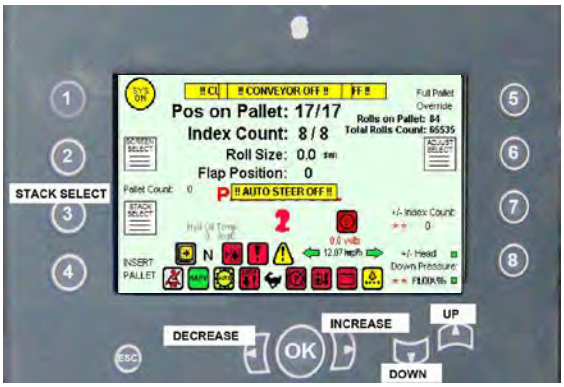
- Select the 'Screen Select' Pop-Up Menu on the Harvest Screen, see page3-05, by pressing Button 2.
- Using the 'UP-Down' Arrow Buttons scroll through the available screens. See below.
- Press the 'OK' Button to go to the selected screen.
- Press the 'ESC' Button to exit a screen, return to 'Harvest Screen' or exit a 'Pop-Up' Menu.

Display Button Functions.

- To scroll 'Up or Down' or to enter sub-screens use the 'UP' or 'Down' buttons.
- To Increase or Decrease a value or setting, use the 'Right' and 'Left' arrows buttons.
- To Exit press 'ESC' button.

Harvesting.

Preparing Machine to Harvest.



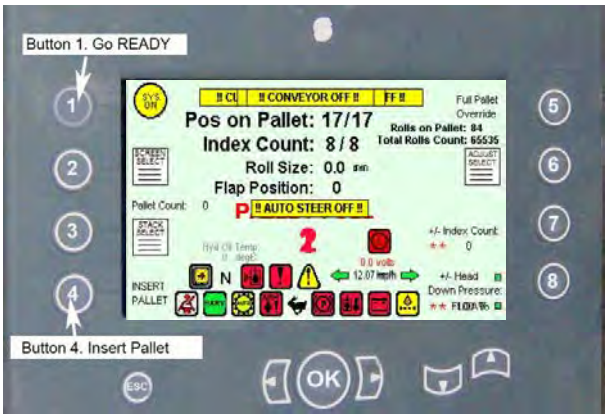
Inserting Pallet onto Forks.

- Place machine into Harvest Mode.
- Position Count on Pallet must be'**0**'.
  To change the count, if not at '**0**' :
  from Harvest Main Screen enter the 'Stack Select' Pop-Up Menu by pressing Button '**3**'.
  Scroll down using '**DOWN**' Arrow Button to Position Count, and adjust to '**0**'. (Or select Empty Pallet. See P3-05).
  Decrease using left Arrow Button.

Cont…P3-09

HARVESTING. …cont

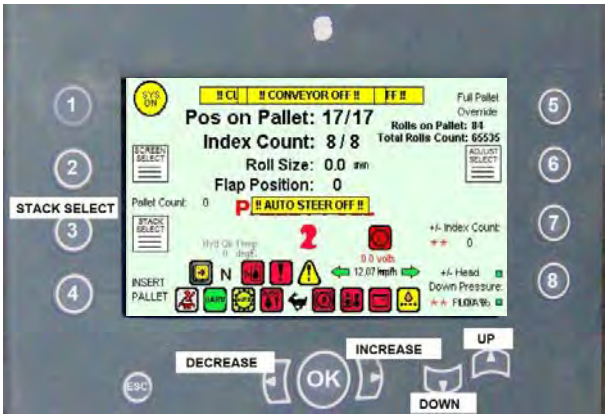
- Machine must be in ‘READY’ state.
  Increase engine RPM, then from the Harvest Screen press display Button ‘**1**’. Machine will now position/move components to their Home/ Ready positions and enter its ’READY’ state.
- Press and hold display Button ‘**4**’, from Harvest Screen, to insert pallet onto Forks. Release Button once sequence has started.

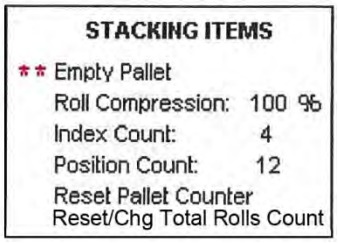


Machine Adjustments.

- Ensure the ‘Position’ and ‘Index Counts’ on the display match the machines current counts.
- To change the ‘Position’ and ‘Index Counts’ enter the ‘**STACK SELECT**’ Pop-Up Menu by pressing Button ‘**3**’.

  Scroll ‘**UP**’ or ‘**DOWN**’ using the ‘**UP**’ –‘**DOWN** arrows buttons, to ‘Position’ or ‘Index Count ‘and adjust to correct value, or press Button 7.
  To **Increase** – press right arrow button.
  Decrease – press left arrow button.





Harvest Initializing.

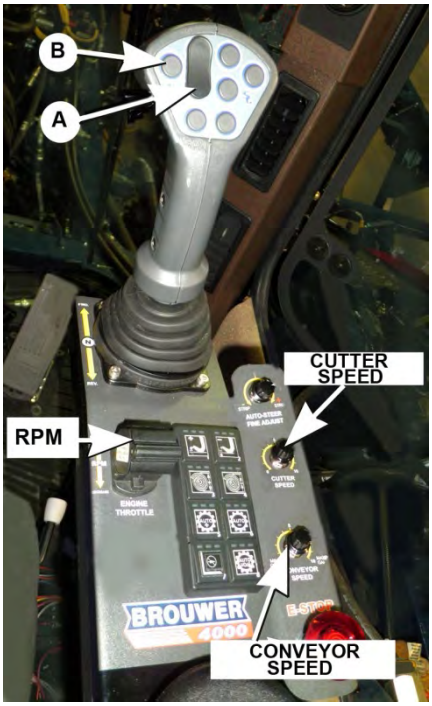
Aligning Machine to Cut Line.

- Lower the Conveyor , Pad ‘**A**’, until the Conveyor ‘**DOWN**’ Position Indicator on the display is ’**ON**’, keeping the Cutter Head off the ground.
- Turn the Auto Steer ‘**ON**’, Button ‘**B**’. When the Auto Steer Ski is adjacent to the Cut Line continue driving forward until the Cutter Head Blade is in the desired position.

NOTE

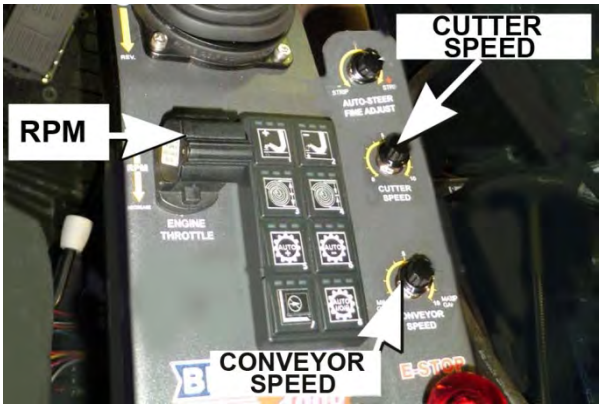
The Auto Steer will not turn ‘**ON**’ if the Conveyor ‘**DOWN**’ position Indicator is ‘**OFF**’.
Press Button ‘**B**’ to toggle the Auto Steer ‘**ON-OFF’**.

Use Pad ‘**A**’ on Control Handle to raise the Conveyor/ Cutter Head.



Harvesting (Auto Mode System 'ON').

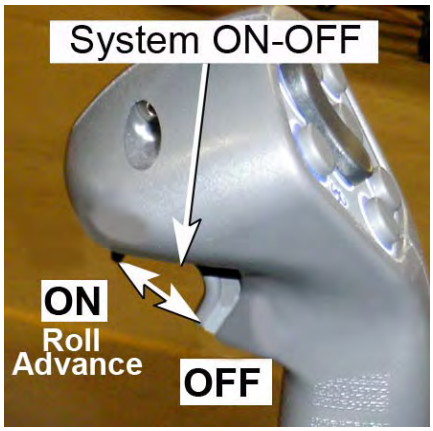
- Set engine RPM to maximum (1800).
  Harvesting must be done at max RPM.
- When in the '**READY**' State, push the Control Handle Trigger Switch '**UP**' and hold until the system is '**ON**' (**Auto Mode**). The cab display will indicate that the system is '**ON**'. The Cutter Head and Conveyor will then start to operate.
- Adjust the Cutter and Conveyor speeds with the control knobs on the Control Panel.
- Lower the Conveyor and the Cutter Head to the ground by pressing and holding Pad '**A**' on Control Handle until the Head Down Pressure Indicator on the display is '**ON**'. (See below).



NOTE

When the Cutter Head is lifted the acquired/measured Cut Length is '**RESET**'.

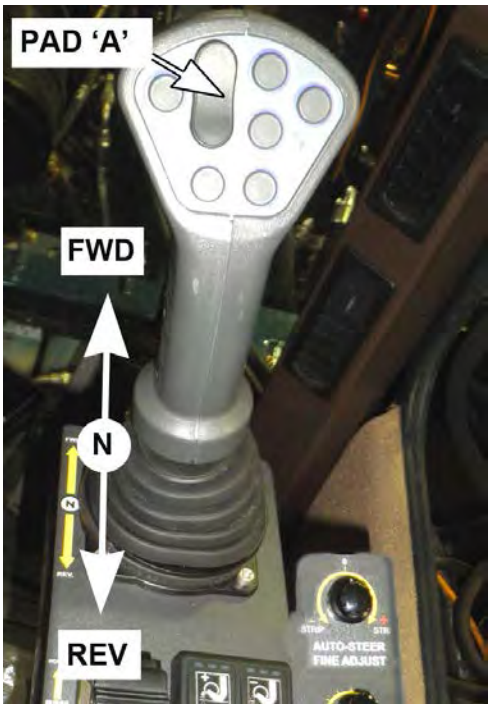
- Move the Control Handle '**FORWARD**' to the desired harvesting speed.



NOTE

Pushing the Control Handle Trigger Switch '**UP**' with the System '**ON**' (Auto Mode), will index the Index Conveyor one position.

- Pulling the Trigger Switch '**DOWN**' will stop the Auto Mode. The System is now '**OFF**' and the Cutter Head and Conveyor will stop.
  The Arm will also stop regardless of its position so, if possible, turn the System '**OFF**' when the Arm is over the Index Conveyor *(machine counts stacked position when the Arm Returns 'HOME')* at its Home position.



NOTE

Turning the System '**OFF**' will not stop the machine from driving, so it is recommended, if possible, to '**STOP**' the machine first, and process any turf on the conveyor before turning the System '**OFF**'.

To return to Harvesting – if the System is turned 'OFF'.

- Set engine at Max RPM. (1800 RPM).
- Return to '**READY**' State with Display Button '**1**'.(page 3-12).
- Push Trigger Switch '**UP** and hold until System is '**ON**'.
- Press and hold Control Handle Pad '**A**' until the Head Down Pressure Indicator on the Display is '**ON**'. Do not Lift Cutting Head, as it will reset the saved cut length, unless machine repositioning is required.
- Move the Control Handle '**FORWARD**' to the desired harvesting ground speed.

Harvesting Adjustments.

Initially it is recommended to cut a few rolls of turf and then make the following adjustments:

- Stop the machines travel. Stop the Cutter Head with Control Handle Button '**G**', and if required stop the Conveyor - Button '**F**'.
  (**Some, if not all adjustments, may require more harvesting before adjustments can be made).
- Fig.3.Cut Depth : **Increase**- Pad 2.**Decrease**–Pad 1.
- Fig.3.Roll Dia.: **Increase** – Pad 4. **Decrease**–Pad 3.
- Fig.2.Flap Position: **Increase/Up** – Button '**C**'. **Decrease/Down** – Button '**E**'.
- ** Head 'DOWN' Pressure – Display Button'**8**' then Right Arrow to Increase and Left Arrow to Decrease.
- Cut Length, ** Index Conveyor Advance Count, **Bad Roll Flap Correction, and ** Bad Roll Open Time ; are in the 'Adjustments' Pop-Up Menu, by pressing Display Button'**6**'. Fig.1. (see page 3-13), Scroll by using the display 'UP/DOWN' arrow Buttons, Right to **Increase**, Left to **Decrease**.

It is recommended that a 4 to 6 inches gap is left between the slabs on the conveyor.

Fig.1 **Cab Display. Controller 'A'.**

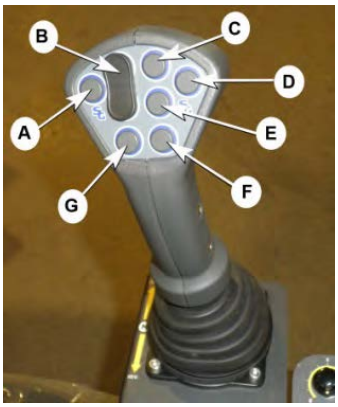


Fig.2. **Control Handle.**

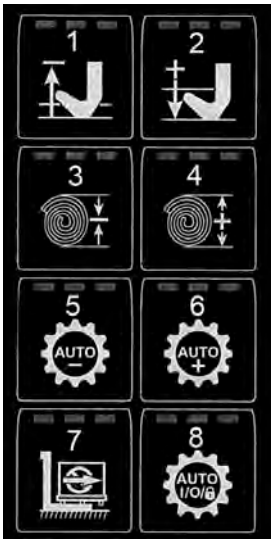


Fig.3. **Console 8-Pad Control.**

Other Harvesting Features.

Pallet Unload 'HOLD' Mode:

- While in the Harvesting Mode: Pressing the 8-Pad Control - Pad '**7**' will prevent a Full/Complete Pallet to be unloaded, and a new pallet to be inserted onto the forks.
  Indicated on the Display when symbol is '**ON**' **solid**.

Feature is used when the operator cannot unload Full Pallets 'In-Line' behind the harvester and has to unload the pallets clear of the Harvest/Cut-line. i.e. when reversing out.

When in this mode and the symbol is indicated '**ON**' solid:

- Complete the Pallet. (Full Pallet).
- Stop travel, with System '**ON**'- Auto Mode.(Machine will automatically '**STOP**'. Reset the Control Handle to '**NEUTRAL**' to regain control.
- Lift the Cutter Head/Conveyor with Button '**B**' on Control Handle (the Auto Steer will turn '**OFF**' automatically. It can also be turned off with Button '**A**' on Control Handle.
- The Cutter Head will turn 'OFF' automatically. (Control Handle Button '**G**' will also turn it off). If desired Turn Conveyor '**OFF**' with Button '**F**'.
- Drive machine to unloading position. Stop if 'Stop to Unload' mode is '**ON**'. (See Pallet Injector section).
- Press 8-Pad Control - Pad '**7**', to release the Full Pallet Hold. The Full Pallet will unload to the ground.
- 'Drive the machine forward to insert new pallet onto the forks.

NOTE

The Pallet Dispenser Box will not return to its Home position until there is one position on the pallet.

The operator can hold each pallet with Pad '**7**' while harvesting each pallet, or can enable the machine to automatically hold every pallet. To do this:

- Press and 'HOLD' Pad '**7**' until the Display symbol flashes, this indicates the Pallet 'HOLD' feature is '**Pending**'.
- When the symbol is '**ON**' (solid) the pallet will be held until release to 'unload' by pressing Pad '7'.
- To turn this mode '**OFF**' press and 'HOLD' Pad '**7**'.

OPERATION

Auto Drive System.

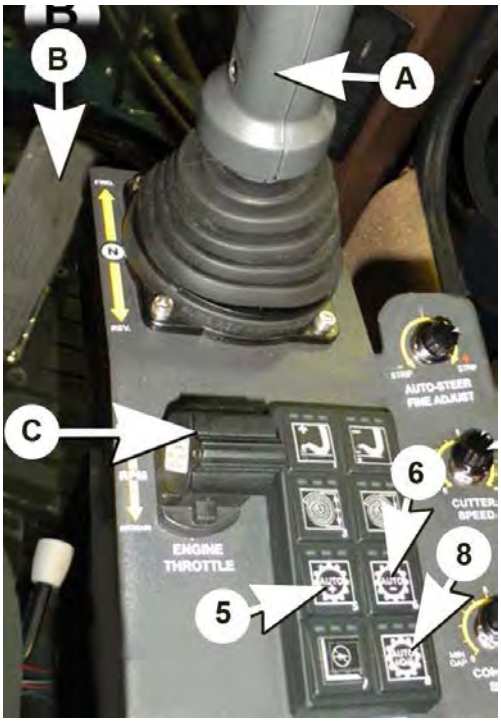
Two advantages to using this feature are:

- Machine will return to last Saved/Set Harvest Ground Speed.
- Machine will maintain Saved/Set Harvest Ground Speed which would normally vary on grades in the field.

To Set/Save/Change Auto Drive Ground Speed:

- While in harvest (System ON/Auto Mode), at the desired ground speed, press and Hold Pad '**8**',(on 8-pad control). The system will save the current ground speed and turn the Auto Drive '**ON**'. (Indicated on Display).
- To **increase** speed ,with Auto Drive '**ON**' press Pad '**6**'.
- To **decrease** speed press Pad '**5**'. After changing speed the system will save the new Auto Drive speed setting.

- To turn the Auto Drive '**OFF**', pull the Control Handle '**A**' '**BACK**', or press **Pad '8'**.
- To resume to the last Saved/Set speed, move the Control Handle to approximately the same speed and press **Pad '8'**. If Auto Drive has not turned on automatically it will now be '**ON**'.
- Auto Drive will remain enabled but will not maintain ground speed if the **RPM** Control '**C**' is not at **100%,** or if the Foot Pedal '**B**' is pressed.



Control Console.

Operation and Harvesting Modes(per Screen).

Harvest Main Screen.

- Button '**1**' will send the machine main components to their Home/Ready positions and enter its '**READY**' state.
- Button '**2**' opens '**Select Screen'** Pop-Up Menu - to navigate to required screens.
- Button '**3**' opens '**Stacking Items'** Pop-Up Menu to adjust the following actions :

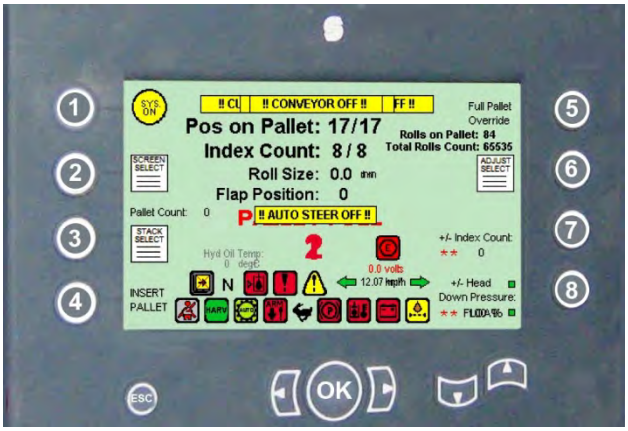
Empty Pallet: Pressing and holding the '**OK**' Button will reset the positions on the pallet to '**0**'.
Roll Compression: Adjusting from '**0**' to **100%** - determines how much the Arm compresses the rolls on the pallet , per layer, while stacking. Increasing from **0 %** (1st layer) to setting **%** (last layer), incrementally.
Index Count: Adjustment of Rolls on Index Conveyor.
Position Count: Adjustment of Positions on Pallet.
Reset Pallet Counter: Press and Hold the '**OK**' Button to reset the current Pallet Count on the Display.

- Button '**4**' – Press and hold to insert a Pallet onto the forks.

NOTE

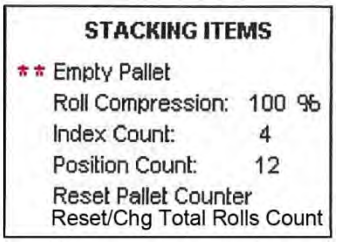
Machine has to be in '**READY**' State with Positions on Pallet at '**0**' (empty).

- Button '**5**' - only enabled when the Arm is at '**Home**' position above Index Conveyor with the System '**ON**' (Auto Mode). Pressing and Holding Button '**5**' completes the Pallet to its maximum positions and is considered '**FULL**'.



Harvest Main Screen

Button 2.,



Button 3.

cont….

…cont

- Button'**6**' opens 'Adjustments' Pop-Up Menu with these options:

Index Advance Count: Adjust the value as the Index Conveyor Indexes in comparison to the Flap Position Value.

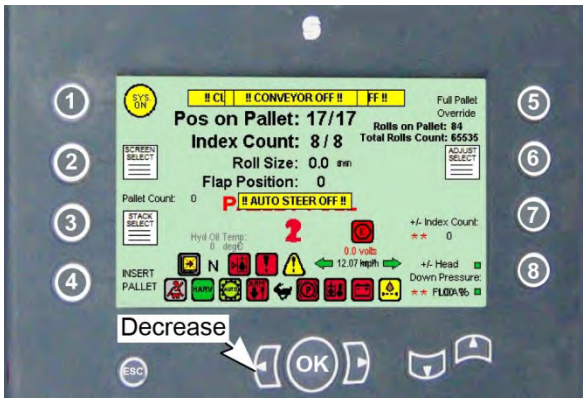
Bad Roll Flap Correction: Value to Skew the Flap Position of the First Roll after a Bad Roll Ejection. The lower the value , the lower the Flap Position.

Bad Roll Open Time: 5 to 95%. The percent of time the Bad Roll Section of the Index Conveyor remains '**Open**', before it closes to catch the first roll after a Bad Roll Ejection.

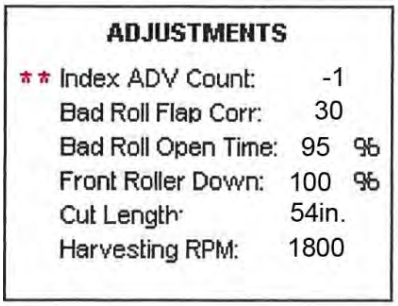
Front Roller Down %: The percent the Front (Conveyor) Roller Pressure is above the Cutter Head Roller Down Pressure.

Cut Length: Adjustment of the Ground Cut Length.

Harvesting RPM: The maximum value the Engine Speed will reach in Harvest Mode. Recommended – 1800RPM.



Main Harvesting Screen



Button 6.

Button **'7'.** Enables the adjustment of the current number of rolls on Index Conveyor . Range is 0 to 8.

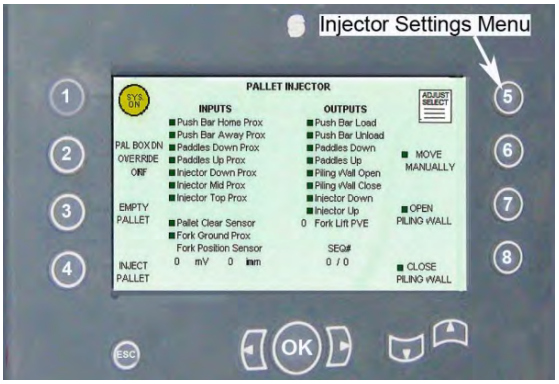
NOTE

At eight Rolls in Auto Mode, the Arm will pick up the rolls on the Index Conveyor and stack them on the pallet.

Button '**8**'. Enables the adjustment of the Cutter Head Roller Down Pressure Range. 0 to 100%, pressing and holding the Left Arrow Button (decrease) while at 0% will switch the Down Pressure Mode to '**FLOAT**'.

Pallet Injector Screen.

- Button '**1**' will send the machines components to their Home/Ready positions and enter its '**Ready**' state.
- Button '**2**' turns the 'Pallet Box Down Override' **ON** and **OFF**. Typically used if the machine is 'Stopped' after unloading a full pallet with the full pallet below the Pallet Dispenser Box. When '**ON**' the pallet box will not go down to its fully '**Down**' and '**Ready/Home'** position until one position is placed on new pallet.
- Button '**3**' will Empty/Clear the current position count on the pallet and set it to '**0**'. This allows the operator to Empty the pallet, go to the 'Ready State', and inject a New Pallet in this Screen - Button'**4**'.



Pallet Injector Screen

Note

Typically a '**Green**' Box indicates that an Input is '**ON**'. '**Red**' = '**OFF**'.

cont…

cont.

Pallet Injector Screen.

- Button '**5**' will open the 'Pallet Injector Settings' Pop-Up Menu with the available options:

Stop to Unload: '**ON**' or '**OFF**'.

- '**ON**' - the machine has to be Stopped to Unload a Full Pallet.
- '**OFF**' – The machine can be moving to unload a Full Pallet.

Unload Ground Speed Control: 'ON' or **'OFF'.**

- **'ON'** – the machine will automatically slow down to the 'Unload Ground Speed' %, or automatically Stop if '**Stop to Unload'** is '**ON**' or 'Unload Ground Speed' % is '0%'
- '**OFF**' –the machine will not automatically override the ground speed to unload a full pallet. The operator has control of the ground speed or stopping to unload.

Inject Fork Height:

- Position of Forks when injecting a new Pallet. (While Harvesting).

Pallet Lift: 'ON' or **'OFF'.**

- '**ON**' – Paddles in Dispenser will lift the stack of pallets above the bottom one when inserting a new pallet.
- **'OFF' –** Paddles in Dispenser will not lift the stack of Pallets above the bottom one when injecting a new pallet.

Tender Turf Mode:' ON' or **'OFF':**

- **'ON' –** When the Unload Ground Speed control is '**ON**', the Conveyor will slow down at the same percentage as the Unload Ground Speed is set at when unloading a full pallet.
  'OFF': - The Conveyor will not slow down when unloading a full pallet.

Insert Fork Height: Positions of Forks when injecting pallet Manually. (Not Harvesting). See page 3-08.

Pallet Injector:

- **'ON' –** Machine will insert a new pallet, after unloading a full pallet.
- '**OFF**' – Machine will unload the full pallet but will not insert a new pallet.(i.e. if using palletless forks).

Button '6. Allows the operator to move the Pallet Dispenser Function, Forks, and some of the Arm functions manually using the 20-Pad Cab Control.

Button '7'. Manually Opens the Piling Wall.

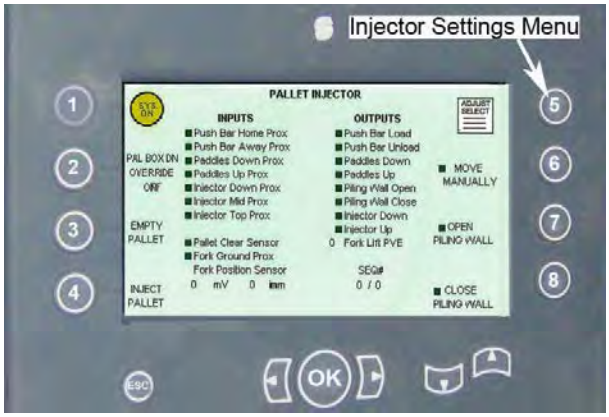
Button '8'. Manually Closes the Piling wall.

Arm Screen.

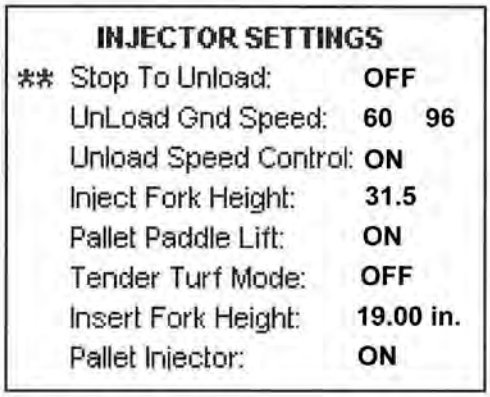
Button '1'. Will send the machines components to their Home/ Ready positions and enter its '**READY**' state.

Button '4'. Opens 'Arm Calibration' Screen. N/A with System '**ON**'.

Button '8'. Allows the operator to move the Arm Functions, Forks, and some of the Pallet Dispenser Functions manually with the 20 Pad Cab Control.



Pallet Injector Screen



Injector Settings

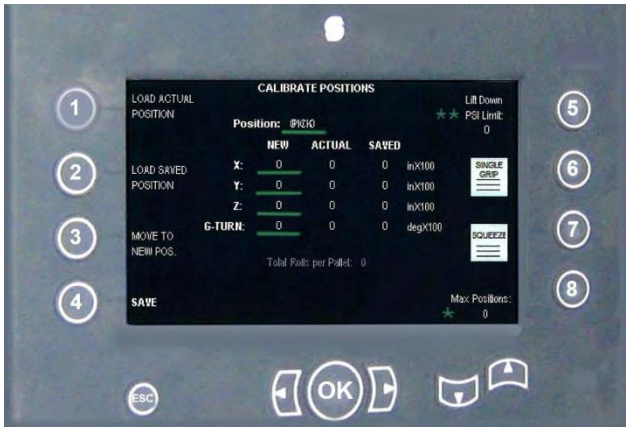
Arm Screen

Arm Calibration Screen.

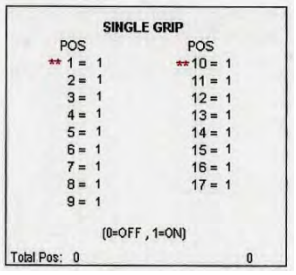
NOTE

While in this screen the operator can move the Arm Functions, Forks, and some of the Pallet Dispenser Functions manually with the Cab 20-pad control. (See page 3-14).

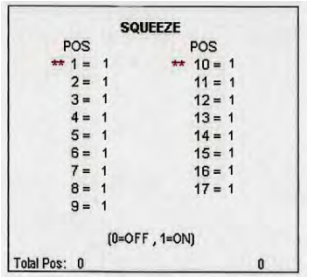
- With the '**Position**' Selected (selected item highlighted with green underline) use the Right and Left Arrow buttons to select the position to modify.
- The 'Up' and 'Down' Arrows select which Position or Co-ordinate to modify e.g. '**X**'
- **Button '1'.** Loads the Arm's actual position into the new Co-ordinates.
- **Button '2'.** Loads the Arm's saved Co-ordinates into the New Position.
- **Button '3'.** Moves the Arm to the New or Saved Co-ordinates, whichever is last loaded into the New Position.
- **Button '4'.** Saves the New Position value whichever was last loaded into New Position.
- **Button '5'.** Enables the adjustment of the Maximum Arm Down Pressure Limit while stacking on the current pallet configuration.
- **Button '6'.** Opens the 'Single Grip' Pop-Up which allows the operator to select when the Arm picks up 4 or 5 rolls to be stacked on the current pallet configuration.
- **Button '7'.** Opens the 'Squeeze' Pop-Up which allows the operator to select which positions are to be 'Squeezed' on the pallet.
- **Button '8'**. Enables the adjustment of the Maximum Positions allowed on the current pallet configuration.



Arm Calibration Screen



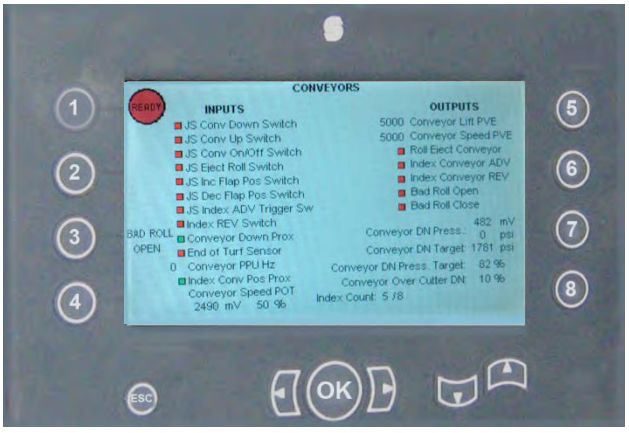
Single Grip Menu



Squeeze Menu

Conveyors Screen.

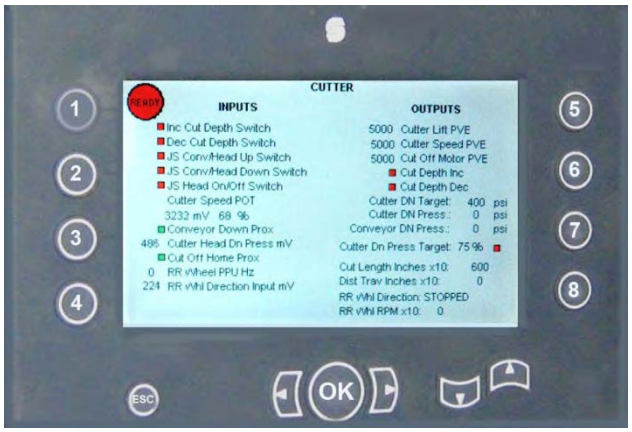
- **Button '1'.** Will send the machines components to their Home/Ready positions and enter its 'Ready' state.
- **Button '3'.** Will manually '**Open**' the Bad Roll Section of the index Conveyor. Only available when the System is '**OFF**'.(Auto Mode '**OFF**'). Will '**Close**' when machine returns to 'Ready' state.



Conveyors Screen

Cutter Screen.

- **Button '1'.** Will send the machine's components to their Home/Ready positions and enter its 'Ready' state.

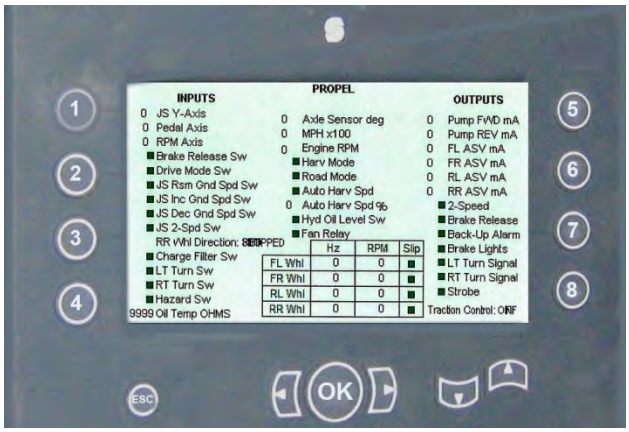


Cutter Screen.

Propel Screen.

- **Button'8'.** Press and Hold to turn the Traction Control **'ON'** or '**OFF**'.

NOTE
Traction control is 'OFF' in 'Road' Mode.



Propel Screen.

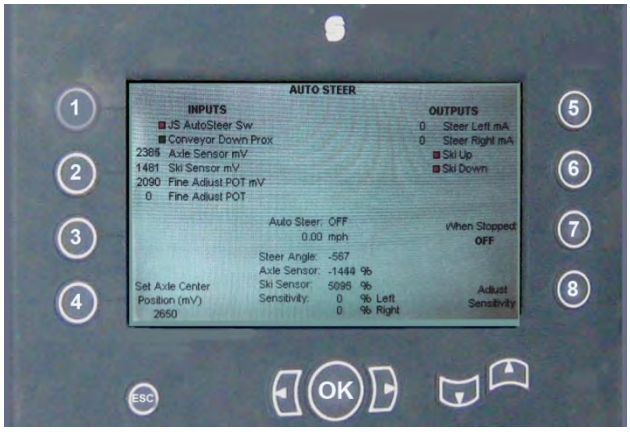
Auto-Steer Screen.

- **Button '4'.** Allows the operator to adjust the 'centre' position of the front axle.
- **Button '7'.** Allows the operator to turn the Auto **Steer 'ON'** or '**OFF**' while the machine is '**Stopped**'.
- **Button '8'.** Enables the adjustment of the Auto Steer 'Left' and 'Right' Sensitivity '%'. Pressing Button '8' toggles between the Left and Right adjustments.

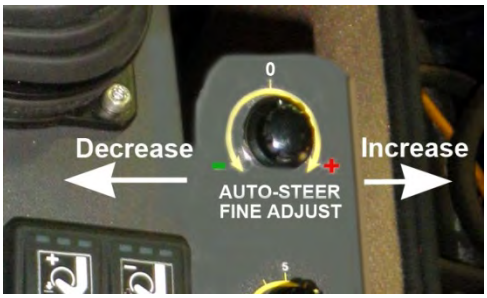
When highlighted, adjustments are done with the Left and Right Arrows Buttons. Adjusting these values with the Fine Adjust Control at the Neutral Position is recommended.

i. **Increased – Higher** numbers allow the Front Wheels to turn more in that direction.

ii. **Decreased – Lower** numbers restrict the Front Wheels Turning in that direction



Auto-Steer Screen.



Auto-Steer Fine Adjust Control.

Set-Up Screen.

- **Button '2'.** Allows the operator to Select the Current Pallet Configuration by using the Left and Right Arrow buttons. Selection only allowed when the current Positions on the Pallet are '**0**'.
- **Button '3'.** Selects the Units displayed. Imperial or Metric.
- **Button '4'.** Opens the Warm Up Screen.
- **Button '5'.** Key- backlight adjustment.
- **Button '6'.** Press and Hold to Toggle between Service/ Shipping Mode **- 'ON'** or **'OFF'.**

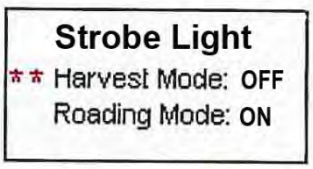
Set –Up Screen

Service/Shipping Mode:

I. **Must be 'ON'.** When disconnecting any sensors for service or machine shipping purposes.

II. **'OFF'** Default. Normal operations. If '**OFF**' and machine **system power is** '**ON**', if there are any sensors disconnected they will '**Fault**' and Lose Calibration Values, **and will require recalibration .**

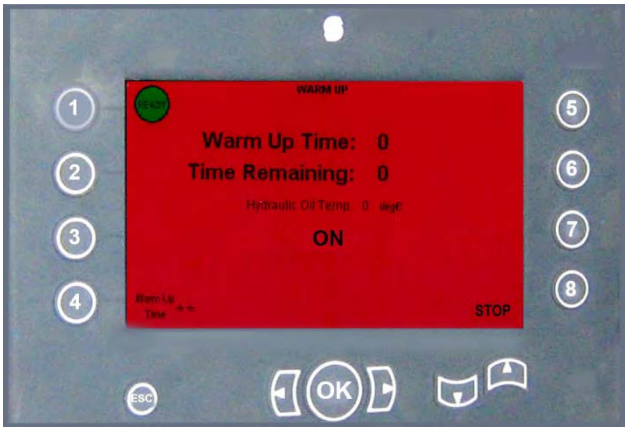
- **Button '7'.** Opens the Strobe Light Menu which allows the operator to have the Strobe Lights 'ON' or 'OFF' during Harvest and Transport Modes.
- **Button '8'.** Enables the adjustment of Display Screen Brightness –'0' to '100%'. Pressing and holding the Right Arrow Button will switch the Brightness Control to Auto Mode.



Strobe Light Menu

Warm-Up Screen.

- **Button '1'.** Will send the machines components to their Home/Ready positions and enter its 'Ready' state.
- **Button '4'.** Enables the adjustment of the Warm Up time.
- **Button '8'.** Press and Hold to turn the Warm Up Function **'ON'** or **'OFF'.**



Warm –Up Screen

Fault Screens.

There are two Fault Screens.

Page 1 of 2 Displays the Fault Status of the machines Inputs and CAN Buses

.

Page 2 of 2 Displays the Fault Status of the machines Outputs.

- Green Box = OK Status
- Red Box = Fault Active Status.
- Not Cal. = Component Not calibrated.

Faults Screen. 1of 2

Faults Screen. 2of 2

Sod End Sensor – Calibration.

Field Installation.

Fig.1

'A' – Sensitivity Range Adjustment.
CW = Increase sensitivity.
CCW = Decrease sensitivity.

'B' – LED 'GREEN'. Power 'ON'.

'C' – LED 'YELLOW'. Target 'In Range'.
This must be 'ON' only when sod is passing under the Sensor.

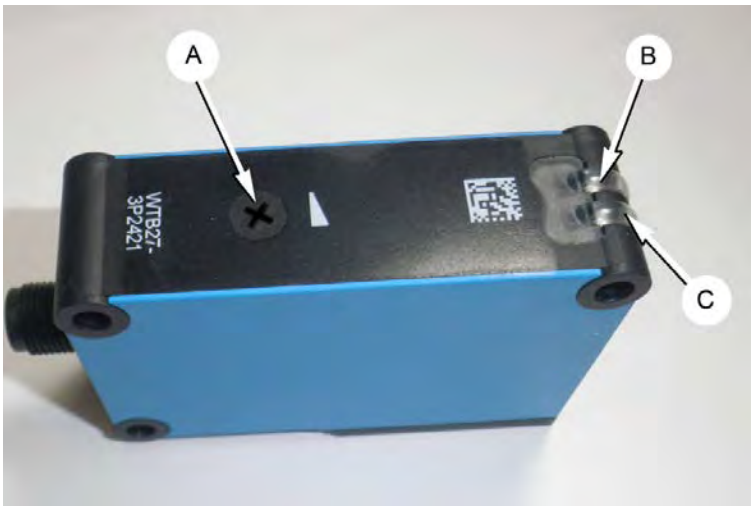


FIG.1

FIG.2

Range adjustment may be required when a new Sensor is installed, or to allow for any change in sod thickness, particularly if the sod being cut is very thin.

- Place a piece of 3/16 in. thick cardboard under the Sensor to act as a target.
- Switch system power (harvesting mode),'ON'. The 'GREEN' LED should light-up.
- The 'YELLOW' LED will light-up when the Target is detected.
- Remove the Target. The 'YELLOW' LED should not be 'ON'.
  If the LED remains 'ON', carefully turn the Range Adjuster CCW until the LED does not light-up.

IMPORTANT

If, while the conveyor mat is running with no sod on it, the 'YELLOW' LED **remains 'ON'** or 'flickers '**ON-OFF**', **reduce** the sensitivity until the LED remains '**OFF**'.

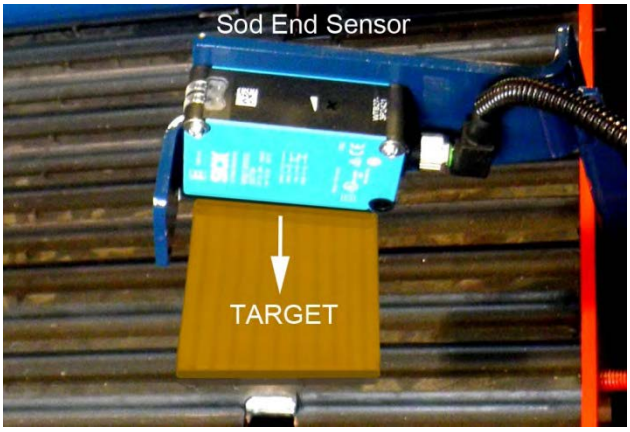
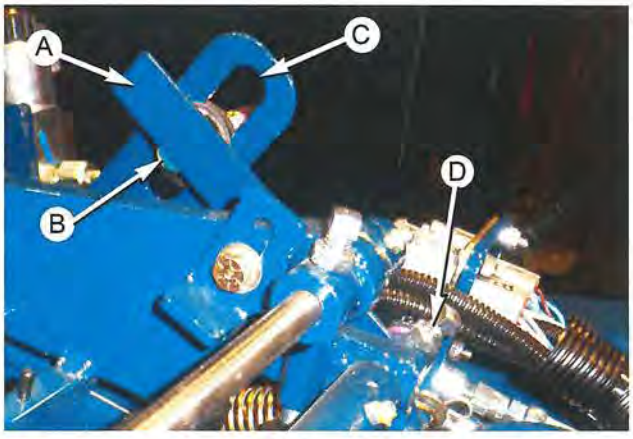


FIG.2

IMPORTANT

To ensure optimum performance the Sensors External Lens, (facing the target), should be cleaned regularly. Also check the cable connection and sensor body attaching screws for tightness.(Do not exceed 1.3Nm).

Sod End Sensor – Mechanical Type. (PROX Sensor).



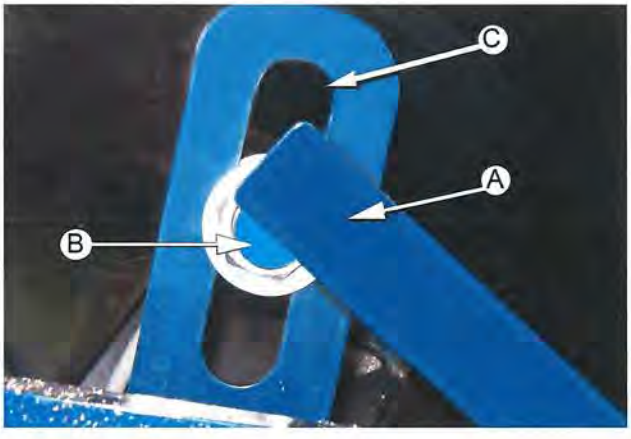
Before the leading edge of the sod has reached the Starter Gate the roll '**END**' sequence 'Starts' with the Sensor Flag '**A**' positioned in front of the Sensor '**B**'.
See adjustment procedure below.

As the sod passes into the Starter Gate the Sensor Flag '**A**' will rotate '**UP**' clear of the Sensor '**B**'.
When the trailing edge of the sod has passed the Starter Gate the Sensor Flag '**A**' will rotate back across the face of the Sensor '**B**'.

CAUTION

Do not carry out any adjustment procedure while the engine is running.

Sensor and Sensor Flag Setting.



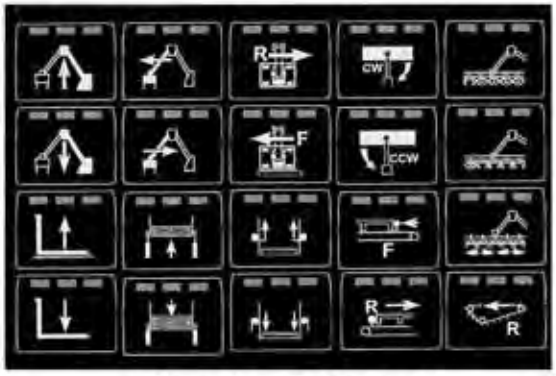
- Position the Sensor '**B**' in the center of the Slot '**C**'. Do not fully tighten the locknuts.
- Loosen the Set Screw '**D**' in the Sensor Flag boss and position the Sensor Flag half way across the face of the Sensor '**B**'. Tighten the Set Screw '**D**'.
- Adjust the locknuts on the sensor until the face of the sensor is 2 to 8mm from the sensor flag. Tighten the locknuts.

NOTE: Pages 19, 20 and 21 are used when training operator.

4000 Setting Positions
(example: PICK)

1. Go to the "Arm" Screen and press the "Calibrate Positions" button 4.

2. Calibration Screen.
   a. While in this screen the operator can move the arm functions with the Cab 20 Pad Control.
   b. Position the arm where you want to save the current position, PICK, i.e. on top of the rolls on the index conveyor.
   c. Ensure if changing the Z position the correct roll size is entered. (the machine will take this into calculating the correct position)
   d. The Up and Down arrow screen buttons move the green selection bar to the desired item to modify. The Left arrow decreases the value and the Right arrow increases the value selected.
   e. With the arm in its desired location (in this case the PICK position);
      i. With the section bar at the Position to select, increase or decrease to scroll until the PICK position is displayed.



20 Pad Cab Control.

ii. Now scroll down to the coordinate you wish to change, in this case the Y Position and press the "LOAD ACTUAL POSITION" button 1.

iii. With the Actual Position loaded under the NEW column, press the "SAVE" button 4 (the NEW value will now be loaded under the SAVED column).

You can also modify the selected "NEW" coordinate using the Left and Right arrow buttons. Refer to the Arm Position Coordinate Chart for the Axis descriptions.

iv. To verify the new saved position is correct. Move the arm, manually with the **Key Pad**, slightly away from its current position. Press the "LOAD SAVED POSITION" button 2. Then press and hold the "MOVE TO NEW POS." button 3. The arm should return to the currently loaded saved position under the NEW column.

v. **Note: When moving to a new position with the screen button use caution because the arm will move directly to the position and will crash into whatever is in its path. So position the arm close to the new target with no obstructions in its path.**

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Pallet Weight Indicator – Option

The correct truck/trailer weight is necessary when the unit is passing through highway weight checking stations.

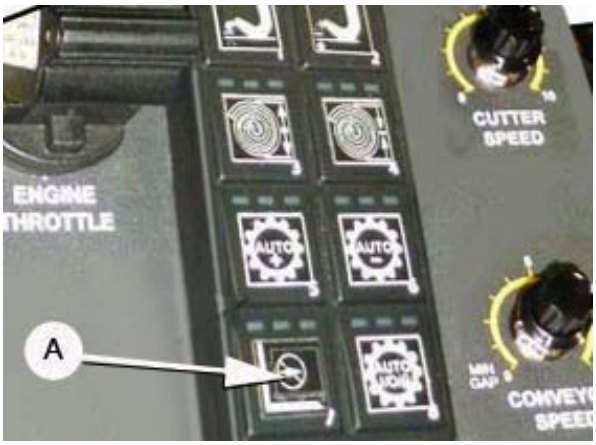
The Pallet Weight Indicator system shows the operator the weight of sod on each pallet.
The pallet weight is shown on the cab display screens.
The operator can then record the pallet weights.

To initiate the system :

- Press the Pallet Hold Pad '**A**' on the console control to enable the Pallet Weight feature.

Note

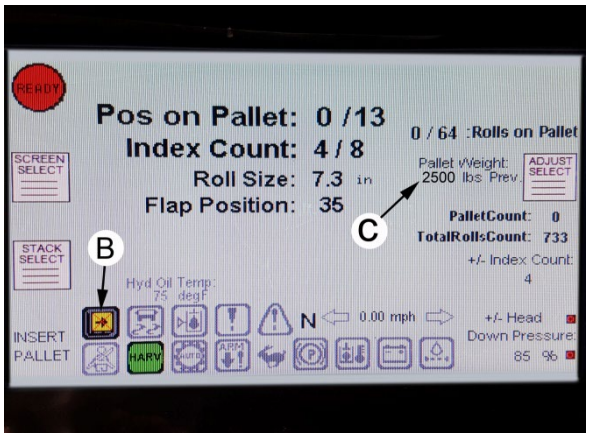
Will only weigh the pallet when '**HOLD**' is '**ON**' and the pallet is full.



Control Console

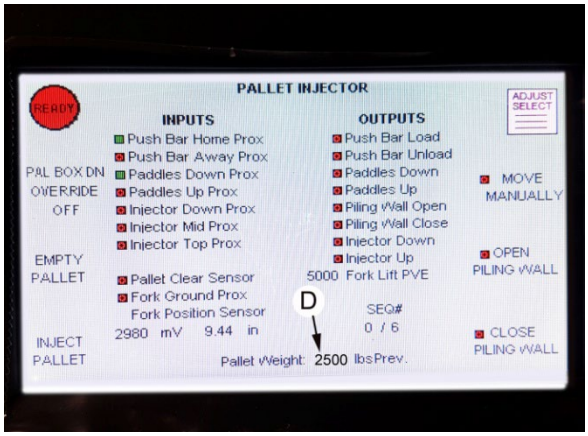
- The Main Screen will indicate that the Pallet '**HOLD**' Icon '**B**' is '**ON**'.

- The weight of the Pallet will be shown at '**C**' on the Main Screen.



Main Screen

- The Pallet Injector Screen also shows the pallet weight at '**D**'.



Pallet Injector Screen

Release the Pallet '**HOLD**' pad and continue to harvest the the pallets of sod until the total weight of pallets required have been cut.

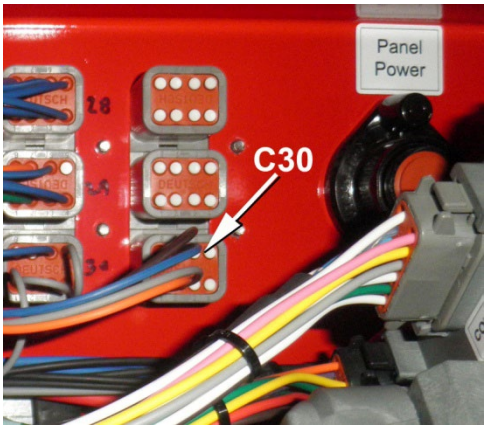
IMPORTANT

While every effort is made to ensure accurate weight figures some variation may occur. The operator should allow for 5% in the total weight of the trailer load.

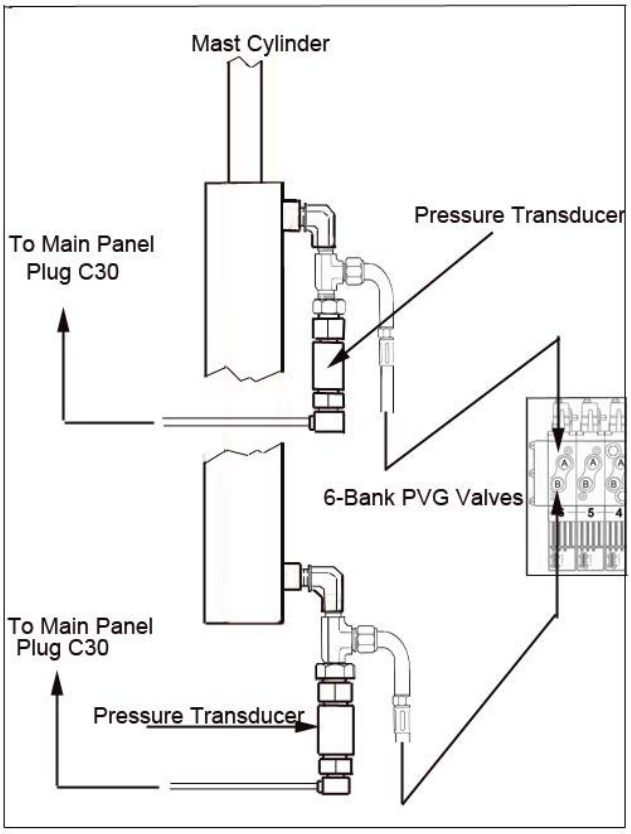
Pallet Weight Indicator – Option

When the Pallet Weight Indicator Option is installed it requires that Pressure Transducers are fitted as shown below

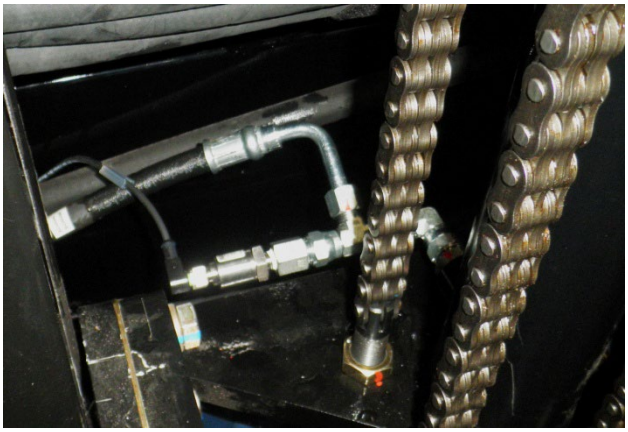
The Pressure Transducers are wired to the Main Panel as shown.



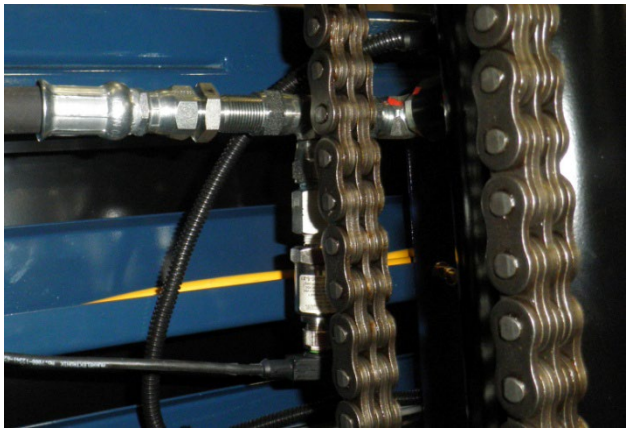
Plug C30. In Main Panel.



Pressure Transducers on Mast Cylinder



Lower Transducer



Upper Transducer

SECTION 4

NOTE

Euro Specification Only:

Hydraulic System.

The Hydraulic System is filled at the factory with **PETRO-CAN HYDREX XV - All Season Hydraulic Oil**, a premium performance, long life, anti–wear hydraulic fluid.

The Hydraulic Oil Tank contains approximately 120 gallons (imp) of hydraulic oil.

IMPORTANT

Use only recommended oils. Failure to do so will result in damage to the hydraulic system
If **HYDREX XV** is not available, some compatible oils are shown in the list opposite.

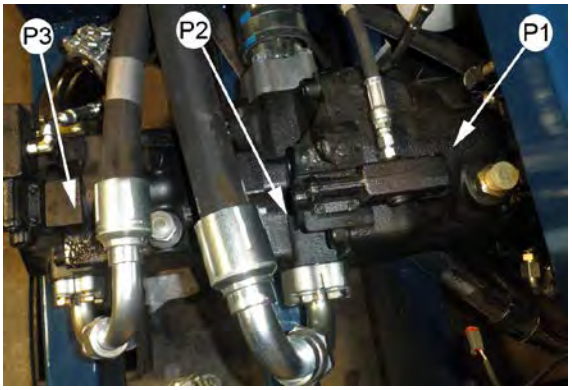
Compatible hydraulic oils

Conoco Phillips ECOTERRA HV146.
This oil is highly recommended

These oils are also recommended.

	Ambient temperature 0^{o} F.to 90^{0} F. -18^{o} C to 32^{o} C.	20^{o} F to120^{o} F. -6^{o} C. to 49^{o} C.
AMSOIL	HV1 46	HVJ 68
MOBIL/ESSO	UNIVIS N46	UNIVIS N68

The Hydraulic Pumps: '**P1**'-Drive, '**P2**'-Conveyor/Pallet, and '**P3**' – Arm, are engine driven.

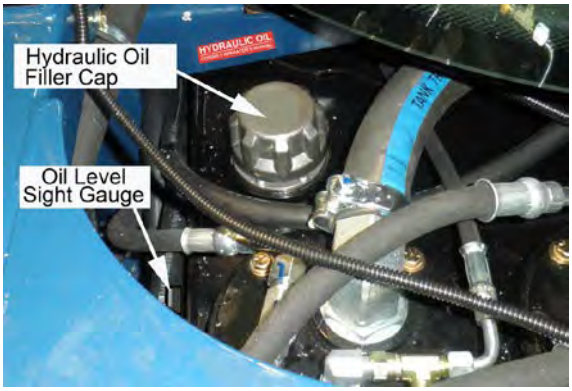


The Pump '**P1**' supplies oil to the Drive Motors via the Anti- Slip Valves. See Hydraulic Schematics. See P4-08
See P4-04 for pressure check/adjust of Drive Pump.

Pump '**P2**' sends oil to the 8 and 6 Bank Control Valves. See Hydraulic Schematics. See P4-06/07

Pump '**P3**'. Sends oil to the 7-Bank Control Valves for the Arm. See Hydraulics Schematics. See P4-09.

Two sets of In-line Filters a Spin-On Filter for the Arm and a Charge Pressure Filter on Pump '**P1**', ensure the hydraulic oil is kept free of contaminants.
See service procedures on pages 4-02.

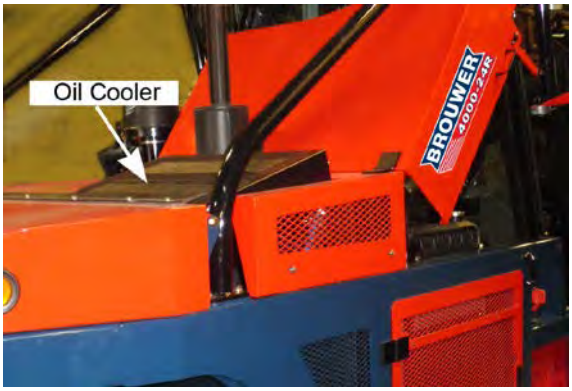


See P4-15 - for rear oil tank filler access.

IMPORTANT

In addition to the oil level 'Sight Gauge' a float will detect low oil level, a warning will 'flash' on the cab display and a 'buzzer' will sound. **Stop operation immediately and investigate for oil leaks.**

Refer to Section six, page 6-13, for oil change schedule.
The Oil Cooler Fan engages automatically when the oil reaches a preset temperature, sensed by a sending unit in the oil tank. Oil temperature is shown on the Cab Display - Controller '**A**'. The Fan reverses periodically to blow debris off the Cooler.



IMPORTANT

To prevent serious damage to the Hydraulic System do not allow water, dirt, or contaminants to enter the system, particularly if working on the hydraulic tank.
When working on/repairing hydraulic components thoroughly clean around the area to be worked on.
Cap and plug all broken connections.

NOTE

To empty the Hydraulic Oil Tank it is recommended that a suction pump is used to remove the oil through the filler opening. Completely drain the tank by removing the magnetic drain plug.

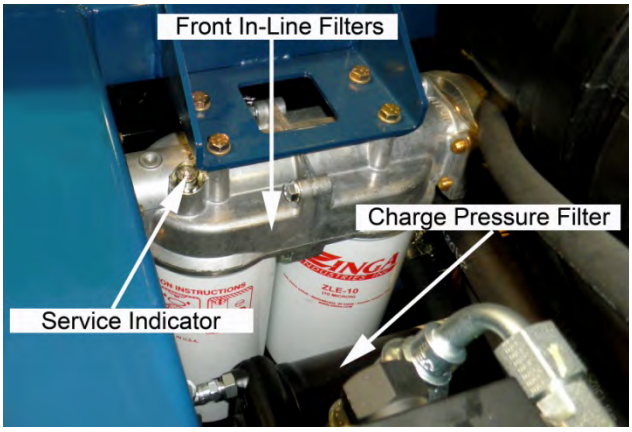
Inline Filters.

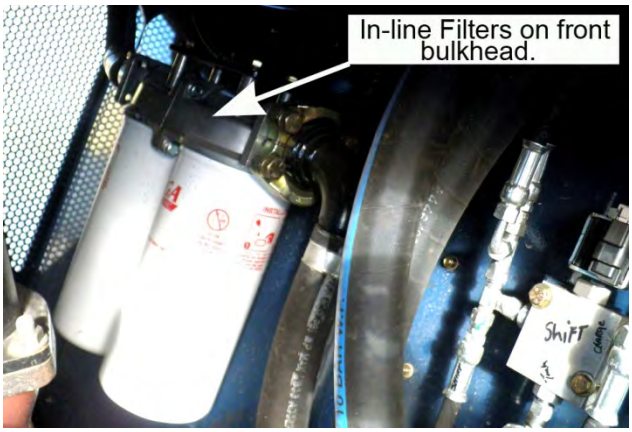
Inline Filters are located to the rear of the Hydraulic Pumps, and also on the front bulkhead.
The filters have a Service Indicator that 'pops-up' when the filters need replacing. **It is important that the operator checks the indicator at regular intervals.**

The service instructions are shown on the filter.
Replace all oil lost during filter change.

IMPORTANT

Keep the Service Indicator area clean so that it is visible to the operator.
Dispose of used hydraulic oil properly . ***Do not re-use*** hydraulic oil.





NOTE

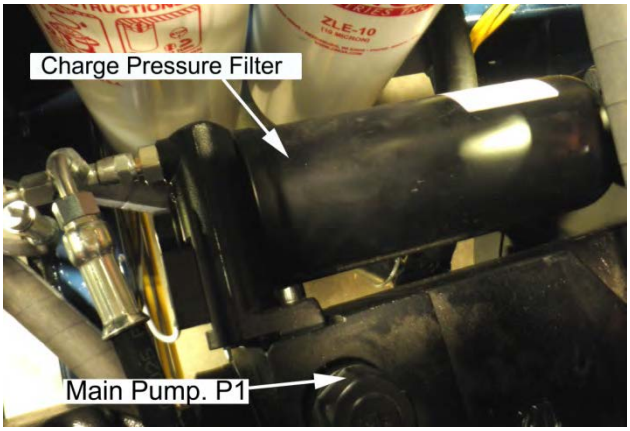
To access the front Filters remove the bulkhead cover plate.

Charge Pressure Filter.

The Charge Pressure Filter is mounted on the Drive System Pump (P1).
The Filter must be changed ***after the first 100 hours of operation.***

IMPORTANT

It is imperative that the area around the filter is cleaned before changing the filter to prevent any dirt from entering the drive system.



Controller 'A' - Filter Change Indicator.
After the initial filter change, a '**warning**' symbol indicates that the filter pressure is at the point that the filter must be replaced.
See screen on P3-05 showing the indicator symbol (No.15).

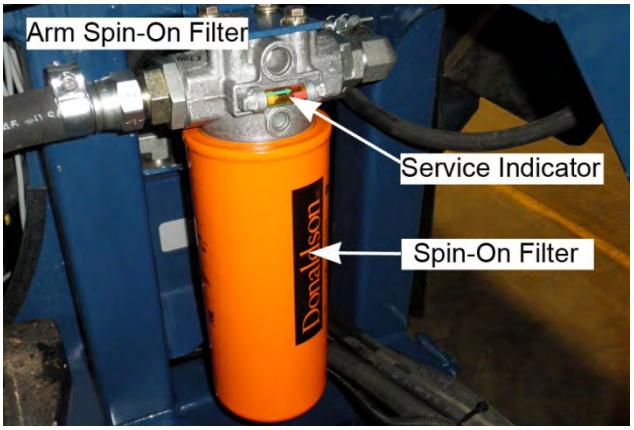
IMPORTANT

Do not delay the filter replacement.

Arm.Spin-On Filter.

Located at rear, to right of mast.

It is important that the Service Indicator is checked regularly.
If the indicator arrow moves into the '**RED**' zone the filter **must be replaced.**
Do not delay the filter replacement.
Refer to the instructions on the filter case for removal and Installation.



Drive System – Torque Hubs.

IMPORTANT

It is important that the oil in the Torque Hubs is changed **after the first 50 hours of operation** and then every 1000 hours.

EP150 OIL *MUST BE USED*

The following procedure is recommended :

Refer to IMPORTANT note at lower right of page.

WARNING

Machine weights are: 16in.18641lbs (8455kg) .
18in.19141lbs. (8682kg.)
Use a jack, and support stands, with the load capacity to handle these weights.
Surface must be solid and stable, preferably concrete .

Front Wheels.

- Position the Jack at the center the front cross beam and raise the front wheels clear of the ground.
- Position stands at each side under the cross beam. Carefully lower the machine onto the stands.

Rear Wheels.

- Position the Jack under the side beam, in front of the rear wheel. Raise the wheel clear of the ground.
- Position the stand under the side beam. Carefully lower the machine onto the stand. Repeat at opposite side.

To Drain the Oil.

Remove the bolts retaining the Plate (**A**). Reverse the Plate, with the 'top hat' facing inwards, and bolt it back into place. This releases the Hub Brake allowing the wheel to be turned.

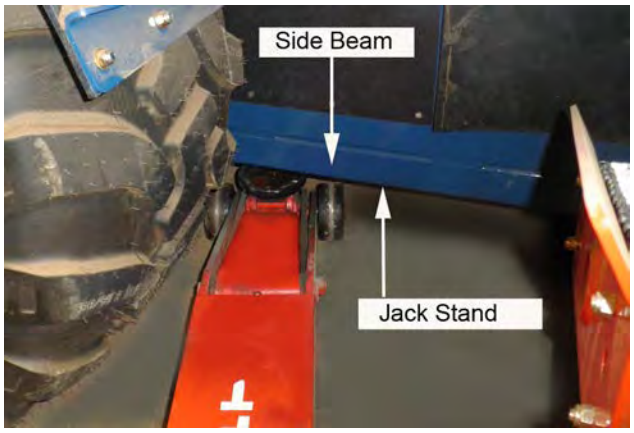
NOTE

The oil should be drained after the machine has been driven and the oil in the hubs ***is warm.***

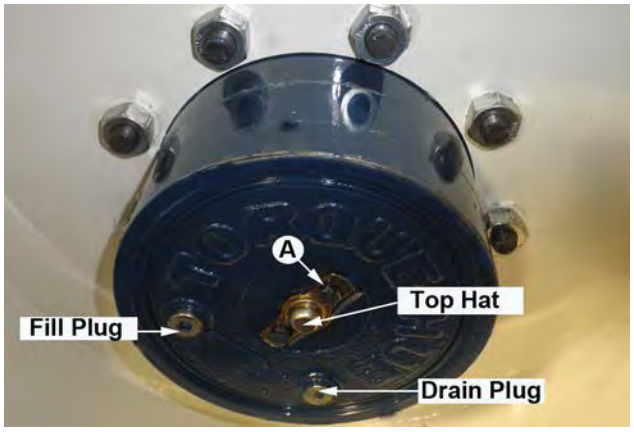
- Position the drain plug at the bottom. Loosen the fill plug, to relieve any vacuum. Remove the drain plug. Catch the oil in a suitable container.
- Remove both plugs. Clean any metallic particles from the magnetic faces. Replace the Plugs.
- Turn the wheel to position the fill plug at the top and the level/drain plug at 90 degrees to it. Remove the Level Plug.
- Fill the Hub until clear oil exits the level hole.
- Replace the Level Plug
- Remove and reverse the Retaining Plate (**A**) to its original position
- Jack up the machine and remove the stands.

The above procedure must be carried out on each Torque Hub at the hours of operation specified .

Front Wheels.



Rear Wheels.



Torque Hub.

IMPORTANT

Refer to page 4-12 for recommended procedure required, at 1000 hrs of operation, to check and re-torque the bolts attaching the rear Torque Hubs to the main frame.

HYDRAULIC SYSTEM

Drive System – Pressure test/adjust.

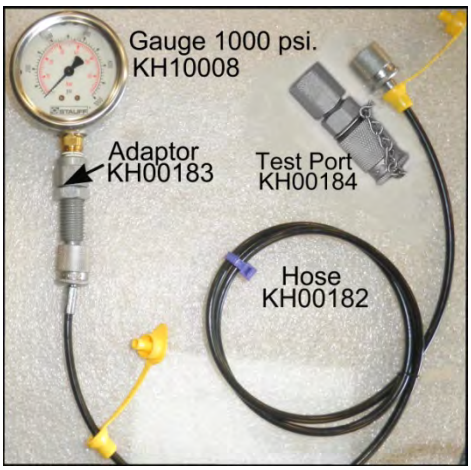


Fig.1

Fig.1
To facilitate easy and safe checking and adjusting of the Drive System Pressure, a Test port is fitted on the Loop Flushing Valve. If a Test Port is not installed on your machine it is recommended that one be obtained from the factory, also the 1000 psi. Gauge, Adaptor, and Hose.
The Test Port replaces a Plug on the Loop Flushing Valve.

CAUTION

To ensure safe and efficient procedures the correct equipment must be used. Failure to do so may result in personal injury and/or equipment damage.

Two persons should carry out this procedure.
One in the operator's seat, a second to attach the equipment and adjust the pressure.

Loop Flushing Valve.
(Located under the inner engine cover).
Fig.2/3

- Remove the plug in the Valve and fit the Test Port. Remove the Cap **'A'.**

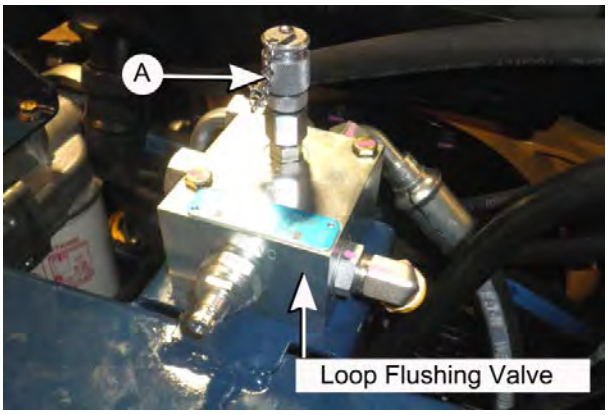


Fig.2

- Attach the Gauge **'B'** and Hose to the Test Port '**C**'.
- Set the Engine rpm to 1800.
  With the machine '**stationary**' the gauge reading should be 350/375 psi.
- Engage the Drive '**momentarily**'.
  The indicated pressure should decrease, to 20/30 psi. lower than the stationary psi.

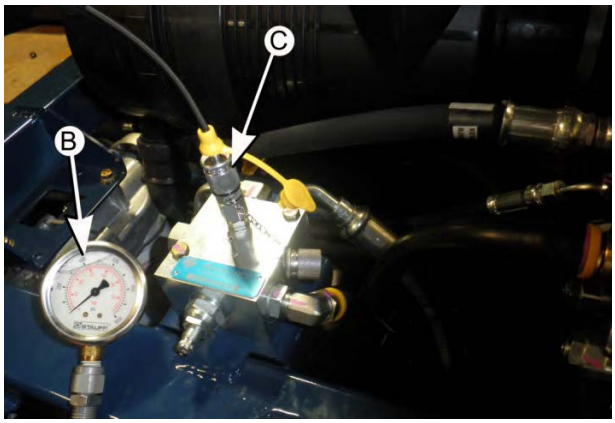


Fig.3

Pressure Adjustment.

Fig.4
Pressure is adjusted at the Relief Valve 'D' located on the top side of the Drive Pump.

- Loosen the Locknut '**E**'.
- Using a **6mm** Allen Key turn the Adjuster 'F' **CW** to **increase** pressure.
- Turn **CCW** to **decrease** pressure.
- Retighten the Locknut '**E**'.
- Remove the test equipment. Replace the cap on the Test Port.

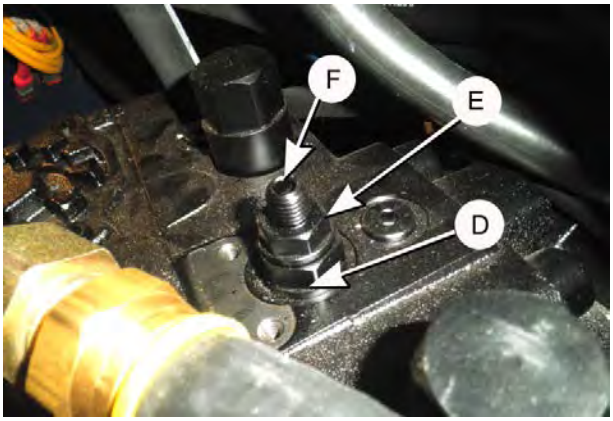
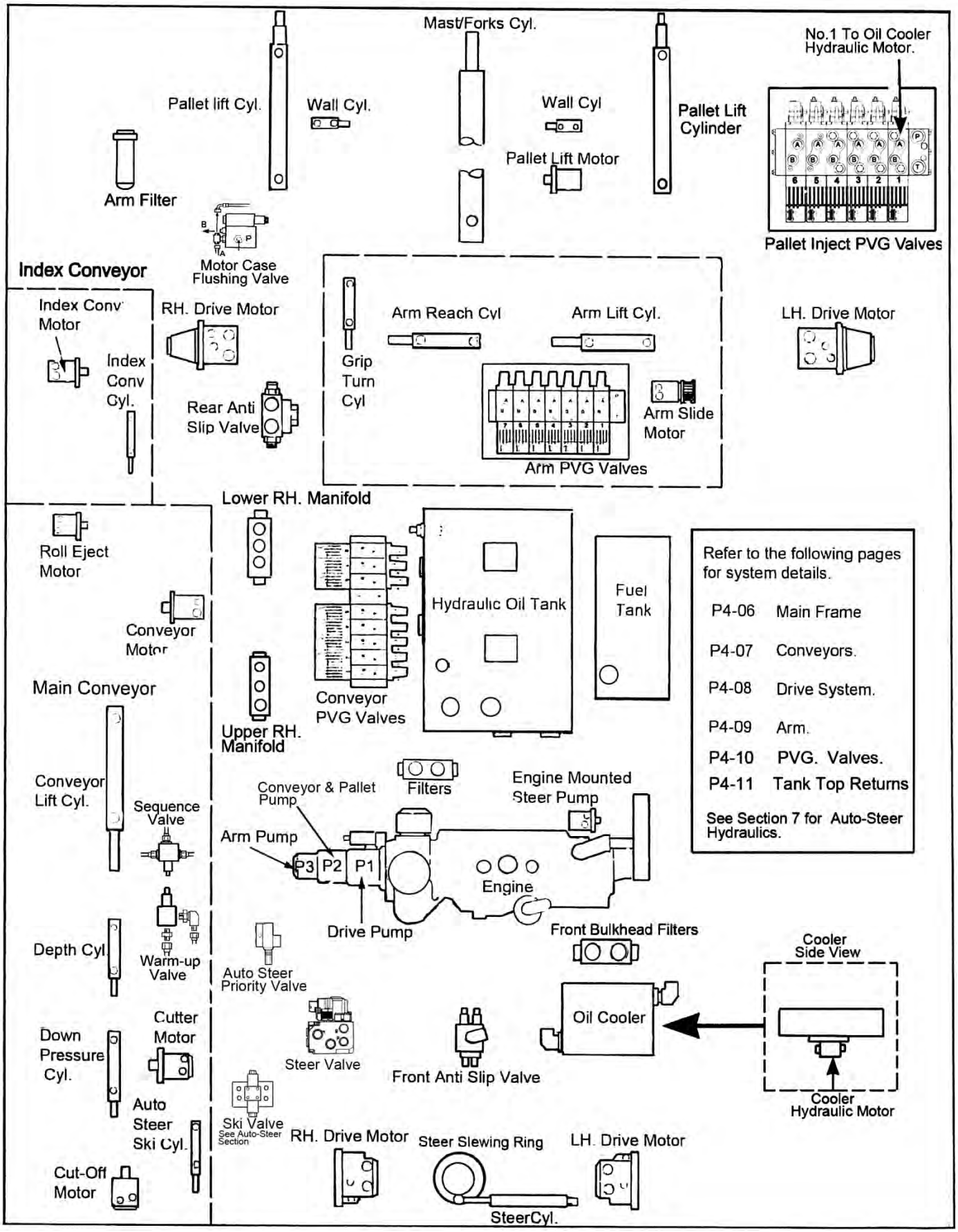
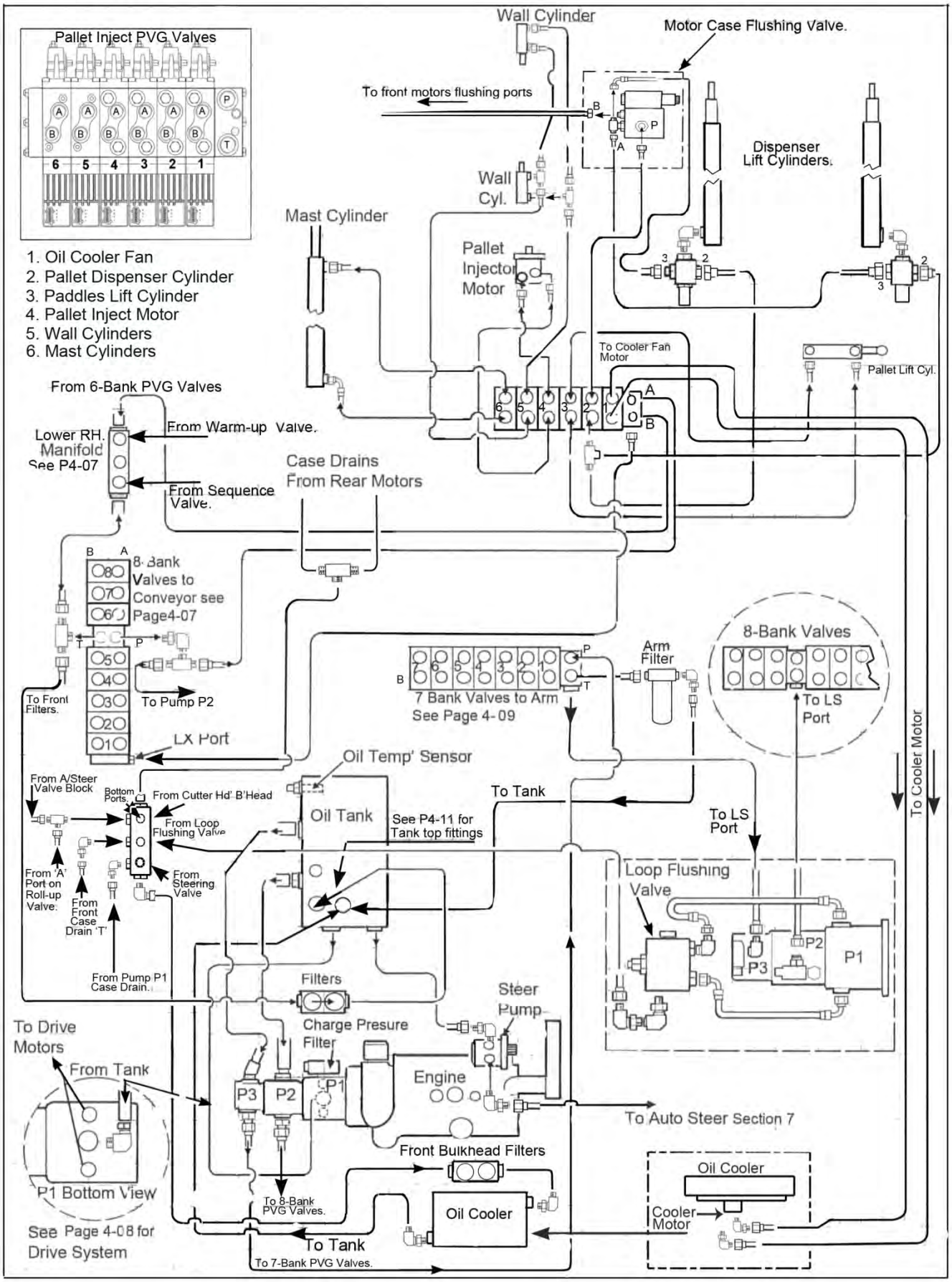


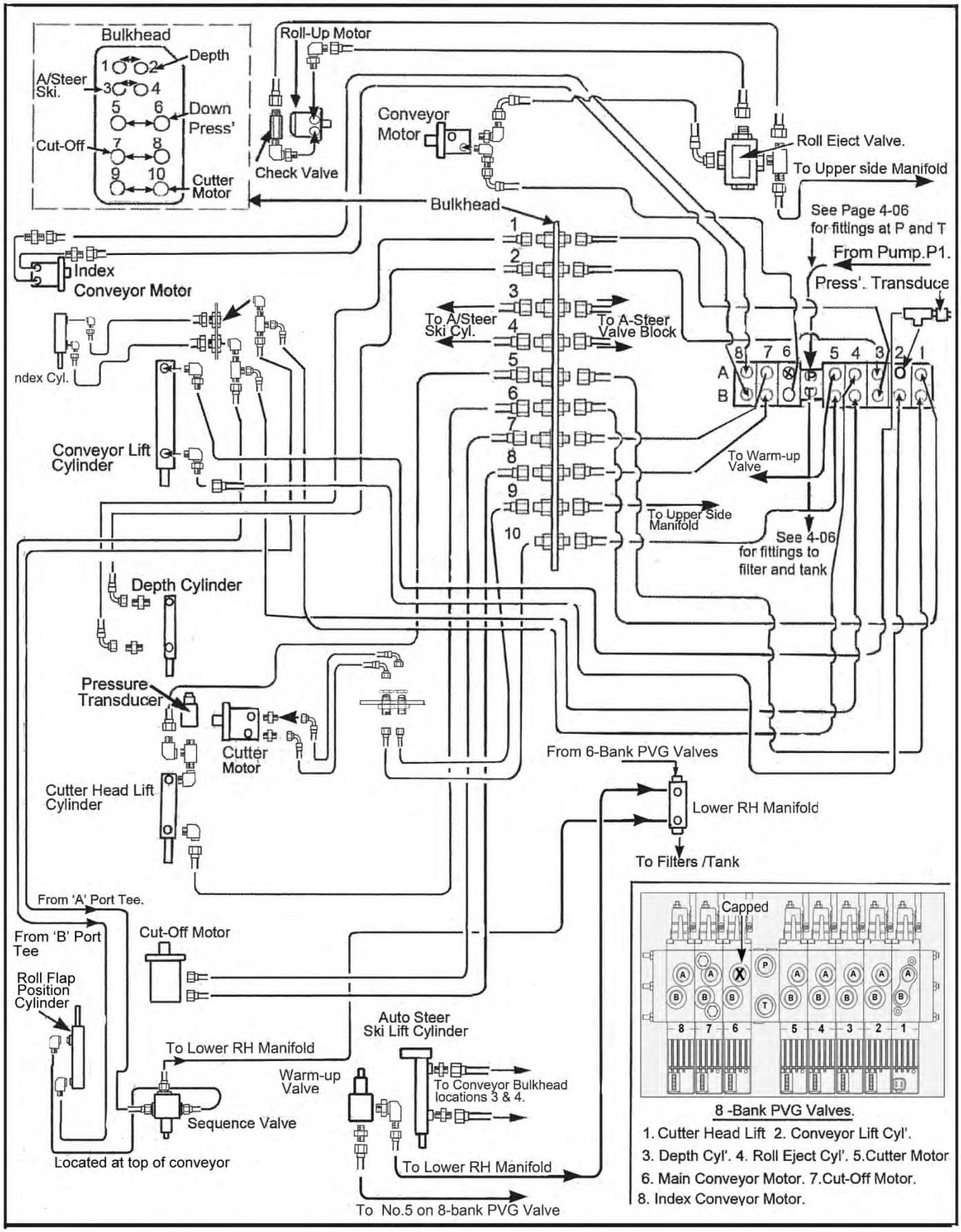
Fig.4


Mast/Forks Cyl.
No.1 To Oil Cooler Hydraulic Motor.
Pallet lift Cyl.
Wall Cyl.
Wall Cyl
Pallet Lift Cylinder
Pallet Lift Motor
Arm Filter
Pallet Inject PVG Valves
Motor Case Flushing Valve
Index Conveyor
Index Conv Motor
RH. Drive Motor
Arm Reach Cyl
Arm Lift Cyl.
LH. Drive Motor
Grip Turn Cyl
Index Conv Cyl.
Rear Anti Slip Valve
Arm Slide Motor
Arm PVG Valves
Lower RH. Manifold
Roll Eject Motor
Hydraulic Oil Tank
Fuel Tank
Conveyor Motor
Main Conveyor
Conveyor PVG Valves
Upper RH. Manifold
Refer to the following pages for system details.
P4-06 Main Frame
P4-07 Conveyors.
P4-08 Drive System.
P4-09 Arm.
P4-10 PVG. Valves.
P4-11 Tank Top Returns
See Section 7 for Auto-Steer Hydraulics.
Conveyor Lift Cyl.
Sequence Valve
Conveyor & Pallet Pump
Filters
Engine Mounted Steer Pump
Arm Pump
P3 P2 P1
Engine
Drive Pump
Front Bulkhead Filters
Depth Cyl
Warm-up Valve
Auto Steer Priority Valve
Cooler Side View
Cutter Motor
Down Pressure Cyl.
Steer Valve
Front Anti Slip Valve
Oil Cooler
Auto Steer Ski Cyl.
Ski Valve
See Auto-Steer Section
Cooler Hydraulic Motor
RH. Drive Motor
Steer Slewing Ring
LH. Drive Motor
Cut-Off Motor
SteerCyl.

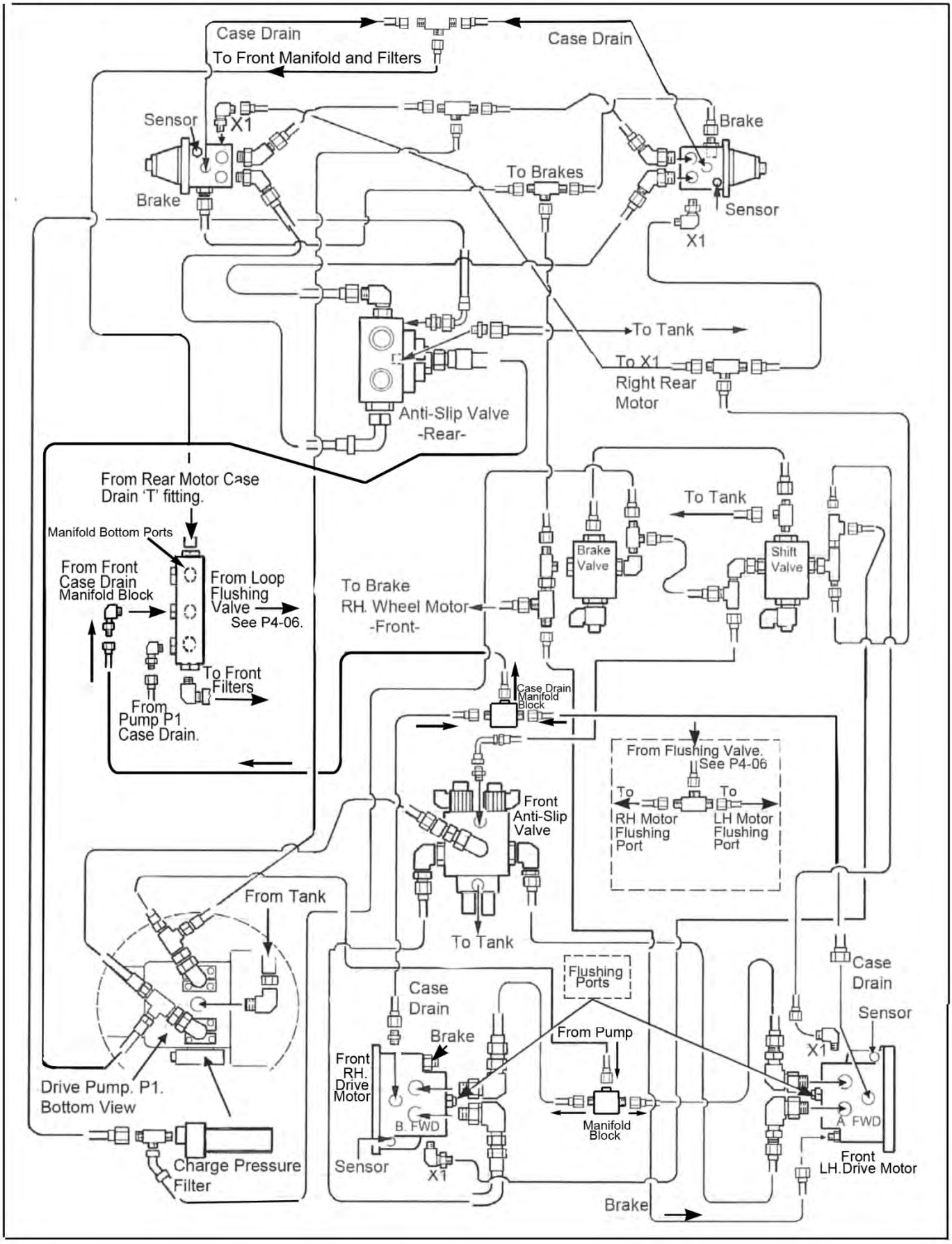
Hydraulic Layout. Main Frame.



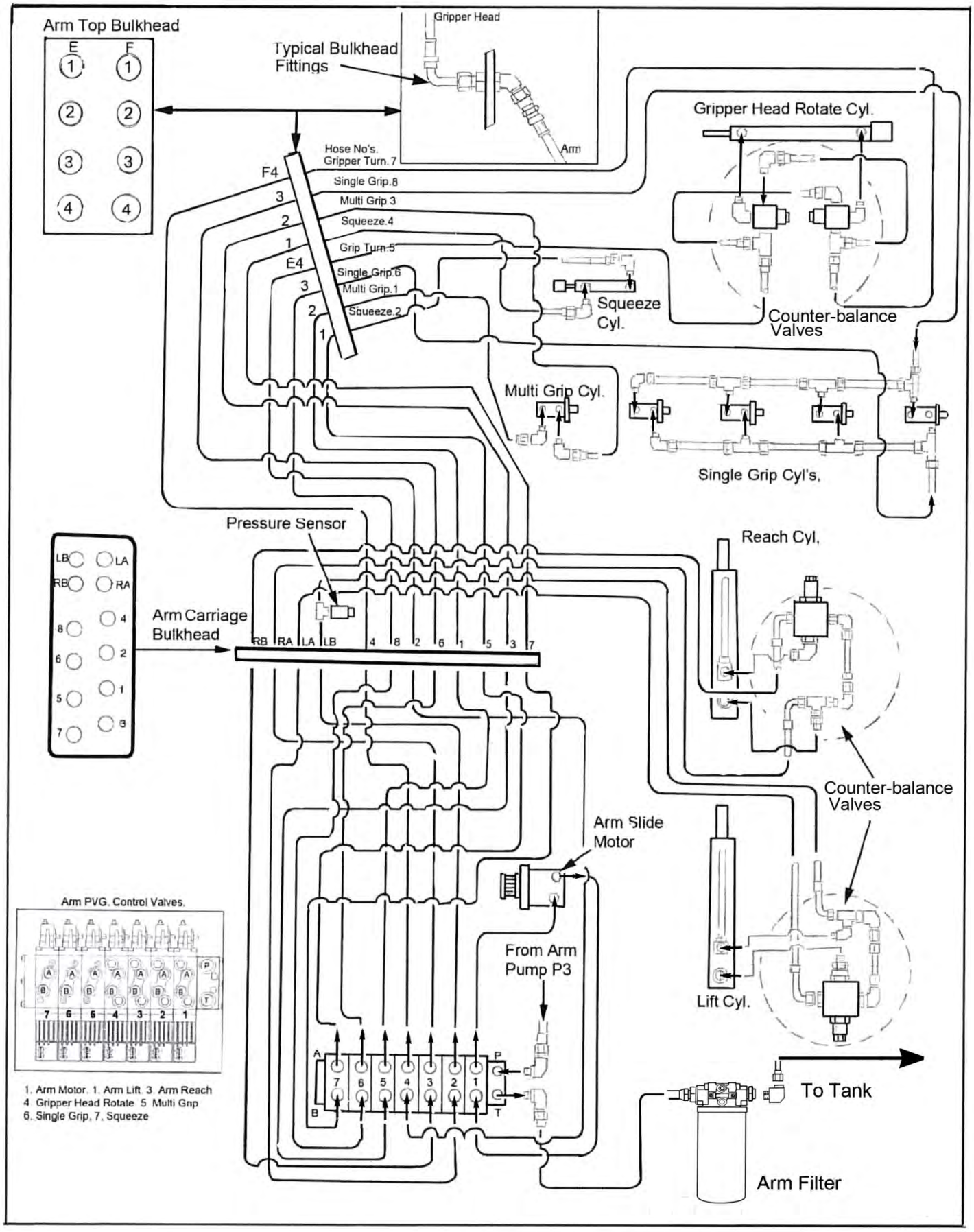
Main Conveyor – Hydraulic Layout.



Hydraulic Schematic. Drive System.



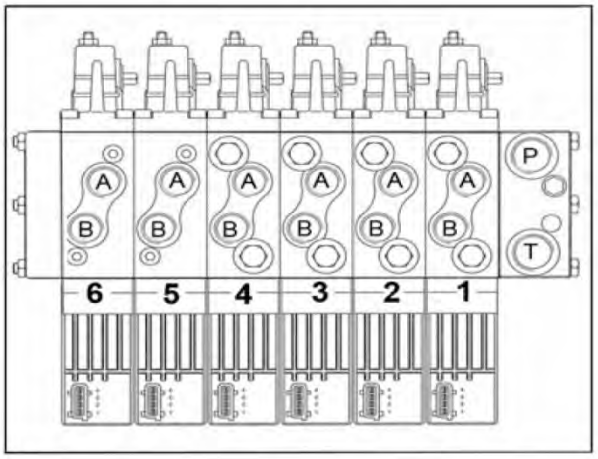
Hydraulic Schematic. Arm.



PVG Control Valves

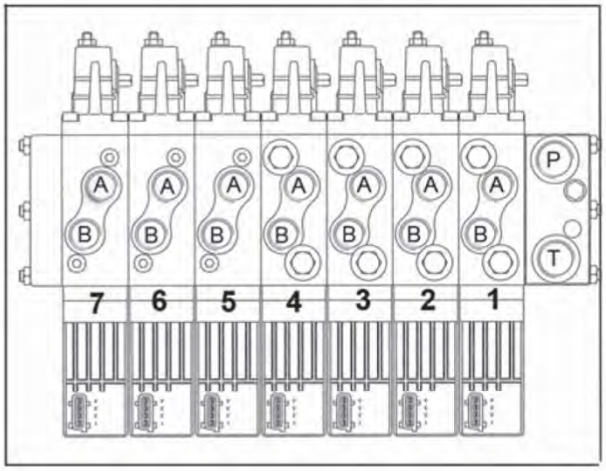
6-Bank PVG Control Valves.

1. Oil Cooler Motor
2. Pallet Dispenser Cylinder
3. Pallet Paddles Lift Cylinder
4. Pallet Inject Motor
5. Wall Cylinders
6. Mast Cylinder



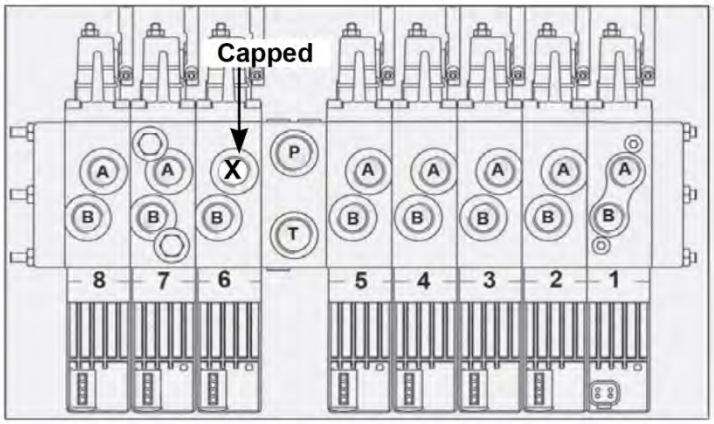
7-Bank PVG Control Valves.

1. Arm Motor.
2. Arm Lift Cylinder.
3. Arm Reach Cylinder.
4. Gripper Head – Rotate.
5. Multi Grip Cylinder.
6. Single Grip Cylinder.
7. Squeeze Cylinder.



8-Bank PVG Control Valves.

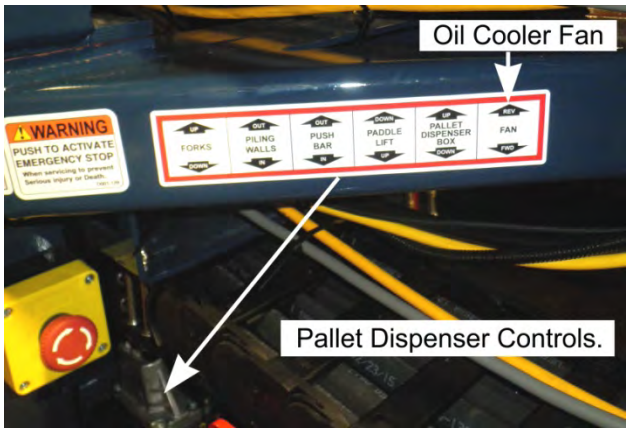
1. Down Pressure Cylinder.
2. Main Conveyor Lift Cylinder.
3. Depth Cylinder
4. Roll Eject Motor.
5. Cutter Motor.
6. Main Conveyor Motor.(6A Capped)
7. Cut-Off Motor.
8. Index Conveyor Motor.



Decal - Pallet Dispenser manual controls.

The Pallet Dispenser PVG Control Valves are located behind the left rear wheel.

The operating decal also indicates the control for the oil cooler fan.

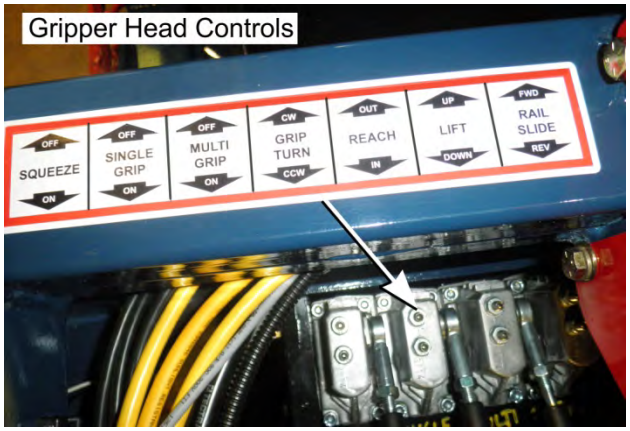


CAUTION

To prevent possible serious injuries when using the manual controls on the PVG valves, ensure that *all bystanders are well clear of the machine.*

Decal - Gripper Head manual controls.

The Gripper Head PVG Valves are located on the left side behind the cab.

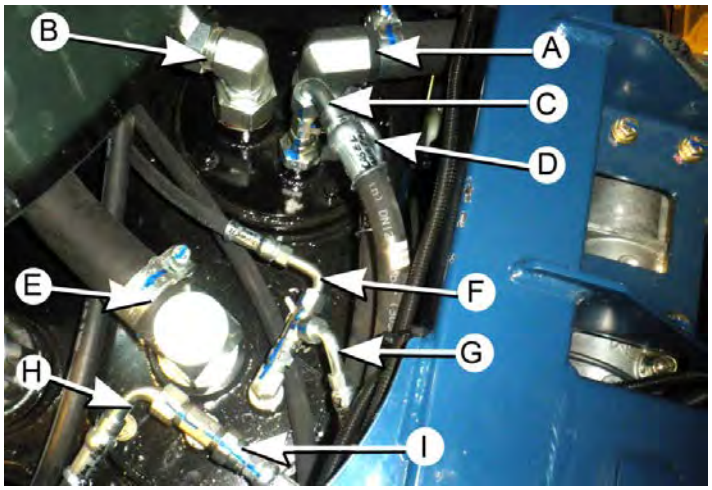


⚠ CAUTION

Manual operation of Shift Cylinders 2-4, or Squeeze Cylinders 1-5, may result in cylinders to over travel, causing damage to the gripper drive.

D001-367

Tank Top Return Connections.



A. Medium Pressure Filter (Arm Valve). Hydraulic Oil Cooler - Return.

B. Front Bulkhead Filters – Arm Filter Return.

C. Case Drain – Arm Pump.

D. Case Drain – Aux. Pump.

E. From Oil Cooler

F. Valve Drain – Brake Release Motor – Min.

G. Valve Drain – Brake Release Motor – Max.

H. Anti-Spin Valve Drain – Rear.

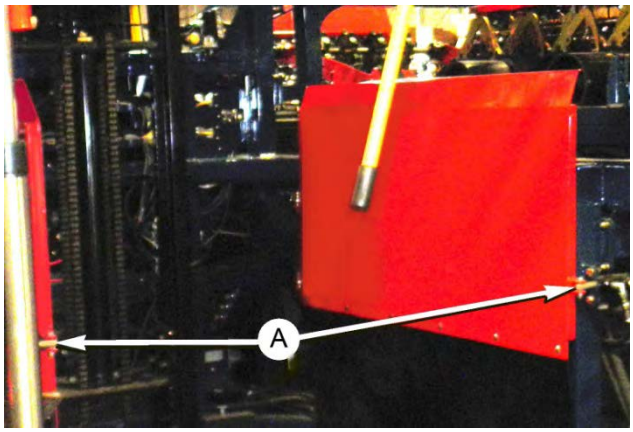
I. Anti-Spin Valve Drain – Front.

Rear Torque Hubs.

IMPORTANT

Every 1000 hours of operation the rear Torque Hubs 5/8 Bolts, six per hub, must be checked and tightened to 200 lbs/ft .

This recommended procedure should be carried out one side at a time, as shown.

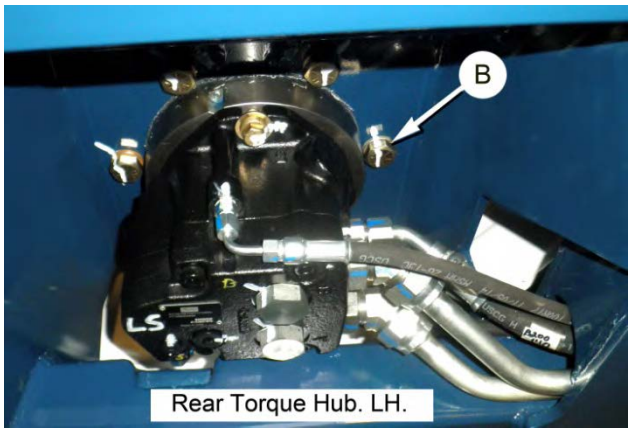


To access the rear Torque Hubs:

- Disconnect the Piling Wall Cylinders '**A**' and open the piling walls.
- Check the tightness of each Bolt '**B**', to 200 lbs/ft.
- To ease access to the bottom two bolts, use a suitable trolley jack to raise the machine.

CAUTION

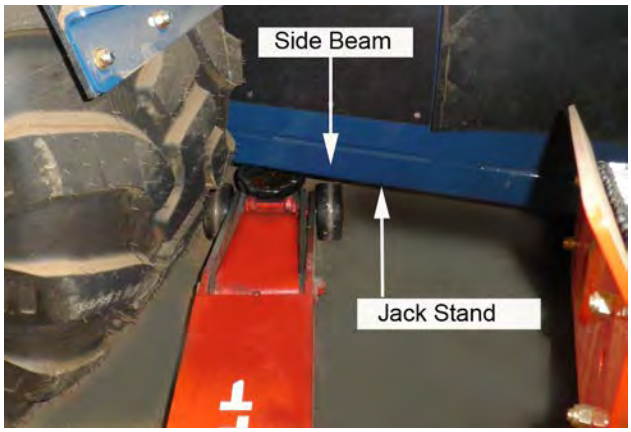
To prevent possible personal injury while tightening the lower bolts with the machine raised, position a jack-stand under the side beam as indicated.



- Close the piling walls and re-connect the cylinders.

NOTE

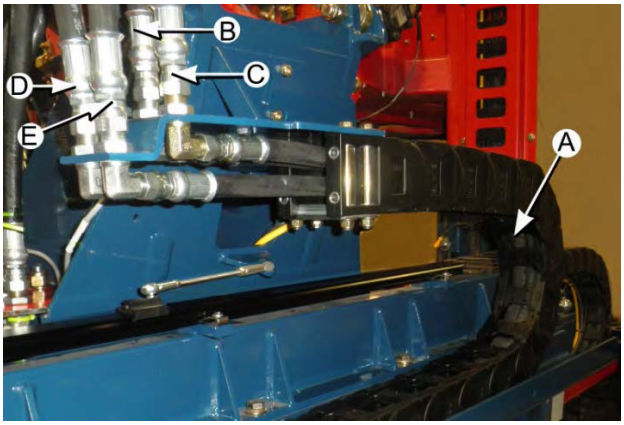
The front wheels and torque hubs are not subject to the same high operating loads as the rear ones so this procedure is not necessary.

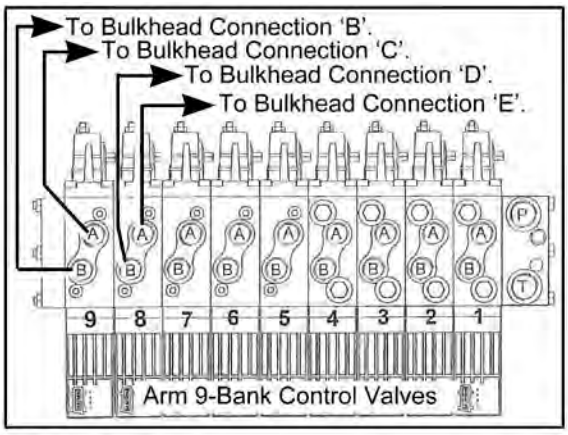


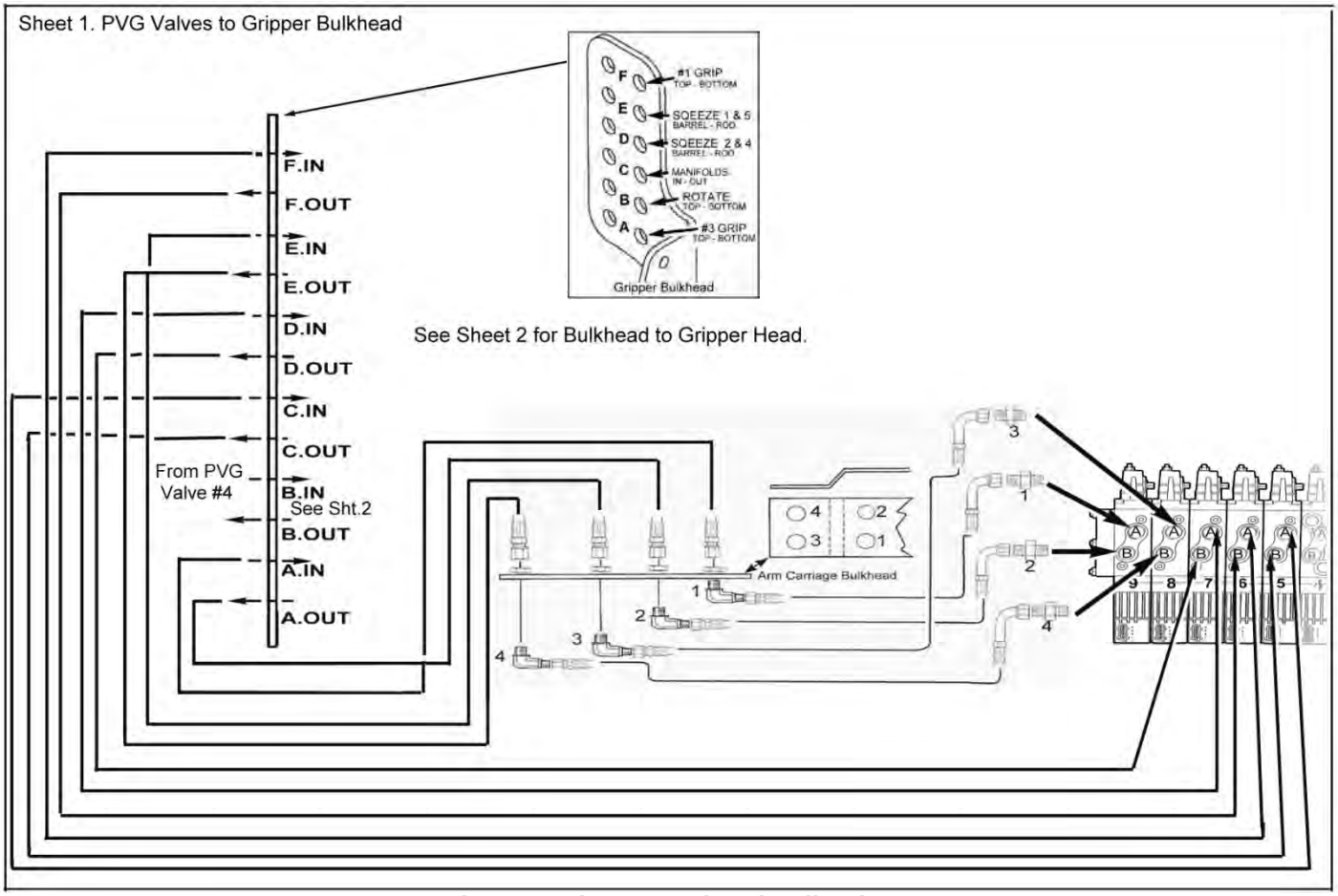
Arm Gripper Head Hoses - Euro Specification.

For Euro-Spec machines two valve sections, 8 & 9, are added to the Arm PVG Valve Bank.
The four hoses from the valves 8 & 9,are routed through the 'power-trac' unit '**A,**' to bulkhead connections **'B'**, **'C'** **'D'** & **'E'** on the Arm Carriage.
From the bulkhead the hoses connect to the gripper head.

Refer to schematics sheets 1 and 2.

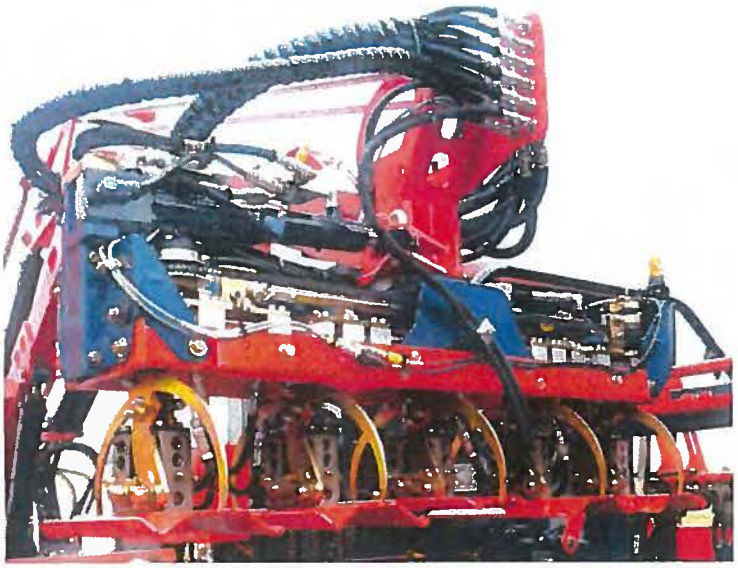




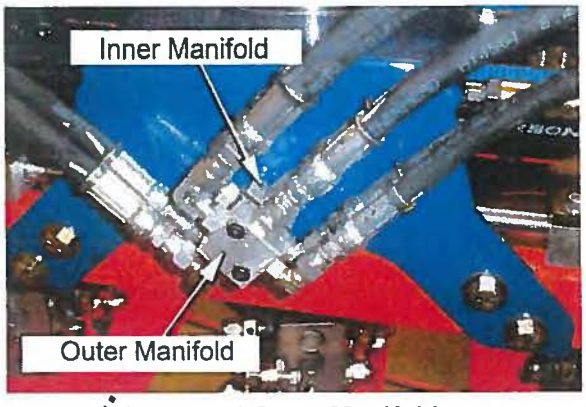


Sheet 1. Gripper Head Hydraulic Diagram

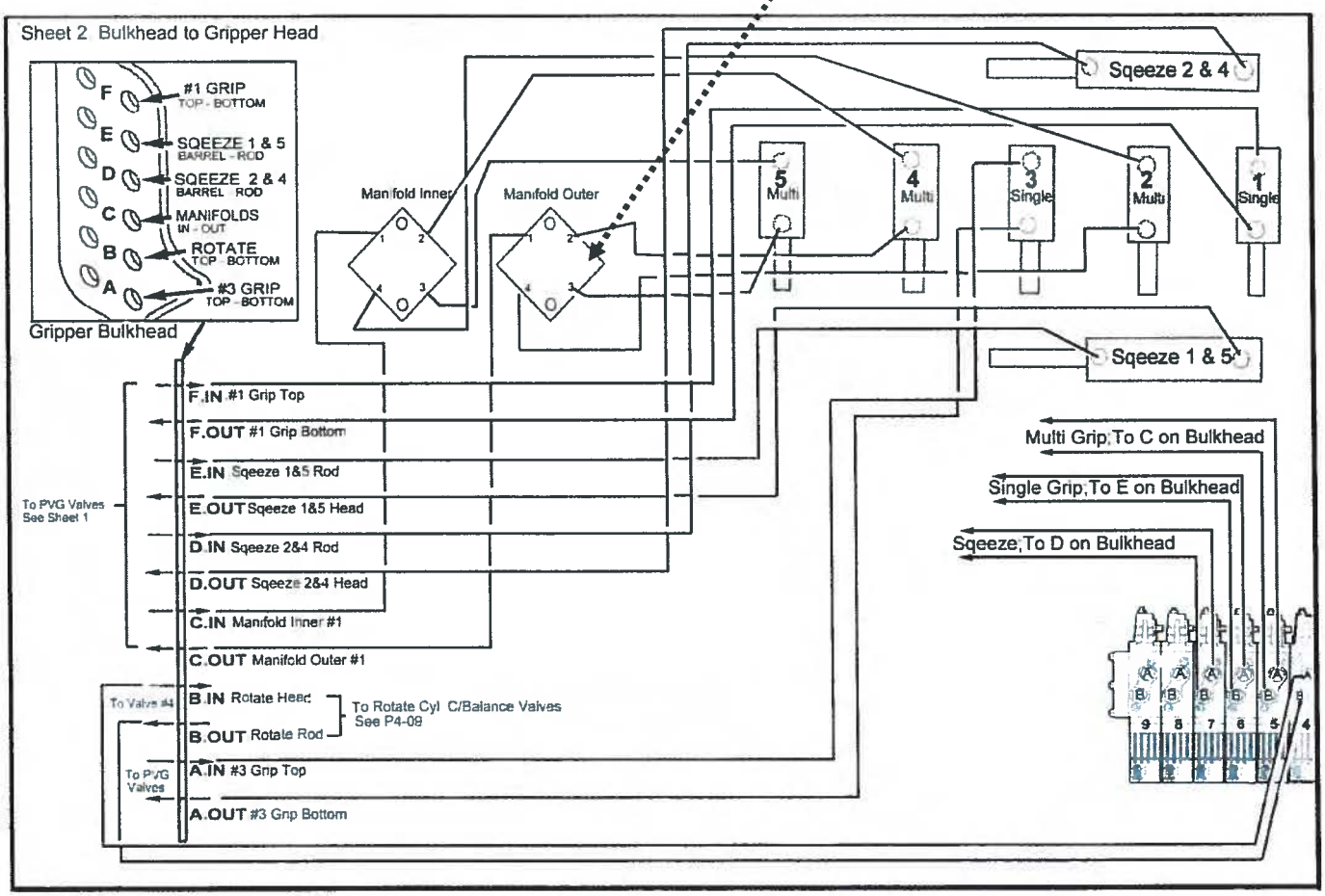
Arm Gripper Head – Euro Specification.
Hydraulic Hoses. Sheet 2.



Gripper Head. Euro-Spec.



Inner and Outer Manifolds

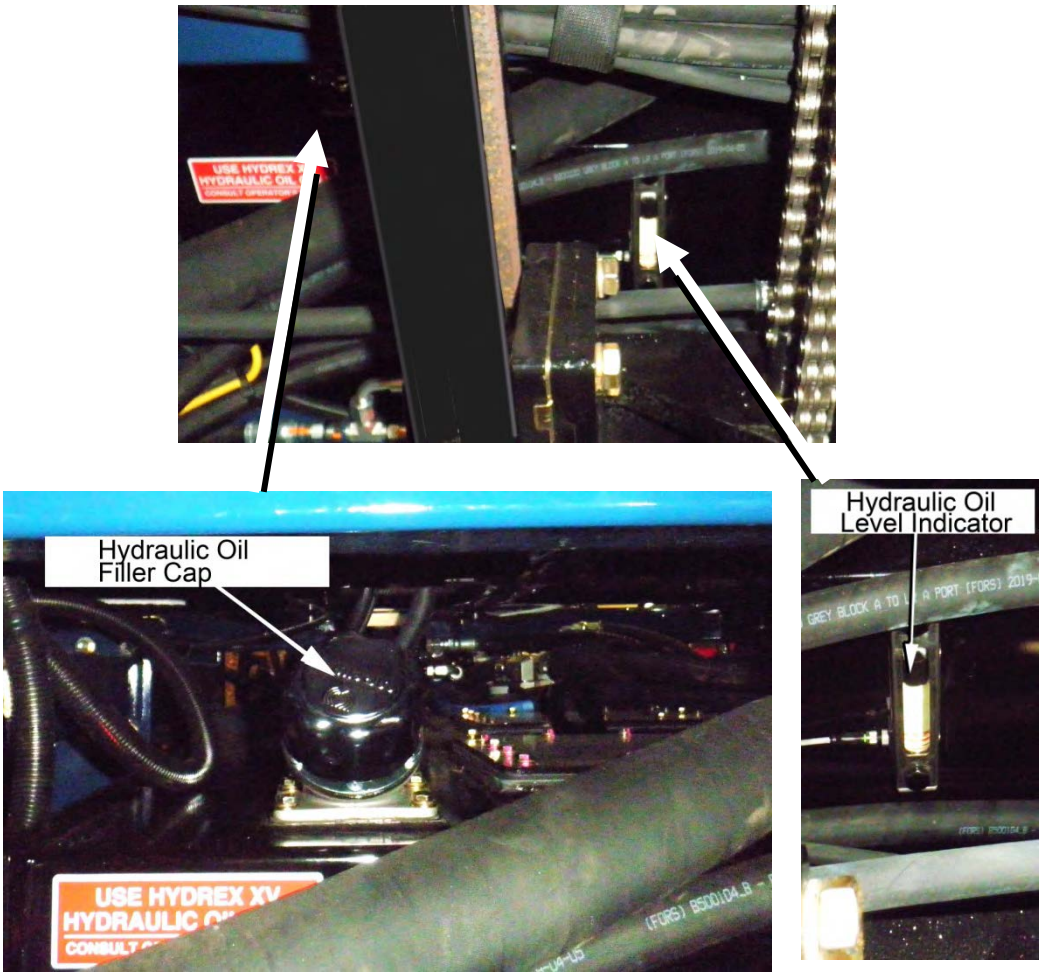


Sheet 2. Gripper Head Hydraulic Diagram.

Hydraulic Oil Filler Cap and Oil Level Indicator.

The Hydraulic Oil Filler Cap and Oil Level Indicator will be located on the rear face of the oil tank as shown below. The level indicator is located to the lower right of the filler cap.
A Flange Cap will be fitted at the previous location of the filler cap
Check if this change has been made on this machine.

Page 4-01 in the manual will show the front location of the filler cap and oil level indicator.



SECTION 5

Electrical Schematics:

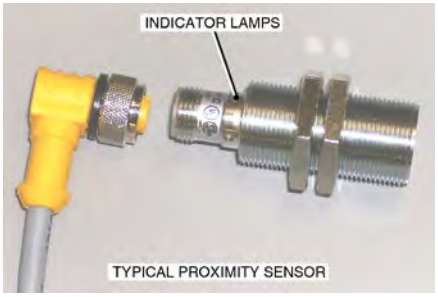
Section 5

The design of the wiring system simplifies the tracing of electrical faults, and repair/replacement of cables.

'YELLOW' cables, from the Electrical Control Box, are connected to Multi-Port Connector Blocks. See page 5-06.

A **'GREEN** Lamp on Multi-Port Connector Blocks indicate power from the Main Electrical Control Box. See page 5-05.

A **'YELLOW** Indicator Lamp, at each 'port connection', indicates signal power is **'ON'** in the Cable connecting it to its particular function.



Proximity Sensors.
The Proximity Sensors have Power **'ON'** Indicator Lamps. Indicator Lamps allow the power loss at any Sensor to be quickly traced .
The threaded Connector Plugs are sealed, and designed to be trouble free, but should be checked periodically for tightness, and for moisture or corrosion in the Connectors.

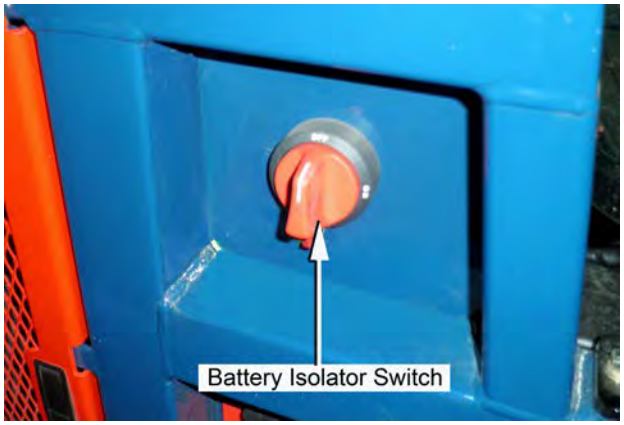
IMPORTANT

- If a problem persists with the operation of the machine, due to electrical faults, it is recommended that you contact your Brouwer Dealer, or the Factory Service Department.
- The diagnosis and/or repair of electrical problems that are beyond the scope of this manual, **must be done ONLY BY FACTORY TRAINED TECHNICIANS, using the proper diagnostic equipment.**

Battery Isolator Switch.

CAUTION

The Battery Isolator Switch ***MUST*** be '**OFF**' before **doing any welding procedures on the machine.** Failure to follow this instruction will result in serious damage to the Electrical System Components.



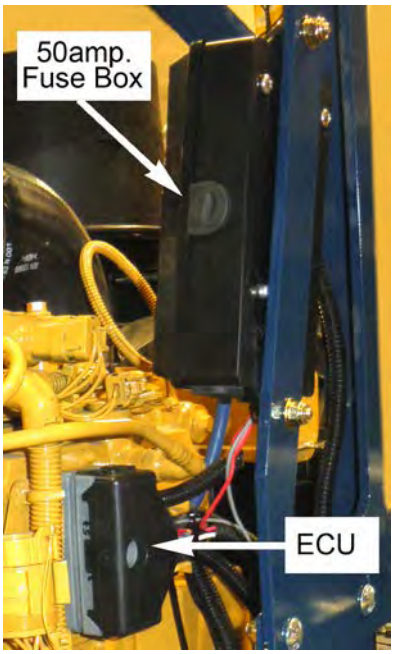
IMPORTANT

When the machine is left unattended, or is to be stored for any period of time, the Battery Isolator Switch should be 'OFF' and a lock fitted to prevent unauthorized persons from starting the engine.

Glow Plug 50A. Fuse & Relay Box location.

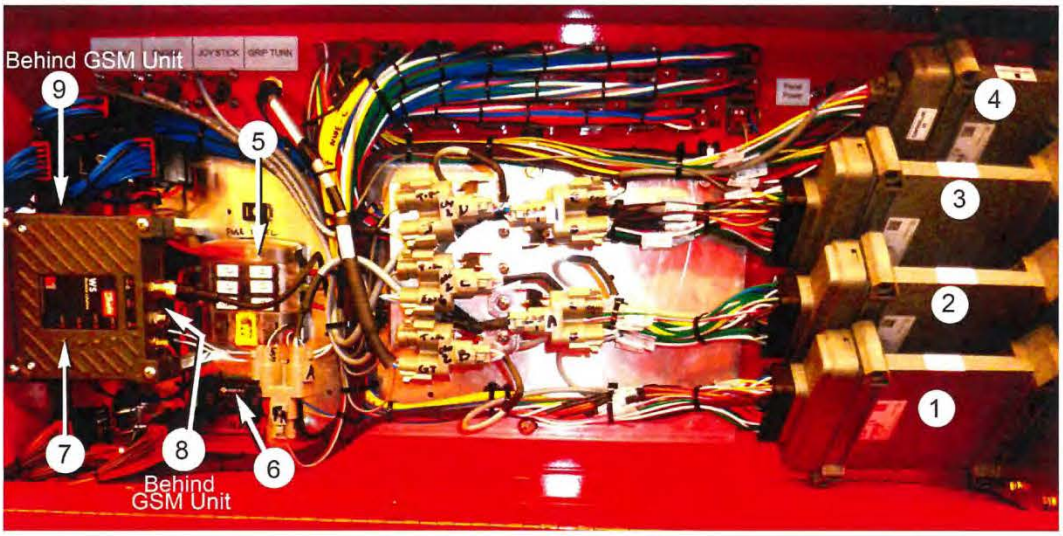
The Fuse and Relay Box is mounted on the engine cover support.
See page 5-03 for inside details.

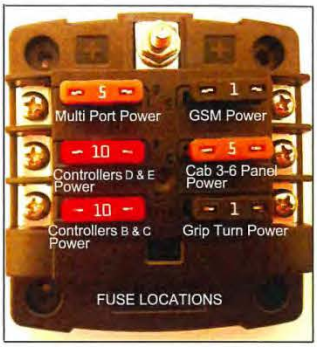
Power to the box is taken from the Starter/Alt' fuse connection , located on engine block.
See below.



ELECTRICAL SYSTEM

Main Electrical Control Box. (Rear of Cab. Left Side).





5. Fuse Locations

1. Controller '**B**'. Arm.
2. Controller '**C**'. Engine & Conveyor.
3. Controller '**D**'. Pallet Injector.
4. Controller '**E**' Output Module
5. Fuses. (See inset).
6. 12/24V Convertor.
7. Remote GSM System.(Option).
8. System Power Relay. (Behind GSM Unit).
9. Reverse Alarm Relay(Behind GSM Unit Refer to schematic on P5-18.)

Plug Pin Connections: Detail of decal on inside of control box cover.

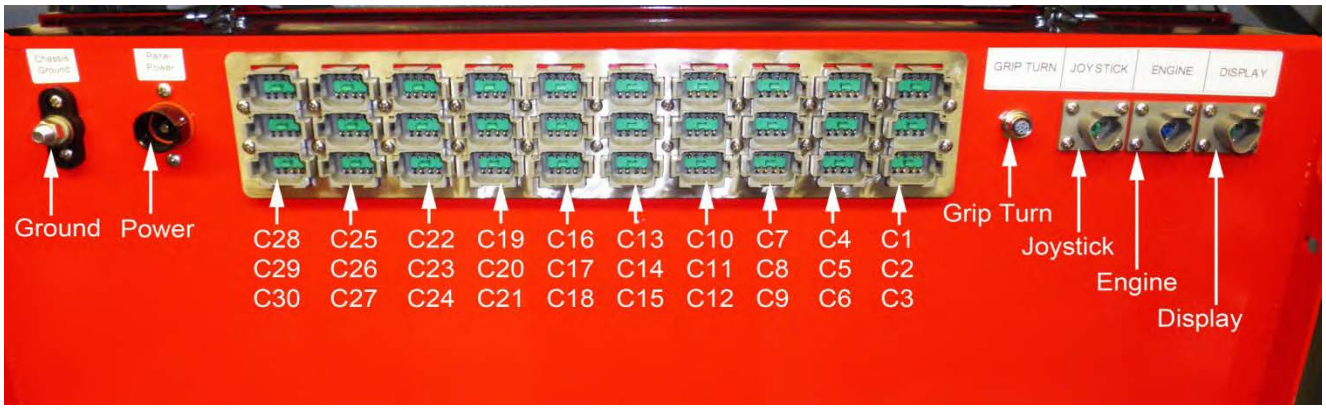
C1 From Panel / Cab	C4 ARM Multiport	C7 Lft. Middle Multiport	C10 Analog 5	C13 Propel Multiport	C16 Right Rear Valves	C19 Rail/G-Turn	C22 Inj/P.Wall	C25 Accumulator	C28 Euro Grip
Rev. Alarm	Lift Pos.	Right Rear Direction	FL PPU	Brake Release	RL ASV	Rail PVE	Injector Up	Bad Roll Open	Grip 1&5 Sense
Strobe	Reach Pos.	Hyd. Oil Level	FR PPU	Forward	RR ASV	PVE Pwr	Injector Down	Bad Roll Close	Grip 2&4 Sense
Left Sig. Sw.	Lift Press.	Spare	RL PPU	2 Speed	Eject				
Left Signal	Rail Position	Conv. DP Sense	RR PPU	Reverse	Spare				
Right Signal	Shield	Shield	Shield						Shield
Right Sig. S									
Rev. Lights						PVE Pwr	Piling Wall Close	Index REVerse	
Brake Lights						Grip Turn PVE	Piling Wall Open	Index ADVance	

C2 To Panel from Cab	C5 Injector Multiport	C8 Rt. Middle Multiport	C11 Conveyor MP	C14 ASV Multiport	C17 Grip	C20 SQZ/Forks	C23 Cutoff/head Lift	C26 Depth/Conv.Lift	C29 Euro Grip
Seat Sw.	Push Bar Home	Fork Ground Prox	Cut Off Prox	FL ASV	M Grip Open	Squeeze On	Cut Off PVE	Depth INCrement	Mid Grip Open
Road/Harv. Mode sw.	Push Bar Away	Conveyor PPU	Head Press. Sense	FR ASV	M Grip Close	Squeeze OFF	PVE Pwr	Depth DECrement	Mid Grip Close
Brake Sw.	Paddles Up	Index Prox	Roll End						
Spare	Paddles Down	Filter Switch	Conveyor Down						
E-Stop Cond.			Shield						
Hazard Sw.									
E-Stop					S Grip Close	PVE Pwr	PVE Pwr	PVE Pwr	PVE Pwr
Spare					S Grip Open	Forks PVE	Head Lift PVE	Conveyor Lift PVE	Shift Grip PVE

C3 Cab/Panel Analogue	C6 Lft. Rear Multiport	C9 Analog 12	C12 Cooling	C15 Steer Multiport	C18 Reach/Lift	C21 Pal. Inj.	C24 Cutter/Conv	C27 E-Stop	C30 Spare
A-Steer	Load Position	Axle Position	Cooling Fan	Steer Left	Reach PVE	Paddles Up	Cutter PVE	Estop out	
Cutter	Pallet Clear	Oil Temp	Fan Reverse	Steer Right	PVE Pwr	Paddles Down	PVE Pwr	Estop in	
Conveyor	Injector Down	Ski Position		Ski Up				Estop out	
Eng. RPM	Injector Up	Fork Position		Ski Down				Estop in	
Pedal		Shield						Estop out	
+12 volts								Estop in	
0 Volts			Motor Flush		PVE Pwr	Push Bar Back	PVE Pwr		
+ 5 Volts					Lift PVE	Push Bar On	Conveyor PVE		

D001-347

Back of Main Electrical Control Box – Output Connections.

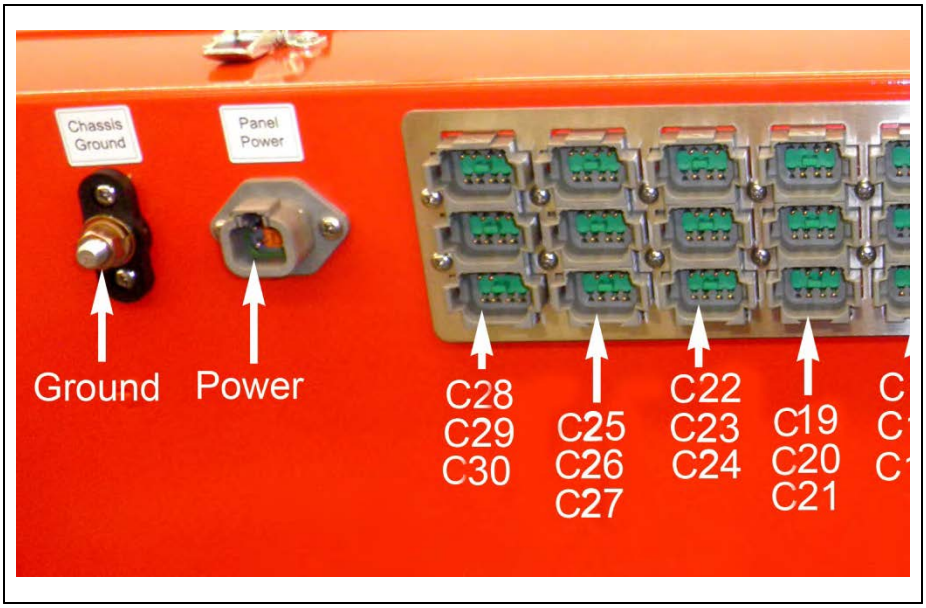


Main Electrical Control Box

The Euro Specification has additional output connections at the back of the main electrical control box.

These are identified as C28; C29; and C30.

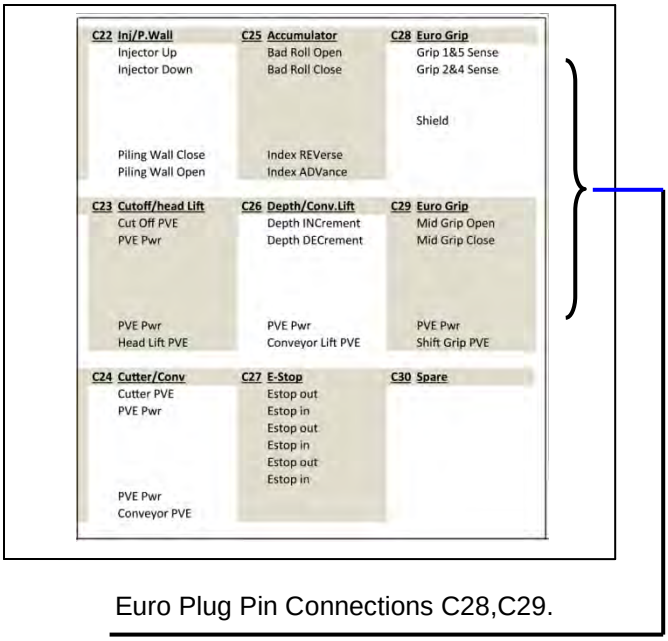
Plugs C28 and C29 are used and the functions are identified in the figure below.



Main Electrical Control Box

Plug Pin Connections

Refer to **C28** and **C29** to identify the plug pin connections.



Euro Plug Pin Connections C28,C29.

The Service Panel Tray (Relays and Fuses), is located under the cab, above the cab side step.

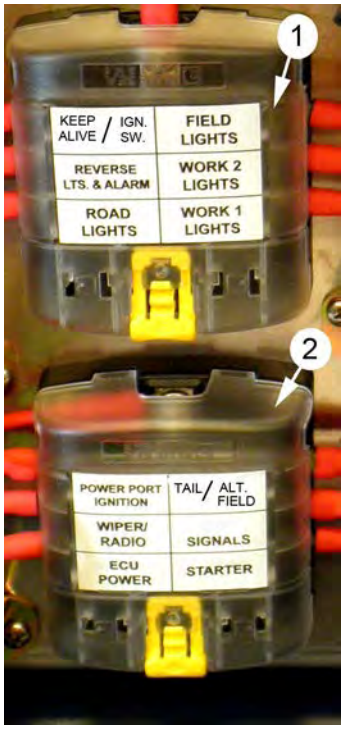
To access the Tray, release the Catches on each side and slide it out.

The hinged lid is secured with a soft touch knob. Rubber sealing prevents the entry of water and dust.

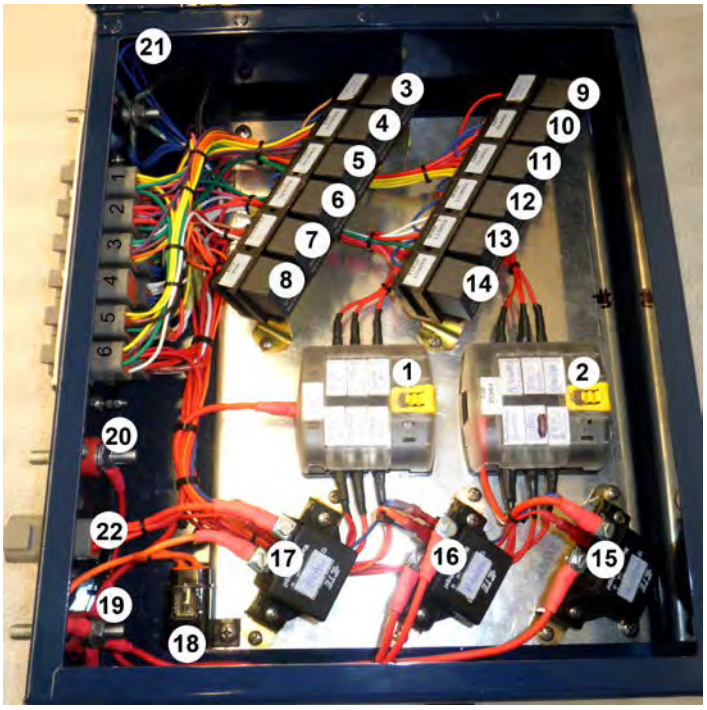
Interior details are shown below.

NOTE: Refer to Page 5-14 for schematic details.

Glow Plug Control Box.
See P5-01 for location.



Fuse Blocks 1 & 2.



Service Panel – Under Cab

Fuse Block 1: Keep Alive /Ign.Sw.10A. Reverse Lts.& Alarm10A. Road Lts.15A. Field Lts.15A. Work Lts.-2.15A. Work Lts.-1.10A.
Fuse Block 2: Power Port Ign.15A. Wiper /Radio.15A. ECU Power.20A Tail/Alt.Field.5A. Signals.10A. Starter.15A.

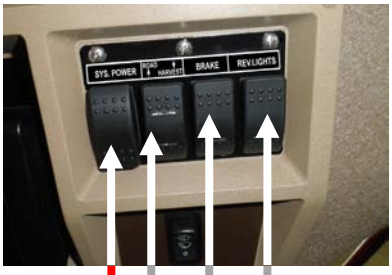
Relays :
3. Panel 'OFF'.
4. Reverse Lts.
5. Right Signal
6. Road Lts..
7. Starter.
8. ECU. Run.
9. Panel 'ON'.
10. Back-up Alarm.
11. Left Signal.
12. Work Lts.-1.

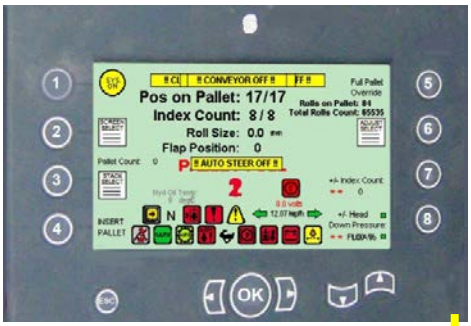
Relays:
13. Work Lts.-2.
14. Field Lts.
15. Ignition
16. Panel.
17. HVAC.

18. Fuse – HVAC.
19. Battery (+).
20. Panel Power.
21. Ground Post.
22. Connector

Cab Wiring.

Cab Switch Plate



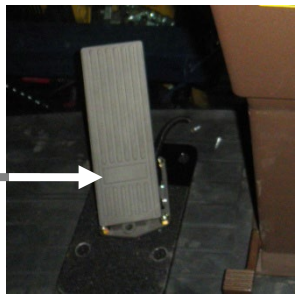


Cab Display. Controller 'A'.

20 Pad Control.

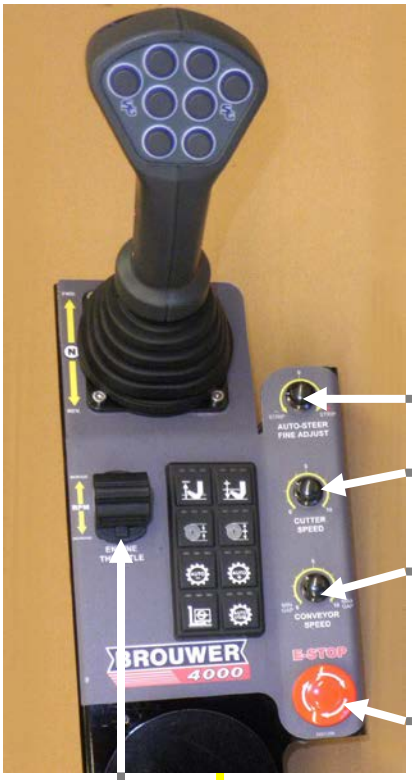
NOTE
See pages 14 to19
for electrical schematics.

Engine Information Center



Brake/Inch/Clutch Pedal.

Control Console.



Control Handle.

Under Cab
Service Panel. See page 5-03

To Main
Electrical
Panel.
Page 5-02

System Power

System Controller ‘A’. Cab Display

If **!!NO CAN BUS!!** is displayed it indicates one of the following :

1.

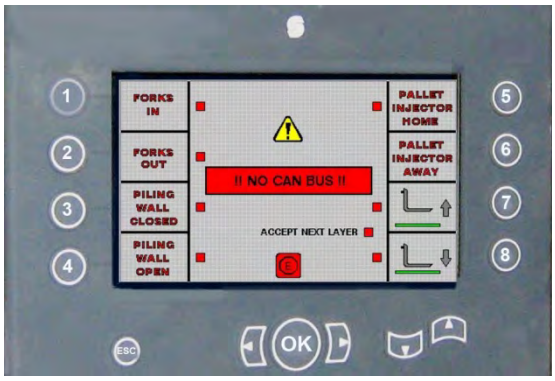
- **Loss of power to Controller No.4 (see P5-02).**
  Check the LED lamp on the Controller. If it is **‘ON’** the Controller may be faulty.

  If the LED lamp is not ‘**ON**’, check the wiring to the controller to restore power.

2.

- **Loss of signal from the controller to the display.**

If the above checks fail to restore functions, call your Dealer or the factory Service Department.

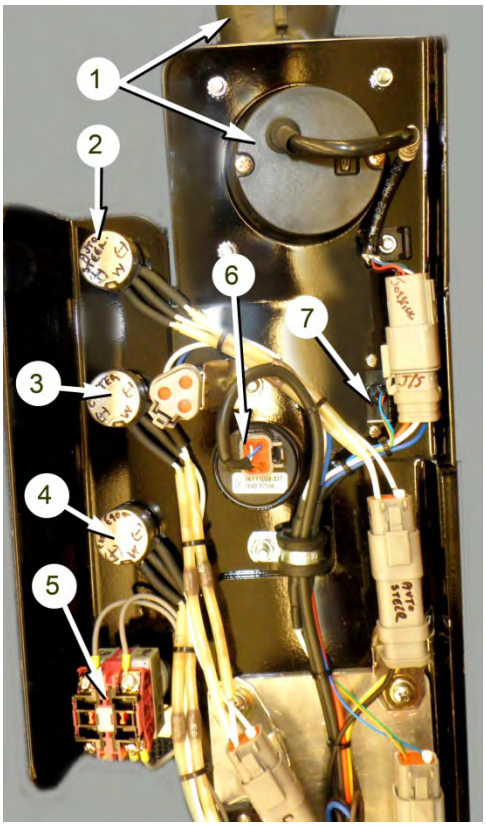


Cab Display.

Control Console.

Underside wiring.

1. Control Handle.
2. Auto-Steer Fine Adjust Potentiometer.
3. Cutter Speed Potentiometer.
4. Conveyor Speed Potentiometer.
5. E-STOP Switch.
6. 8 Button Key Pad Connection.
7. Engine RPM Control.



Control Console – Underside.

ELECTRICAL SYSTEM

Multiport Blocks.

The locations of the Multiport Blocks are show on the opposite page.
This page illustrates each cable connection from the Multiport Blocks to the operating function.

IMPORTANT

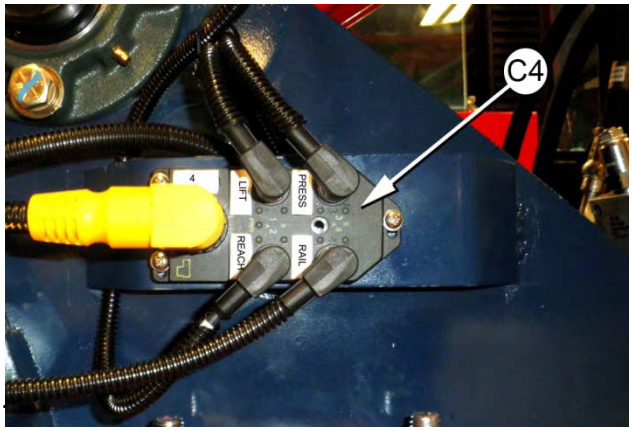
Do not direct jet of high pressure washer at electrical components.

Keep all electrical connections clean and tight

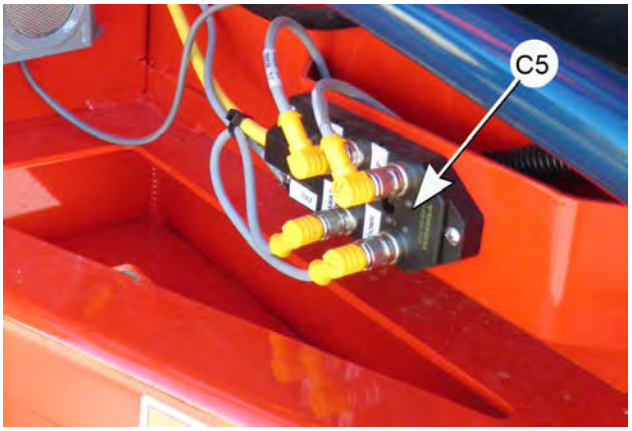
NOTE

ASV (Anti Spin Valve)
PPU (Pulse Pick-up)
Press (Pressure)
Pos. (Position)
Spare (Not used)
RL (Rear Left)
RR (Rear Right)
FL. (Front Left)
FR. (Front Right)

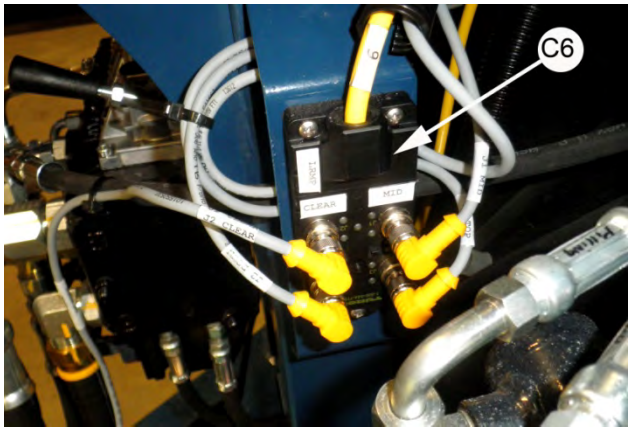
Multi-Port Connector Blocks.
NOTE: Refer to page 5-02 for details of the Multi Ports cable connections at Main Electrical Control Box.



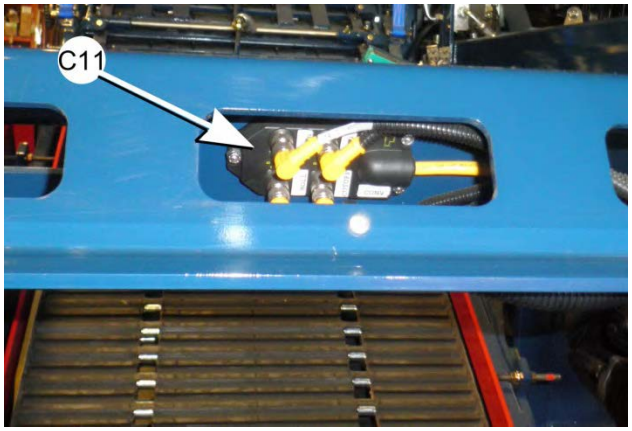
Arm Multiport.



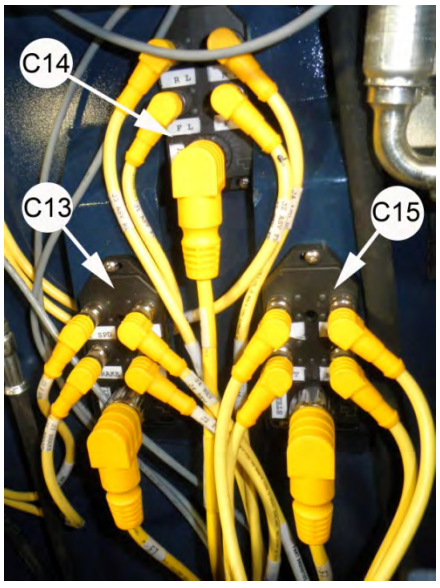
Injector Multiport.



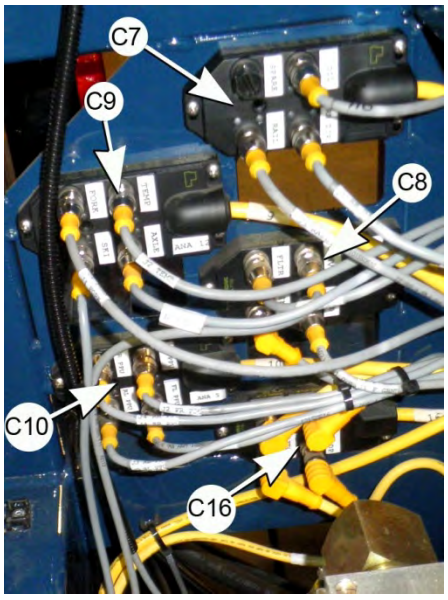
Left Rear Multiport.



Conveyor Multiport.



Front Three Multiports.

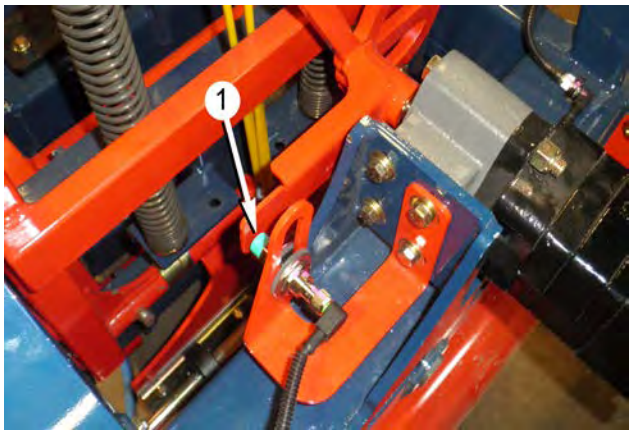


Rear Five Multiports

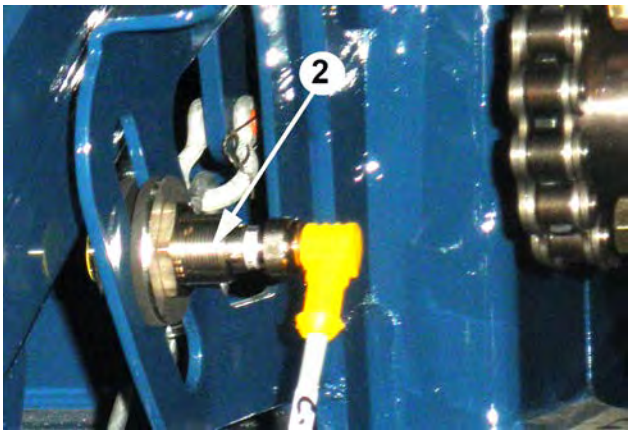
Proximity Sensors

IMPORTANT

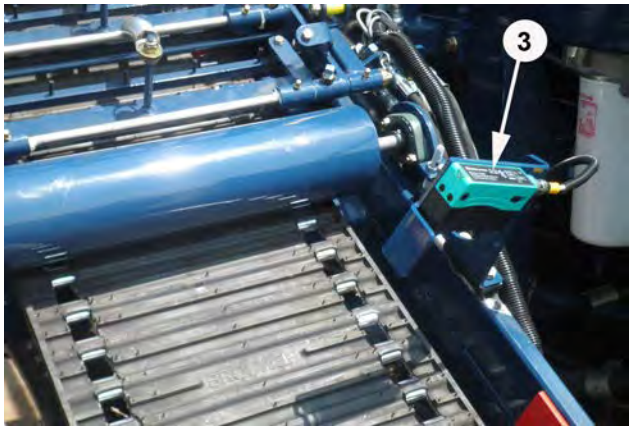
To prevent loss of signal from a Sensor it is imperative that a regular check is carried out to ensure that no dirt/debris is allowed to build up on the face of the sensor or the sensor target. If a Proximity Sensor, or the target component, is replaced it must be adjusted, where applicable, to allow a gap between the face of the sensor and the target as indicated below.



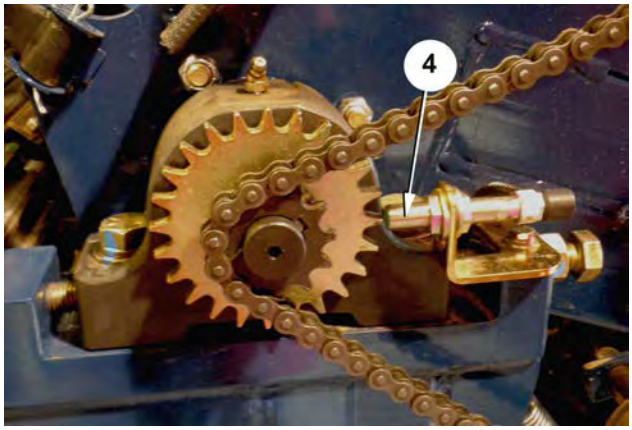
1. Cut-Off - Sensor to Target **1/4 in. to 3/8 in.**



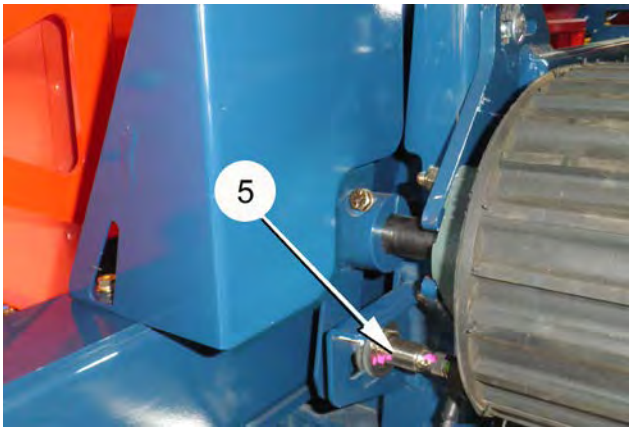
2. Conveyor 'DOWN' - Sensor to Target **1/8 in. to 1/4 in.**



3. Slab End Sensor. See P3-18 for calibration.

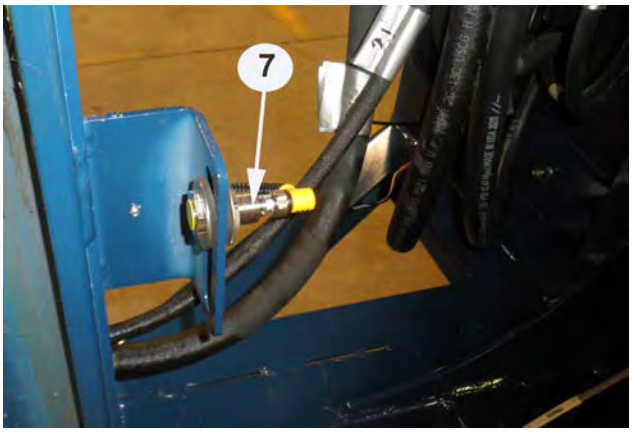


4. Roll Flap (Tooth Count) Sensor to Target **1/8 in.max**

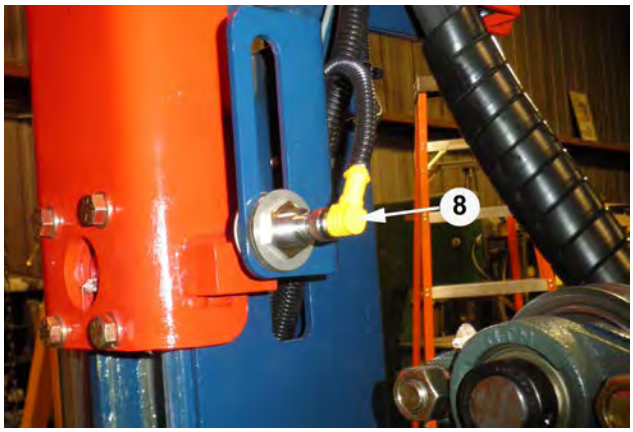


5. Index Conv'.'CLEATS' position Sensor to Target **. 1/8 in. to 1/4in**

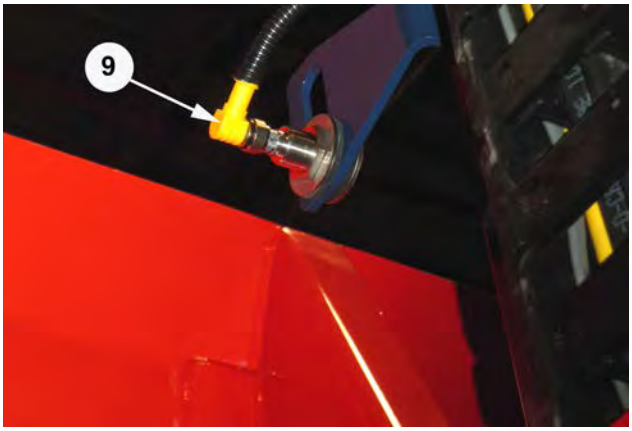
6. Mast 'Height' Sensor. No adjustment.



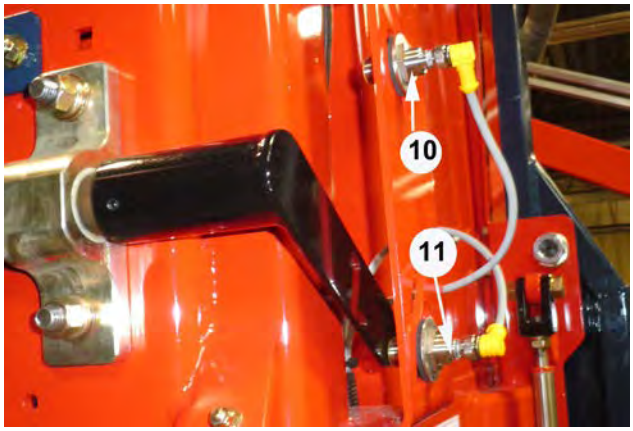
7**.** Pallet Disp'.'Bottom'. Sensor to Target **1/8in.to1/4in.**



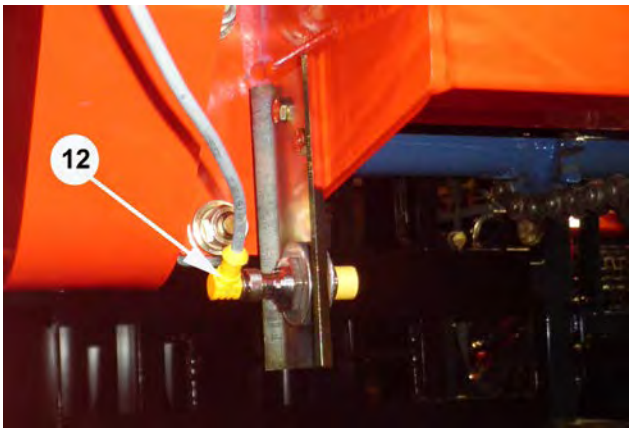
8. Pallet Disp'.'Mid.' Sensor to Target **1/8in to 1/4in.**



9. Pallet Disp'.'High'. Sensor to Target **1/8in.to1/4in.**

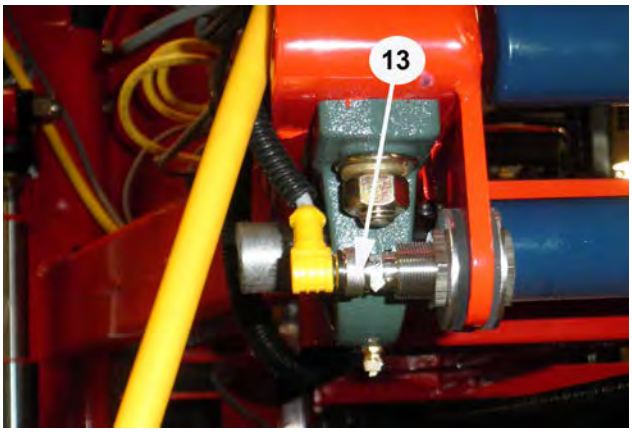


10/11.Paddles'Up-Down' Sensor to Target **1/8in. to1/4in.**



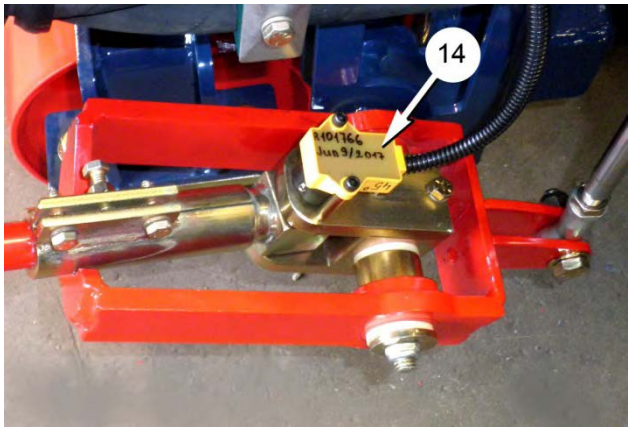
12. Push Bar 'Away' Sensor to Target **1/4in. to 3/8in.**

.

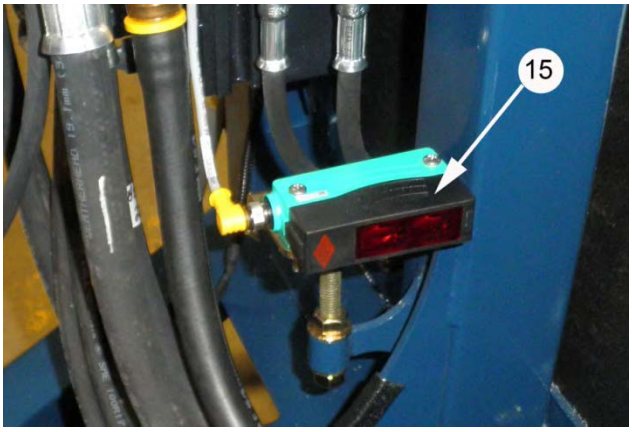


13. Push Bar 'Home'. Sensor to Target **1/8in. to1/4in.**

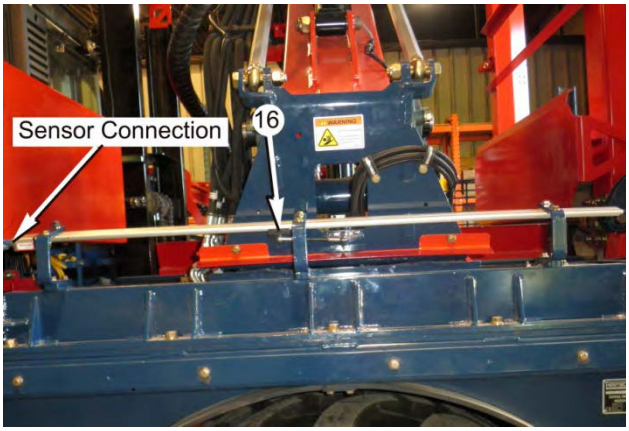
Proximity Sensors.



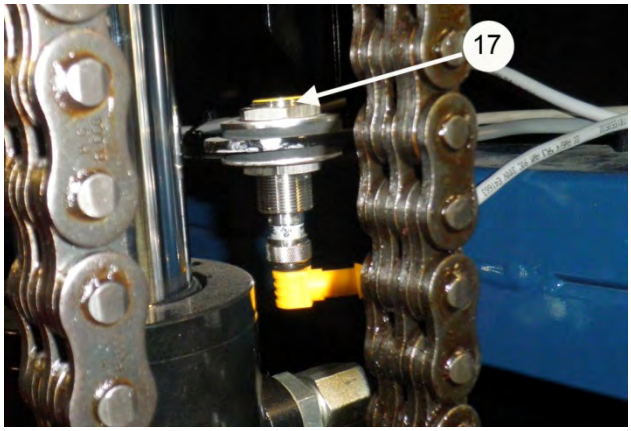
14. Ski Angle Sensor. No adjustment.



15. Pallet 'Clear' Sensor (Cover removed). No adjustment



16. Arm Rail Sensor.No adjustment.



17. Forks 'Bottom'. Sensor to Target **1/8in to 1/4in.**

IMPORTANT

Check regularly that there is no dirt or debris on the face of the sensors or between the sensors and their targets.

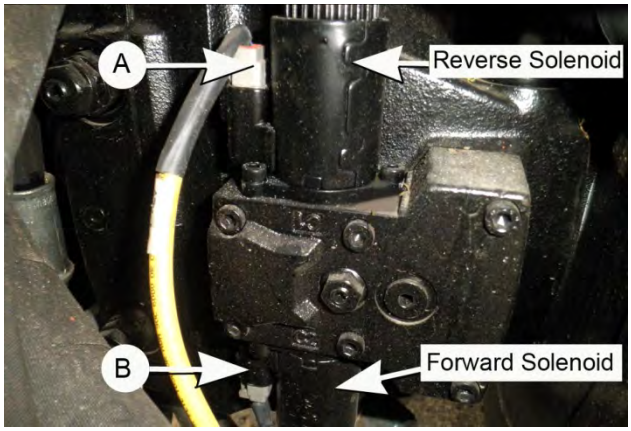
Do not direct high pressure water at any electrical components

Drive Pump (P1).
Forward – Reverse Solenoids.

The Displacement Solenoids change the internal operation of the pump to enable Forward and Reverse selection.

Top Solenoid Connector Plug '**A**' (Reverse), goes to **J4** on the front 4-Port Block.(C13).
See page 5-02 & 5-07.

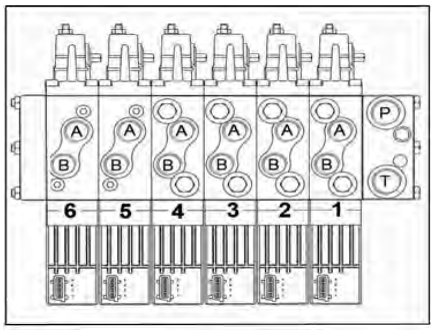
Bottom Solenoid Connector Plug '**B**' (Forward) goes to **J2** on the front 4-Port Block.(C13).
See page 5-02 & 5-07.



Drive Pump Solenoids.

6-Bank PVG Control Valves.

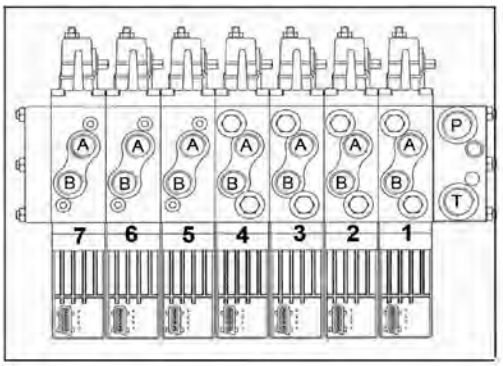
1. Oil Cooler Hyd. Motor.
2. Pallet Dispenser Cylinder.
3. Paddles Lift Cylinder.
4. Pallet Inject Motor.
5. Wall Cylinders.
6. Mast Cylinder.



6 - Bank PVG Valves.

7-Bank PVG Valves.

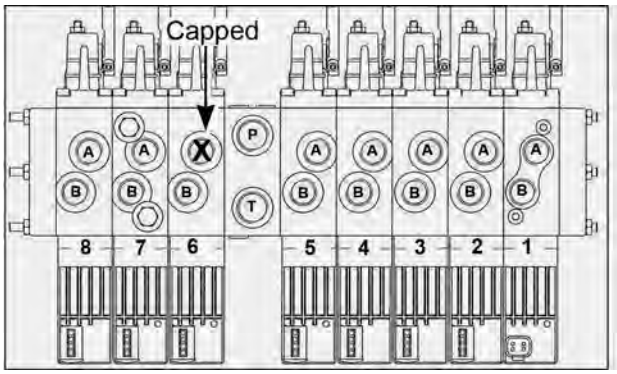
1. Arm Motor.
2. Arm Lift Cylinder.
3. Arm Reach Cylinder.
4. Gripper Head – Rotate Cylinder.
5. Multi Grip Cylinder.
6. Single Grip Cylinder.
7. Squeeze Cylinder.



7-Bank PVG Valves.

8 –Bank PVG Valves.

1. Down Pressure Cylinder.
2. Main Conveyor Lift Cylinder.
3. Depth Cylinder.
4. Roll Eject Motor.
5. Cutter Motor.
6. Main Conveyor Motor.(A-Port Capped).
7. Cut-Off Motor.
8. Index Conveyor Motor.

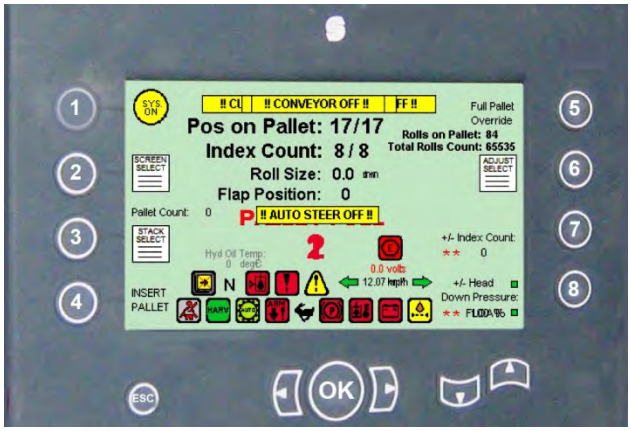


8 –Bank PVG Valves.

IMPORTANT

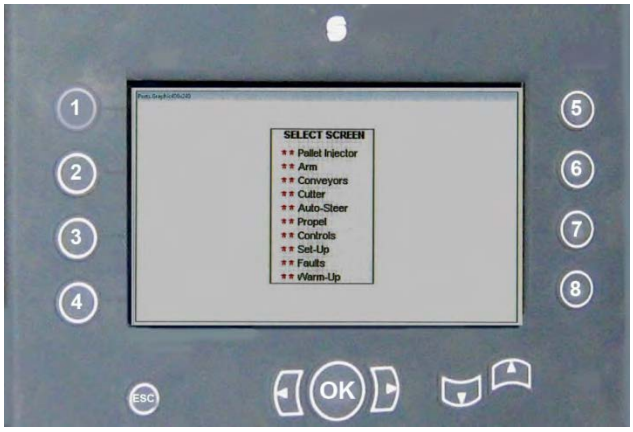
The following procedure must be followed to prevent the loss of function calibration when disconnecting the Sensor Cables on the conveyor for the : Cut-Off; Slab End; Tooth Count; Auto-Steer and Down Pressure.

- Turn the Ignition ‘ON’.
- Switch the System Power ‘ON’.
- Go to System ‘SELECT’ Screen. **PAD 2.**



Cab Display – Controller ‘A’.

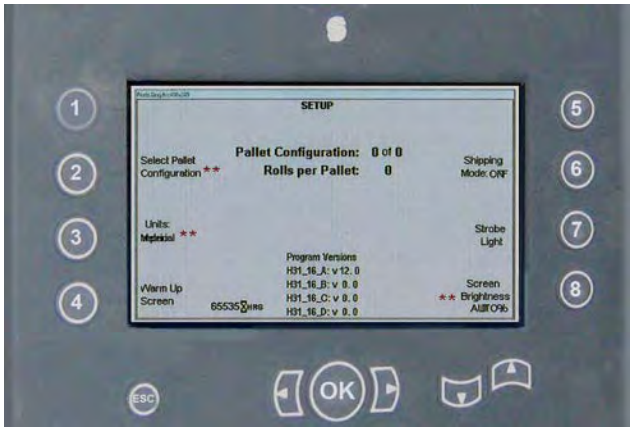
- Select ‘**SET-UP’** on Select Screen.



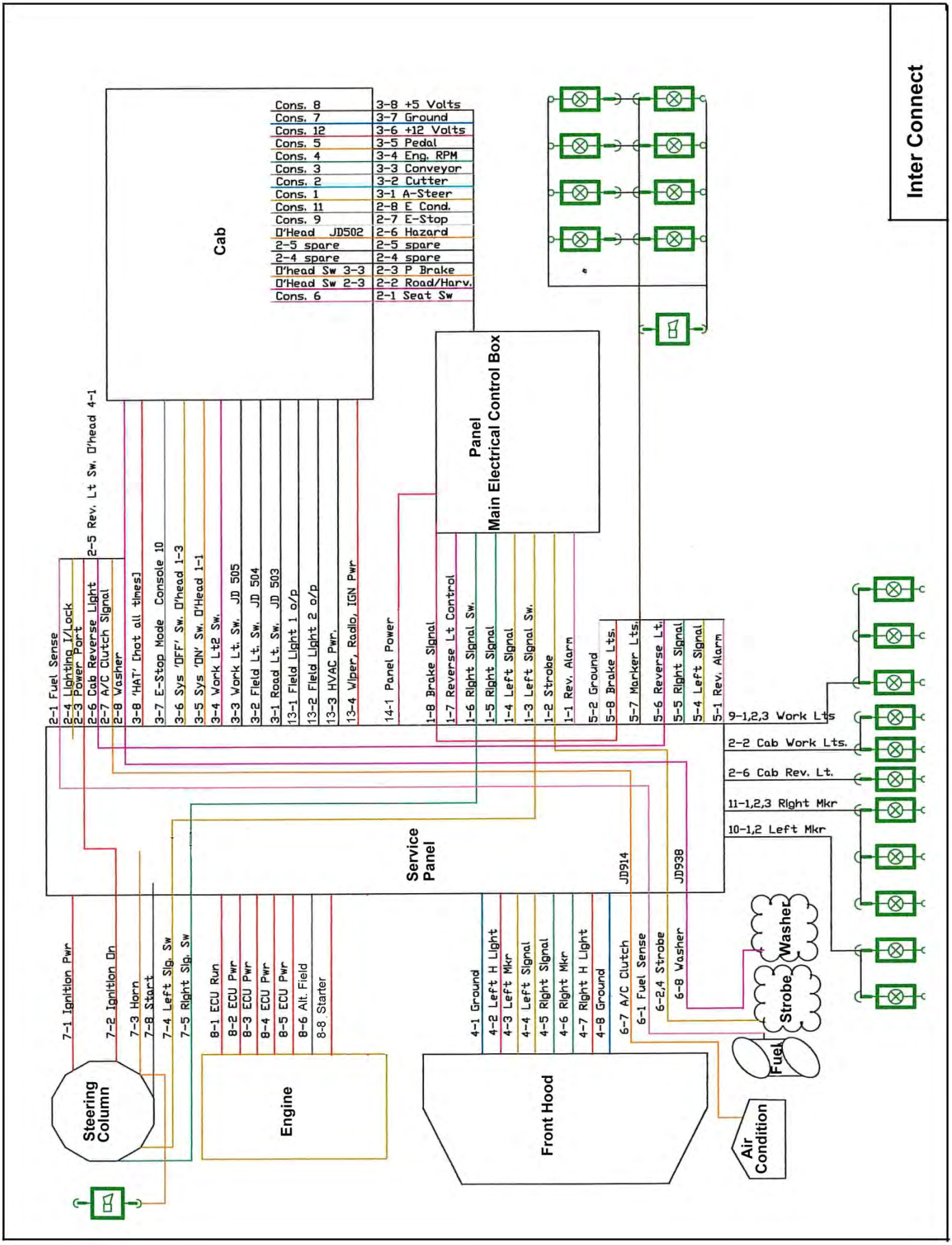
Select Screen

- Activate ‘SHIPPING MODE’. **PAD 6**.
- Disconnect the sensor cables.
- Switch the System Power ‘OFF’.
- Turn the ignition ‘OFF’.

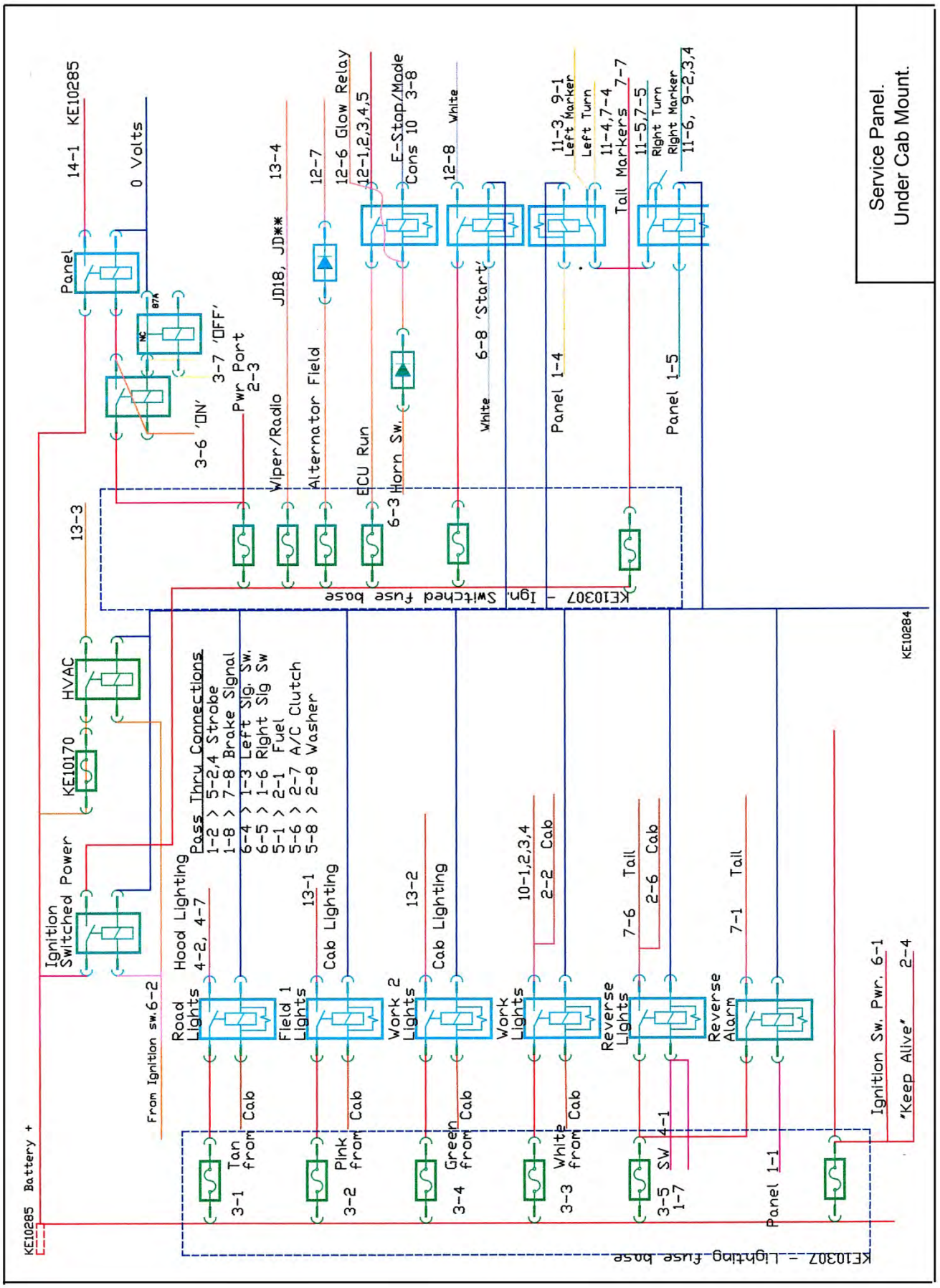
When the sensor cables are reconnected, and the system is reactivated, it will automatically return to the programmed settings.



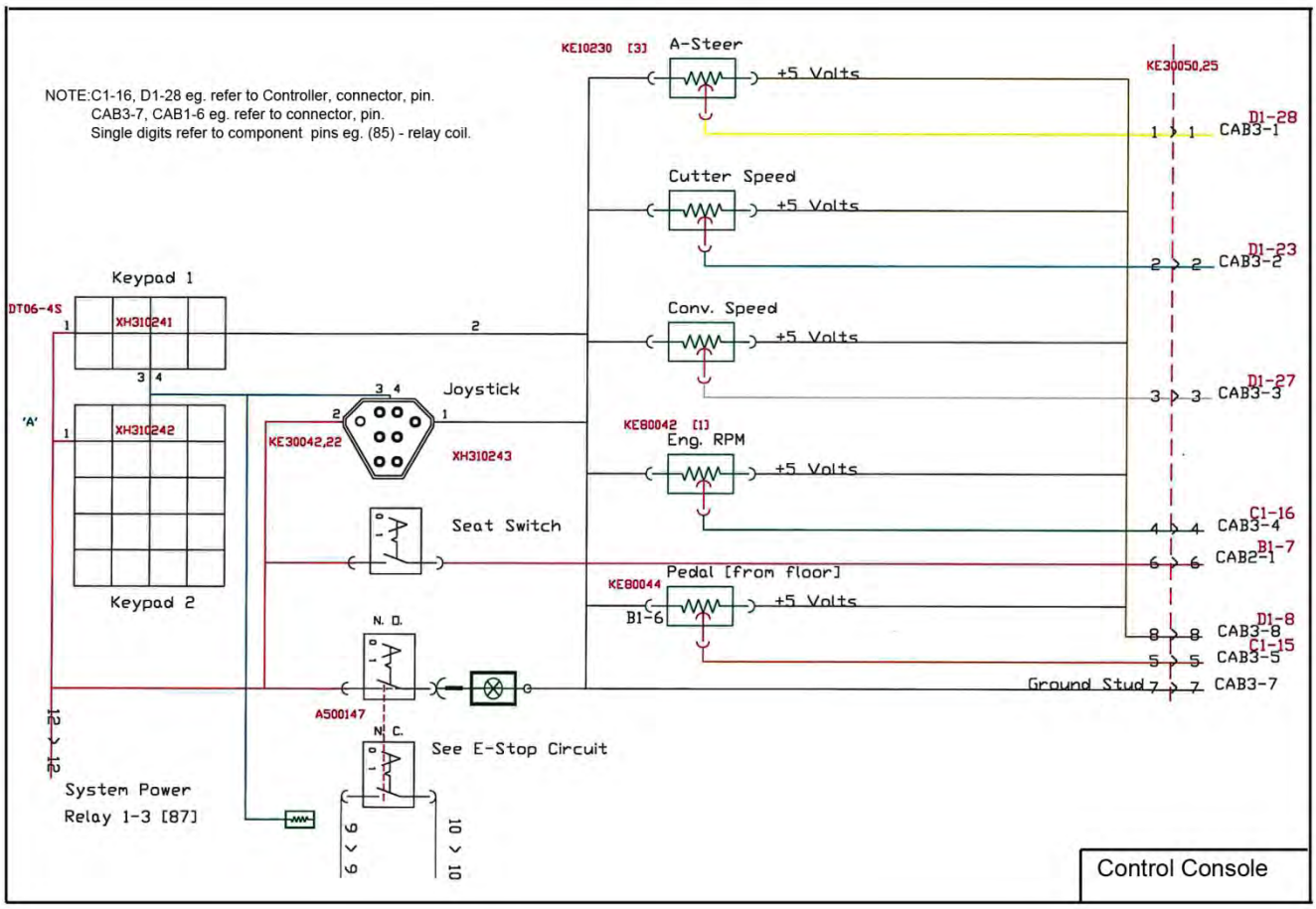
Activate Shipping Mode Screen.

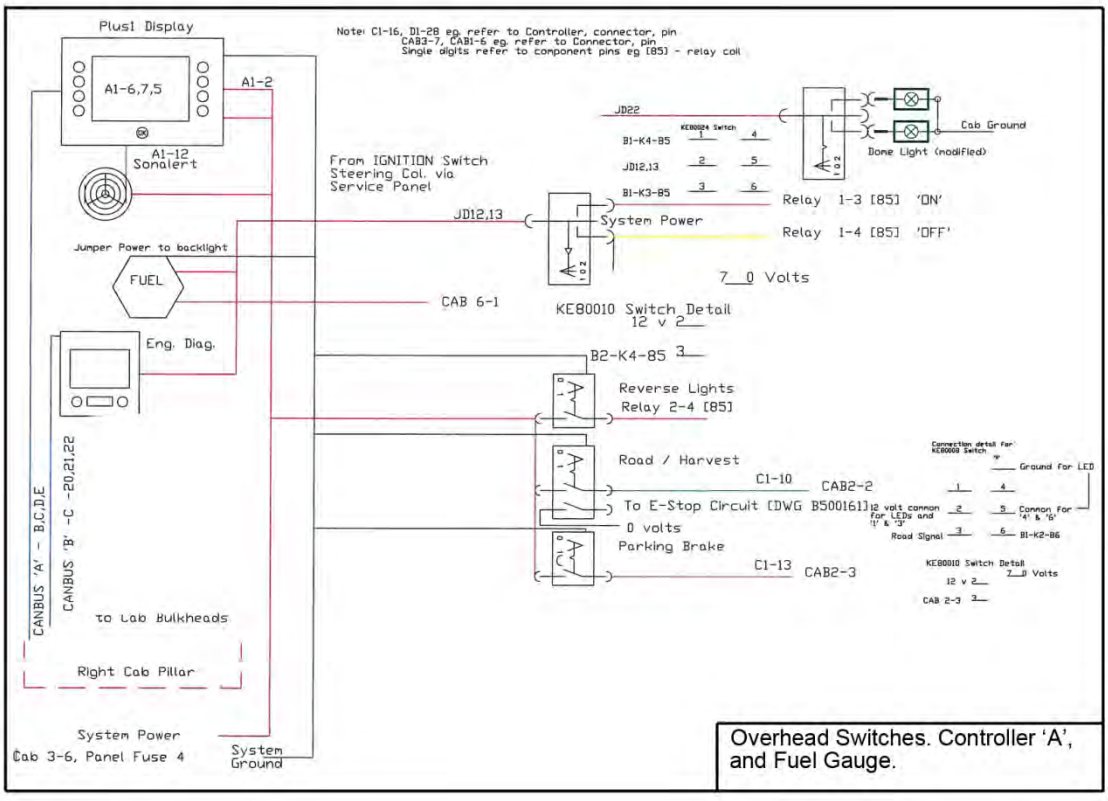

Inter Connect
Cab
Cons. 8
Cons. 7
Cons. 12
Cons. 5
Cons. 4
Cons. 3
Cons. 2
Cons. 1
Cons. 11
Cons. 9
D'Head JD502
2-5 spare
2-4 spare
D'head Sw 3-3
D'Head Sw 2-3
Cons. 6
3-8 +5 Volts
3-7 Ground
3-6 +12 Volts
3-5 Pedal
3-4 Eng. RPM
3-3 Conveyor
3-2 Cutter
3-1 A-Steer
2-8 E Cond.
2-7 E-Stop
2-6 Hazard
2-5 spare
2-4 spare
2-3 P Brake
2-2 Road/Harv.
2-1 Seat Sw
Panel
Main Electrical Control Box
2-1 Fuel Sense
2-4 Lighting T/Lock
2-3 Power Port
2-6 Cab Reverse Light
2-7 A/C Clutch Signal
2-8 Washer
2-5 Rev. Lt Sw. D'head 4-1
3-8 'HAT' (hot all times)
3-7 E-Stop Mode Console 10
3-6 Sys 'OFF' Sw. D'head 1-3
3-5 Sys 'ON' Sw. D'Head 1-1
3-4 Work Lt2 Sw.
3-3 Work Lt. Sw. JD 505
3-2 Field Lt. Sw. JD 504
3-1 Road Lt. Sw. JD 503
13-1 Field Light 1 o/p
13-2 Field Light 2 o/p
13-3 HVAC Pwr.
13-4 Wiper, Radio, IGN Pwr
14-1 Panel Power
1-8 Brake Signal
1-7 Reverse Lt Control
1-6 Right Signal Sw.
1-5 Right Signal
1-4 Left Signal
1-3 Left Signal Sw.
1-2 Strobe
1-1 Rev. Alarm
5-2 Ground
5-8 Brake Lts.
5-7 Marker Lts.
5-6 Reverse Lt.
5-5 Right Signal
5-4 Left Signal
5-1 Rev. Alarm
9-1,2,3 Work Lts
2-2 Cab Work Lts.
2-6 Cab Rev. Lt.
11-1,2,3 Right Mkr
10-1,2 Left Mkr
Service Panel
JD914
JD938
7-1 Ignition Pwr
7-2 Ignition On
7-3 Horn
7-8 Start
7-4 Left Sig. Sw
7-5 Right Sig. Sw
Steering Column
8-1 ECU Run
8-2 ECU Pwr
8-3 ECU Pwr
8-4 ECU Pwr
8-5 ECU Pwr
8-6 Alt. Field
8-8 Starter
Engine
4-1 Ground
4-2 Left H Light
4-3 Left Mkr
4-4 Left Signal
4-5 Right Signal
4-6 Right Mkr
4-7 Right H Light
4-8 Ground
6-7 A/C Clutch
6-1 Fuel Sense
6-2,4 Strobe
6-8 Washer
Front Hood
Washer
Strobe
Fuel
Air Condition

Service Panel. Under Cab Mount.

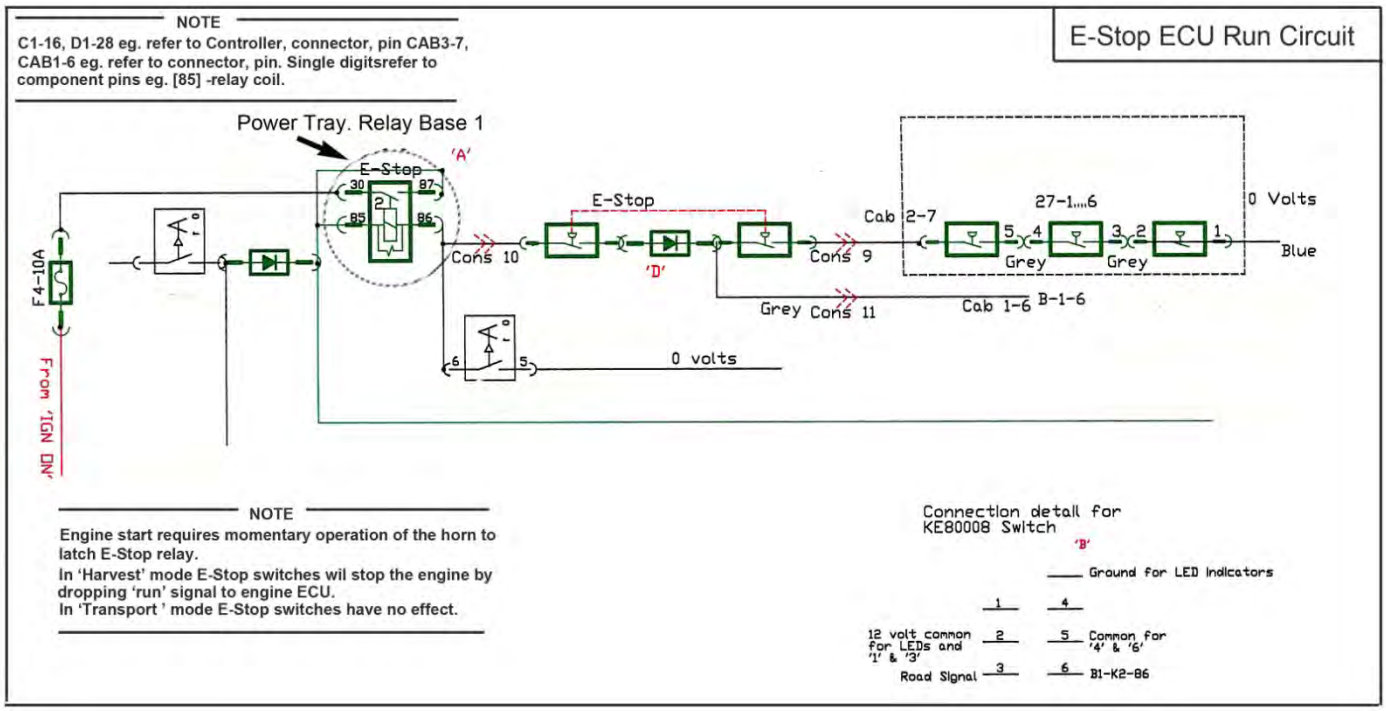


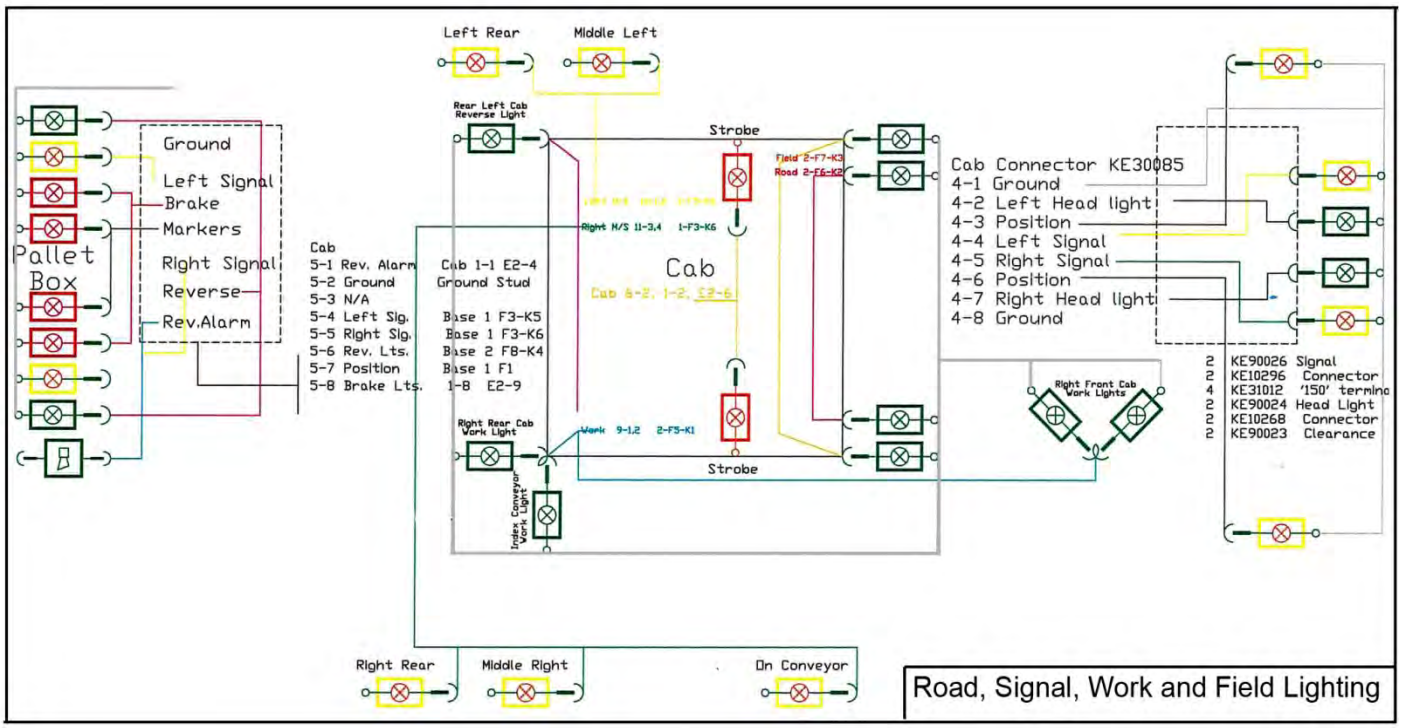
Wiring Schematics.

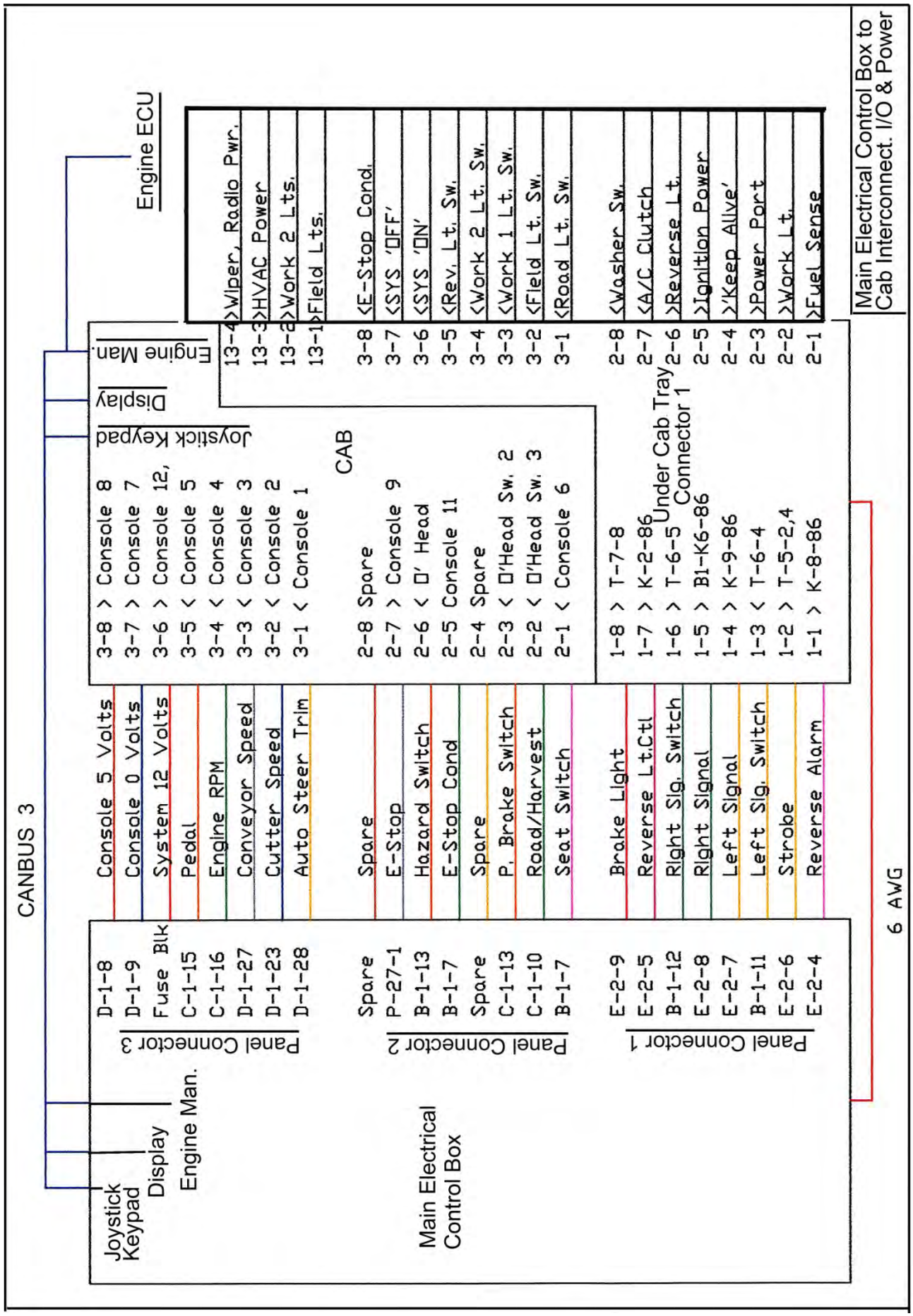


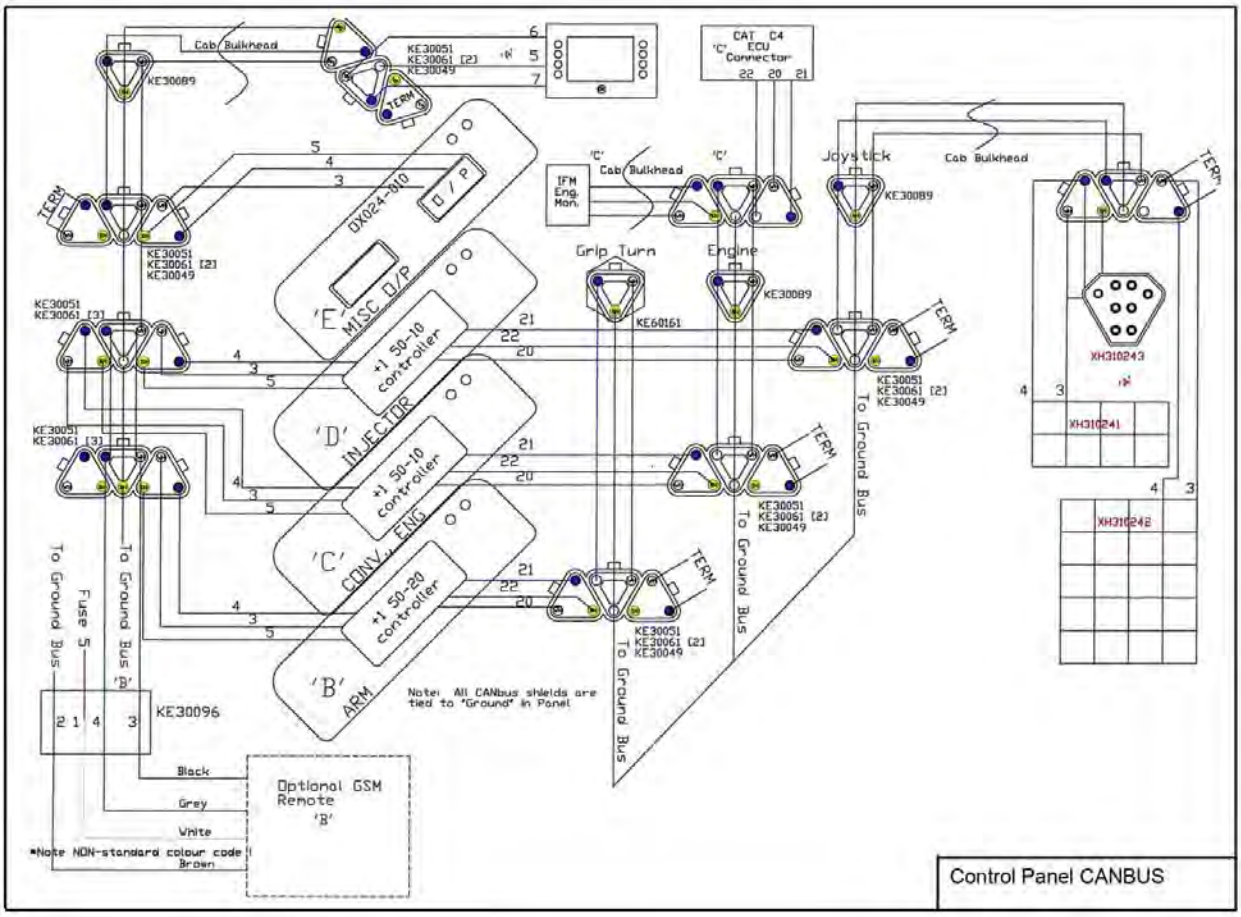


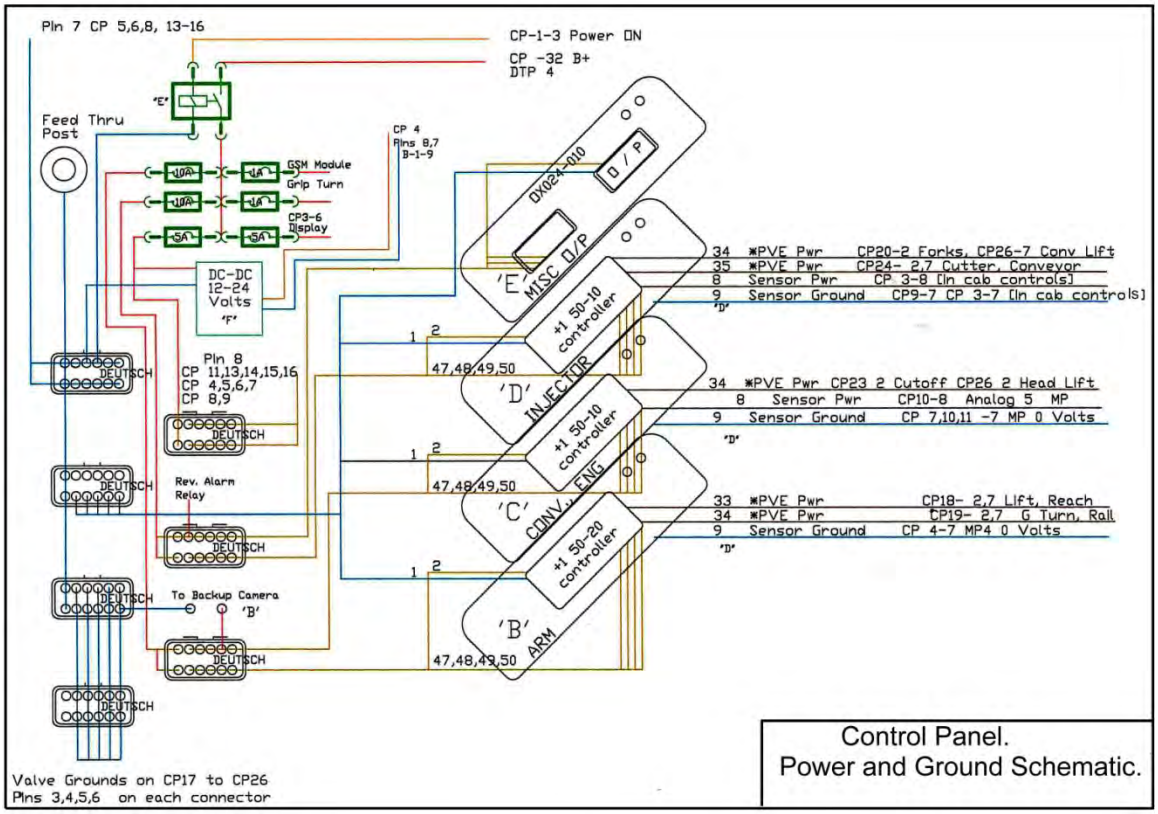
Wiring Schematics.

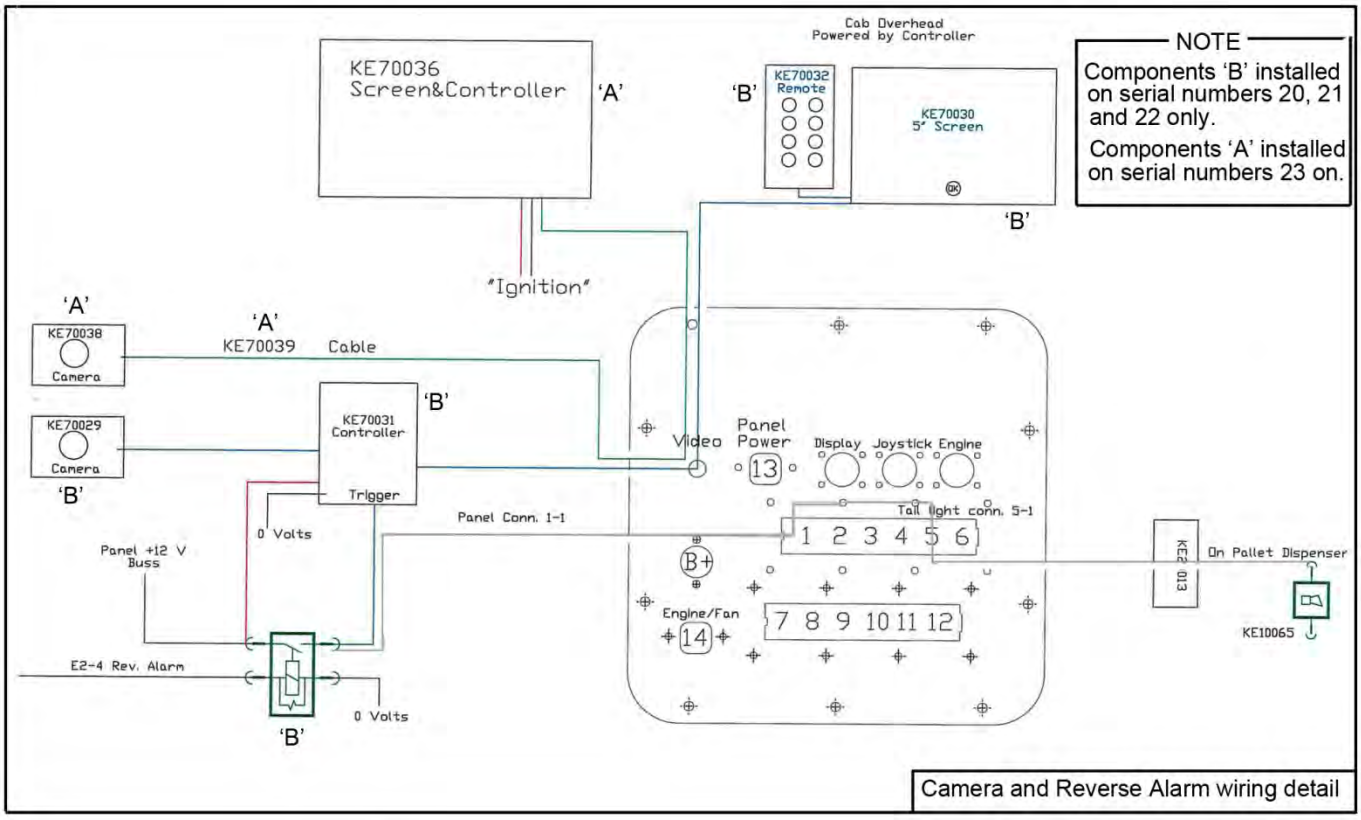


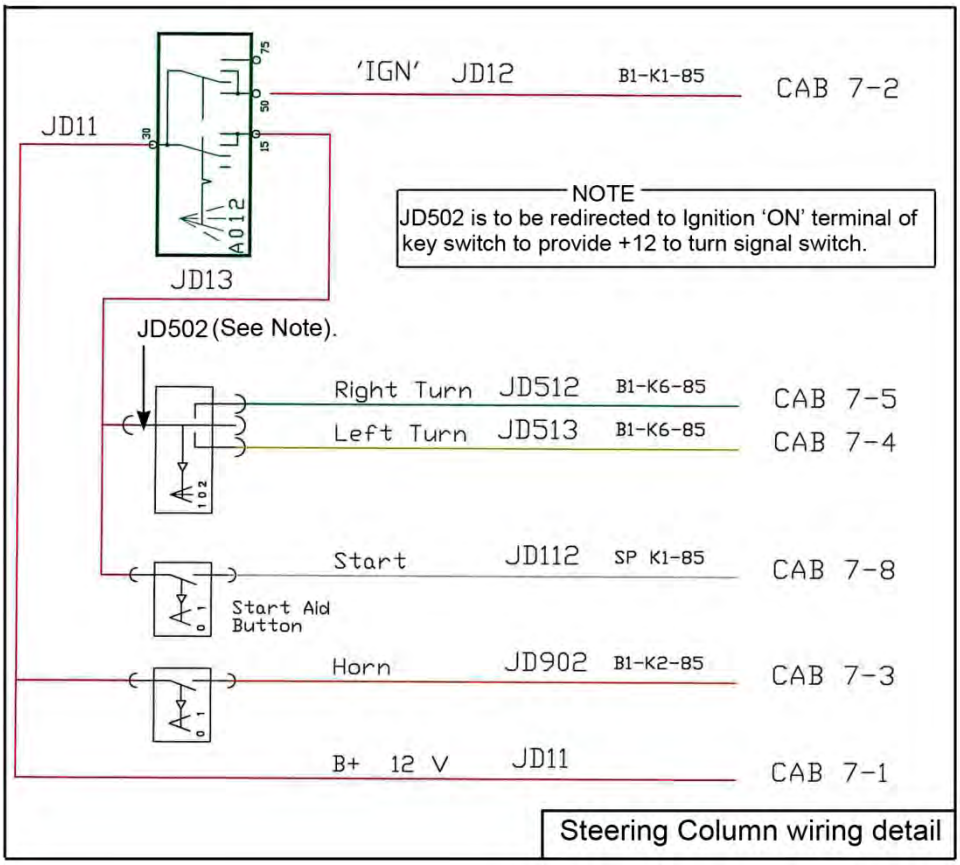



CANBUS 3
Joystick Keypad
Display
Engine Man.
Main Electrical Control Box
Panel Connector 3
D-1-8 Console 5 Volts
D-1-9 Console 0 Volts
Fuse Blk System 12 Volts
C-1-15 Pedal
C-1-16 Engine RPM
D-1-27 Conveyor Speed
D-1-23 Cutter Speed
D-1-28 Auto Steer Trim
Panel Connector 2
Spare
P-27-1 E-Stop
B-1-13 Hazard Switch
B-1-7 E-Stop Cond
Spare
C-1-13 P. Brake Switch
C-1-10 Road/Harvest
B-1-7 Seat Switch
Panel Connector 1
E-2-9 Brake Light
E-2-5 Reverse Lt.Ctl
B-1-12 Right Sig. Switch
E-2-8 Right Signal
E-2-7 Left Signal
B-1-11 Left Sig. Switch
E-2-6 Strobe
E-2-4 Reverse Alarm
6 AWG
CAB
3-8 > Console 8
3-7 > Console 7
3-6 > Console 12, Joystick Keypad
3-5 < Console 5
3-4 < Console 4
3-3 < Console 3
3-2 < Console 2
3-1 < Console 1
2-8 Spare
2-7 > Console 9
2-6 < ' Head
2-5 Console 11
2-4 Spare
2-3 < 'Head Sw. 2
2-2 < 'Head Sw. 3
2-1 < Console 6
1-8 > T-7-8
1-7 > K-2-86
1-6 > T-6-5
1-5 > B1-K6-86
1-4 > K-9-86
1-3 < T-6-4
1-2 > T-5-2,4
1-1 > K-8-86
Under Cab Tray Connector 1
Engine Man. Display
Engine ECU
13-4 >Wiper, Radio Pwr.
13-3 >HVAC Power
13-2 >Work 2 Lts.
13-1 >Field Lts.
3-8 <E-Stop Cond.
3-7 <SYS 'OFF'
3-6 <SYS 'ON'
3-5 <Rev. Lt. Sw.
3-4 <Work 2 Lt. Sw.
3-3 <Work 1 Lt. Sw.
3-2 <Field Lt. Sw.
3-1 <Road Lt. Sw.
2-8 <Washer Sw.
2-7 <A/C Clutch
2-6 >Reverse Lt.
2-5 >Ignition Power
2-4 >'Keep Alive'
2-3 >Power Port
2-2 >Work Lt.
2-1 >Fuel Sense
Main Electrical Control Box to Cab Interconnect. I/O & Power


Cab Bulkhead
KE30089
KE30051
KE30061 [2]
KE30049
TERM
CAT C4
'C' ECU
Connector
22 20 21
Joystick
Cab Bulkhead
IFM
Eng.
Man.
DX024-010
D / P
'E'
MISC D/P
'D'
INJECTOR
'C'
CONV. ENG
'B'
ARM
+1 50-10
controller
+1 50-20
controller
Grip Turn
Engine
KE60161
XH310243
XH310241
XH310242
To Ground Bus
Fuse 5
KE30096
Note: All CANbus shields are
tied to 'Ground' in Panel
Black
Grey
White
*Note NON-standard colour code !
Brown
Optional GSM
Remote
'B'
Control Panel CANBUS


Pin 7 CP 5,6,8, 13-16
CP-1-3 Power ON
CP -32 B+
DTP 4
Feed Thru
Post
CP 4
Pins 8,7
B-1-9
GSM Module
Grip Turn
CP3-6
Display
DC-DC
12-24
Volts
Pin 8
CP 11,13,14,15,16
CP 4,5,6,7
CP 8,9
DEUTSCH
Rev. Alarm
Relay
To Backup Camera
DX024-010
D / P
'E'
MISC D/P
'D'
INJECTOR
'C'
CONV. ENG
'B'
ARM
+1 50-10
controller
+1 50-20
controller
47,48,49,50
34 *PVE Pwr CP20-2 Forks, CP26-7 Conv Lift
35 *PVE Pwr CP24- 2,7 Cutter, Conveyor
8 Sensor Pwr CP 3-8 (In cab controls)
9 Sensor Ground CP9-7 CP 3-7 (In cab controls)
34 *PVE Pwr CP23 2 Cutoff CP26 2 Head Lift
8 Sensor Pwr CP10-8 Analog 5 MP
9 Sensor Ground CP 7,10,11 -7 MP 0 Volts
33 *PVE Pwr CP18- 2,7 Lift, Reach
34 *PVE Pwr CP19- 2,7 G Turn, Rail
9 Sensor Ground CP 4-7 MP4 0 Volts
Valve Grounds on CP17 to CP26
Pins 3,4,5,6 on each connector
Control Panel.
Power and Ground Schematic.


Cab Overhead
Powered by Controller
KE70036
Screen&Controller
'A'
'B'
KE70032
Remote
KE70030
5" Screen
'B'
NOTE
Components 'B' installed on serial numbers 20, 21 and 22 only.
Components 'A' installed on serial numbers 23 on.
"Ignition"
'A'
KE70038
Camera
'A'
KE70039 Cable
KE70029
Camera
'B'
KE70031
Controller
'B'
Trigger
Video
Panel
Power
13
Display Joystick Engine
Tail light conn. 5-1
1 2 3 4 5 6
Panel Conn. 1-1
0 Volts
Panel +12 V
Buss
B+
Engine/Fan
14
7 8 9 10 11 12
KE2013
On Pallet Dispenser
KE10065
E2-4 Rev. Alarm
0 Volts
'B'
Camera and Reverse Alarm wiring detail


'IGN' JD12
B1-K1-85
CAB 7-2
JD11
30
75
50
15
A012
JD13
NOTE
JD502 is to be redirected to Ignition 'ON' terminal of key switch to provide +12 to turn signal switch.
JD502 (See Note).
Right Turn JD512
B1-K6-85
CAB 7-5
Left Turn JD513
B1-K6-85
CAB 7-4
102
Start
JD112
SP K1-85
CAB 7-8
Start Aid
Button
Horn
JD902
B1-K2-85
CAB 7-3
B+ 12 V
JD11
CAB 7-1
Steering Column wiring detail

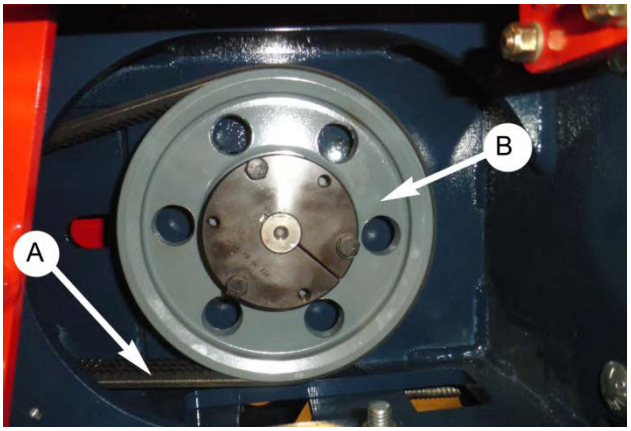
SECTION 6.

WARNING

Do not operate the machine if any safety guards are damaged or missing.
Some safety guards may have been removed for illustration purposes only.

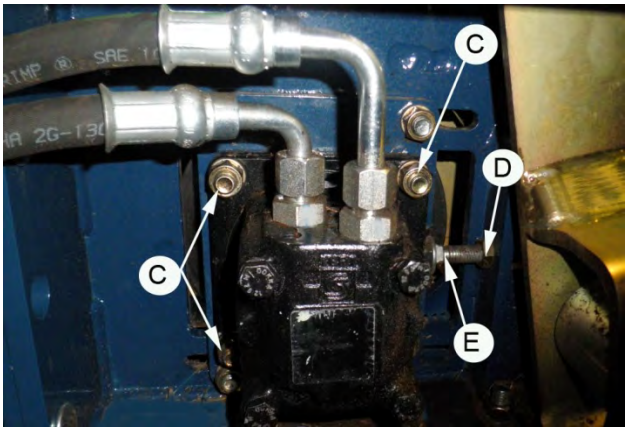
Cutter Drive Belt Adjustment.

When Correctly adjusted there should be ½ inch deflection midway between the drive and driven pulleys.
Do not over tighten the belt, as this will result in premature belt failure and possible damage to the motor and the eccentric shaft bearings.



To adjust the drive belt tension:

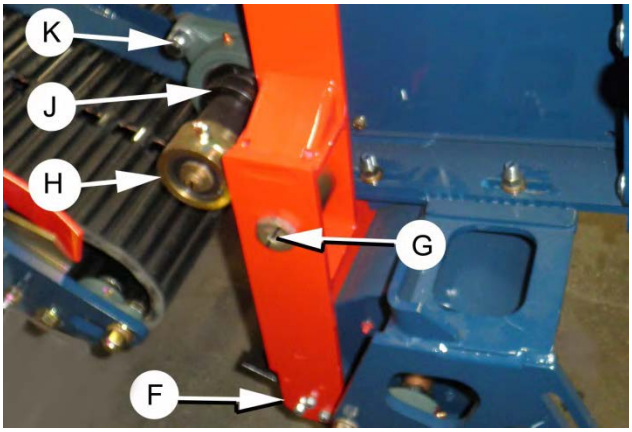
- Remove the side cover to access the drive Belt '**A**' and the Motor Sheave '**B**'.
- Loosen the Motor Mounting Bolts '**C**' and back-off the adjusting bolt Locknut '**D**'.
- Turning the Adjusting Bolt '**E**' '**OUT**' pushes the Motor forward and tightens the Belt. Turning the Adjusting Bolt '**E**' '**IN**' , away from the motor slackens the belt.
- When adjustment is complete, tighten all fasteners and replace the side cover.



Cutter Drive Belt Remove /Replace.

- Proceed as above but turn the Adjusting Bolt **'E'** fully inwards, away from the motor.
- Push the Motor back as far as possible to allow the belt to be removed from the drive pulley.
- Remove the Bolts that attach the Side Arm '**F**' to the Cutter Blade.
- Remove the Tie Bolt 'G' and push the Side Arm forward to allow the Connecting Rod '**H**' to swing down.
- Release the Bearing Lock Collar '**J**' and remove the Bearing Retaining Bolts '**K**'.
- Slide the bearing '**OUT**', toward the Connecting Rod. The self aligning bearings will allow the Eccentric Shaft to swing down sufficient to allow the belt to be removed from the Cutter Head.

Reverse the procedure to install the new Drive Belt. Adjust the Belt tension as shown above.



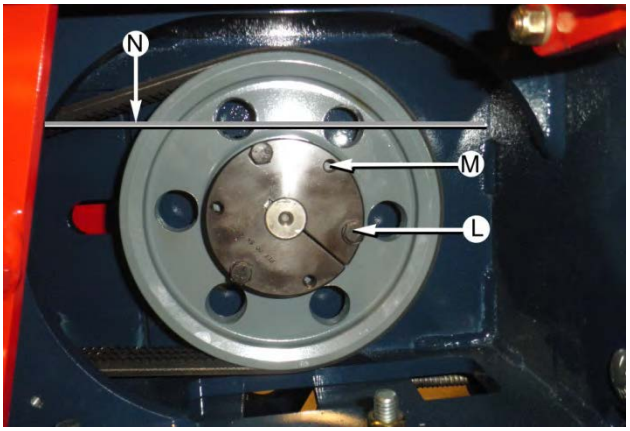
IMPORTANT

Tighten the Eccentric Shaft Bearings bolts to **300 ft.lbs.**

Remove the Cutter Drive Motor.

- Slacken the Drive Belt as shown above.
- Remove the hydraulic fittings from Motor. Note to which 'ports' the hoses connect.
- Remove three bolts '**L**' from Taper Bushing.
- Screw the three Bolts 'L' into the three threaded holes '**M**'. Tighten the bolts to release the Bushing. Remove the Pulley.
- Remove the motor mounting bolts and lift the Motor from the frame.

Reverse the procedure to install the new motor. Adjust the belt tension as shown above.



IMPORTANT

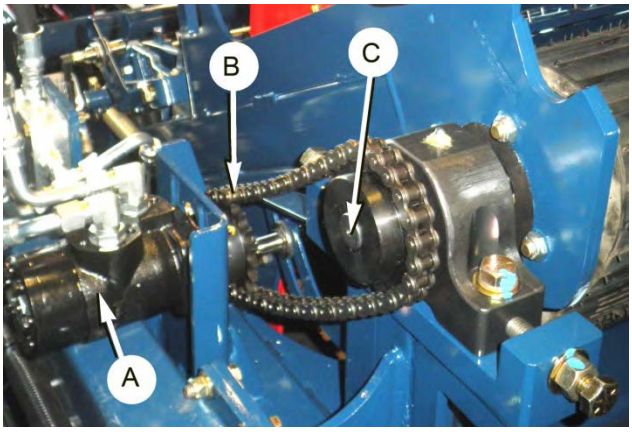
The Motor Pulley **must be aligned** with the Eccentric Shaft Pulley. Use a Straight Edge '**N**', positioned across the faces of the pulleys as shown.

Main Conveyor Mat.

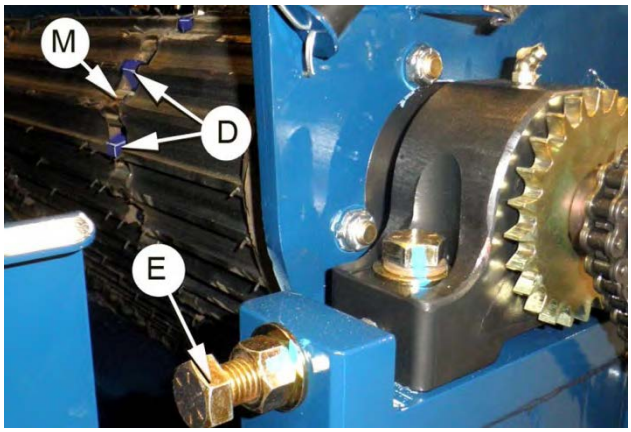
The Rubber Conveyor Mat has proven to work well in a variety of conditions. It is the preferred choice of most sod growers.
See page 6-03 for the installation of a new mat.

The Mat Drive is by Hydraulic Motor '**A**' via Chain and Sprockets '**B**' to Conveyor Drive Shaft '**C**'.

The Mat Drive Sprockets '**D**' run in slots in the mat.
The slots have replaceable Metal Clips 'M'.
See page6-03 for Clip Replacement procedure.



To prevent premature/excessive wear the mat sprockets must be 'centered' in the mat slots.
The 'tracking ' of the mat square to the conveyor frame is determined by the Crown Roller, see below.
The Mat Drive Shaft Alignment Bolts '**E**', on both sides of the conveyor frame, are set at the factory, and should not require adjustment. (See page 6-04).

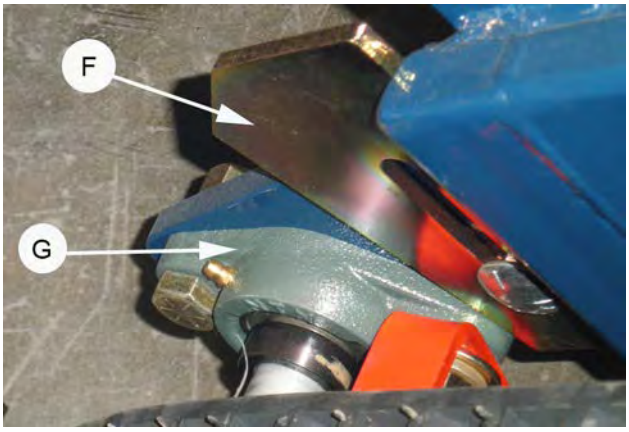


Crown Roller.

The Crown Roller, at the bottom end of the conveyor, keeps the mat 'tracking' square on the conveyor.
The Roller Shaft is aligned in the frame with Taper Wedges '**F**', located at each Roller Shaft Bearing '**G**'.
See the following pages for the correct alignment procedure.

IMPORTANT

The Crown Roller must be set so that the sod guide bracket does not hit against the conveyor mat.
Initially position the Roller shaft at the mid-point of adjustment, determined by the backstroke of the cutter blade and with allowance for the thickness of the mat.
Also allow for some forward movement of the assembly during final alignment.

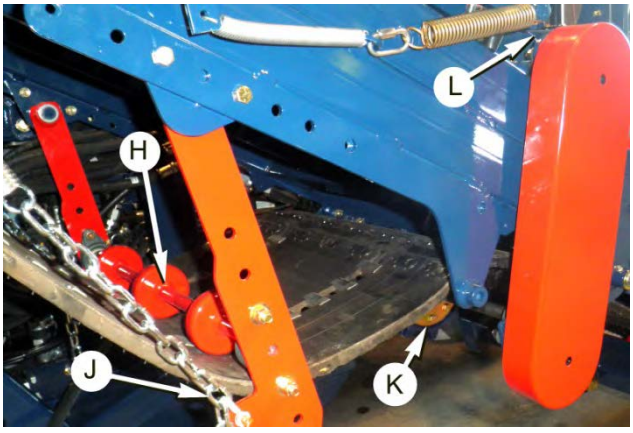


Mat Tension Idler.

Tension on the Conveyor mat is maintained by adjustable Tension Idlers 'H'.
Chains on the Idler Arms '**J**' are attached to tension springs.
Move the chain links to adjust the tension.

IMPORTANT

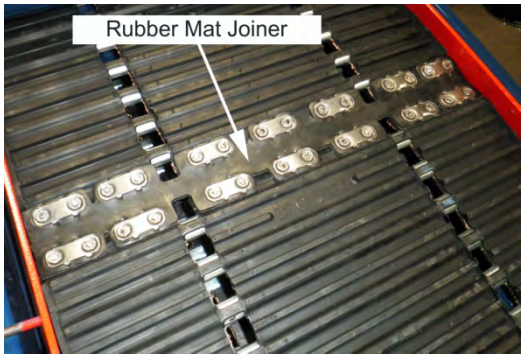
Do not allow the idler arm to approach an angle of 90 degrees to the frame as it will be pulled over center and mat tension will be lost.



Mat Support. 4 inch Roller Drive.

The Mid-Idler Shaft Sprockets Assembly supports the mat.
The Sprockets '**K**' drive the 4 inch Feed Roller '**L**'.

Main Conveyor Mat.

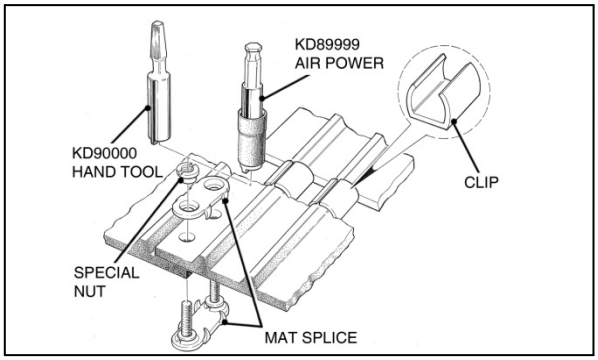


The Conveyor Mat halves are joined together with rubber joiners. This method eliminates the mat ends having to be overlapped and results in a flat mat join.
Metal Mat Splices are still used.

When installing a new mat or new mat sliders a mat join kit must be used. The rubber joiner and metal splices cannot be reused. Refer to the parts manual for kit number

Special tools are available for easy removal and Installation of the mat splices. See below.

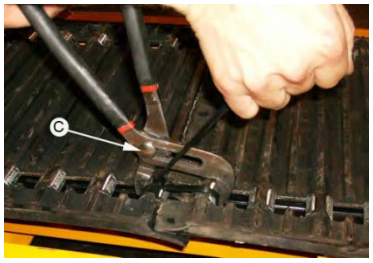
Index Conveyor Mat.



The Index Conveyor mat is joined with Metal Splices.
The mat halves must be joined overlapped as shown.

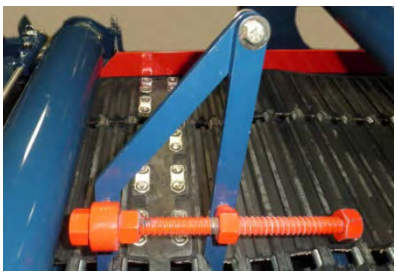
It is important that the excess portion of the threaded stud Is broken off above the nut

The special tools allow easy removal and installation of the splices.
KD90000 for use with hand tool.
KD89999 for use with air power.



When installing the new mat use expanding grips ‘C’ to pull the mat ends together, while securing them with zip ties, until the splices have been fitted.

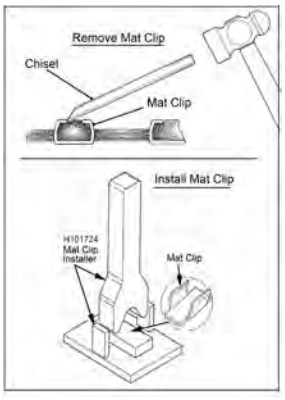
NOTE: A Special Tool is available for mat installation, as Shown. Part No. S500002



Special Tool. S500002.

WARNING

Do not operate the Conveyor until the Stud Ends have been broken off.
Failure to observe this precaution may result in serious injury to the operator, and/or damage to the machine.



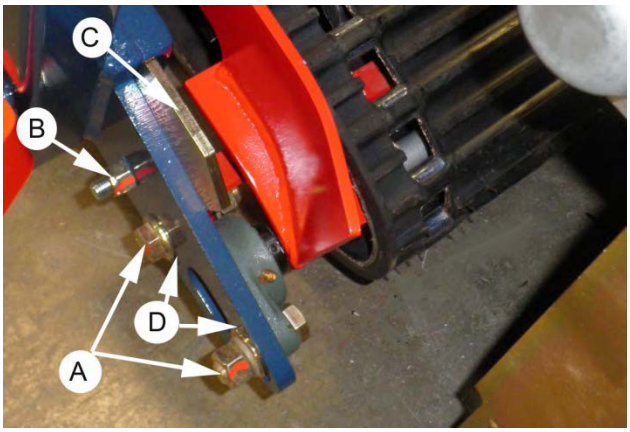
Mat Clip –Remove/Fit

Mat Clips.
The Metal Mat Clips will wear and need replacing.
Use a chisel or similar tool to open them up for removal.

A Special Tool (Part No. H101724) is available to make installation fast and safe.

Conveyor Mat Installation.

After installing the Conveyor Mat it must be aligned to run 'parallel' in the frame by adjusting the Crown Roller.

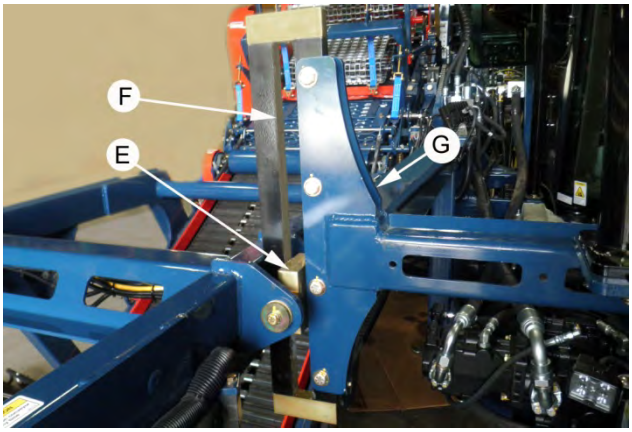


Crown Roller Alignment.

CAUTION

Adjustments **must be done by two people.** One to operate the controls, the second one to make adjustments.

- Loosen the Bearing Bolts '**A**' and the Adjusting Wedge Bolts '**B**'. Adjust the Wedges '**C**', until the Bearing Bolts are positioned in the center of the Adjusting Slots '**D**'. (on both sides of the frame). To allow for final adjustment do not fully tighten the fasteners.
- Run the Conveyor at **LOW SPEED.**
- Observe if the mat tracks to the '**left**' (inner side of the frame), tap the '**right side'** Adjusting Wedge '**down**'.
- If the mat tracks '**right**' (to outer side of the frame), tap the '**left side'** Adjusting Wedge '**down**'.
- Adjust the Wedges '**C**', until the Mat runs parallel to the frame.
- Stop the Conveyor.
- Set the Roller Scraper 1/32 in. from the Crown Roller.
- Tighten all fasteners.

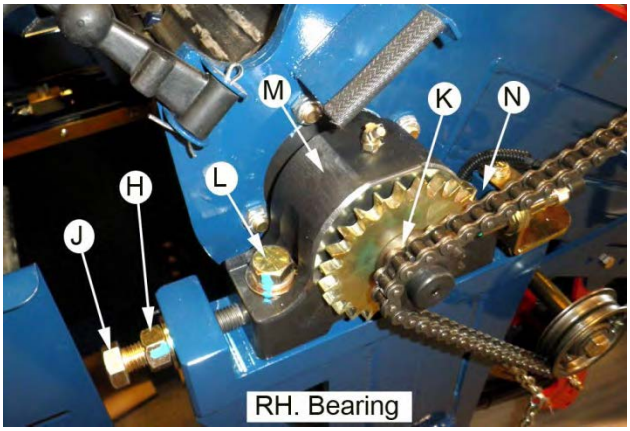


Main Conveyor Tracking.

The Conveyor is maintained parallel to the Main Frame by the Conveyor Top Bearings '**M**', and also the Tracking Retainer Plate '**E**', in the Tracking Guide Assembly '**F**', bolted to the Bracket '**G**' on the main frame.

NOTE

This is set-up at the factory and should not need adjusting, except if the Conveyor is removed for service, or if damage occurs.

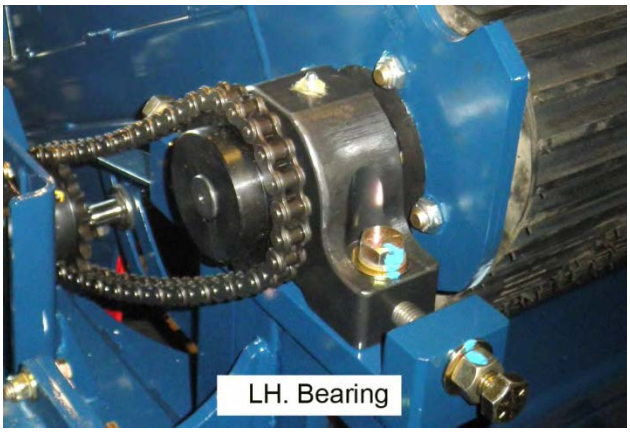


Conveyor Drive Shaft Bearings.

To install new bearings:

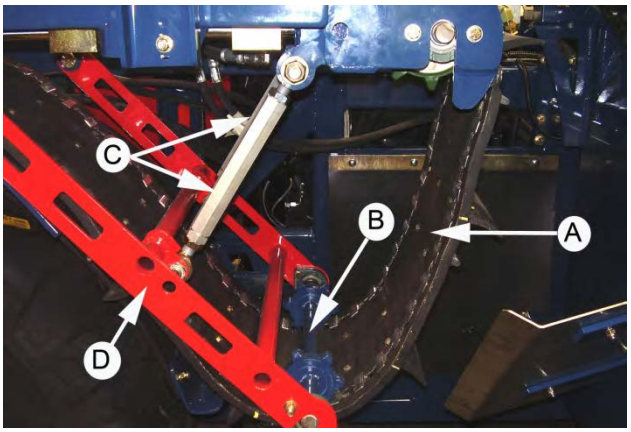
Always replace conveyor shaft bearings **on both sides**. Procedure is similar for each bearing.

- Raise the Cutter Head just clear of the ground.
- Loosen Locknut '**H**'. Back-off Bolt '**J**' until it is ***just clear* of the Bearing 'M'.**
- Back-off the set screw in the Drive Sprocket '**K**'. Remove the chain drive sprocket and tooth count sprocket. Do not misplace the Key.
- Remove Bolts '**L**' and the Bearing '**M**'.
- Install the new bearings, hard against front adjusting bolt 'N', and ***just clear*** of rear adjuster Bolt '**J**'. Tighten the Bearing Bolts '**L**'.
- Tighten the Bolts '**J**', until they are hard against the Bearings, and tighten the Locknuts '**H**'.
- Re-install the Sprockets and Chain.



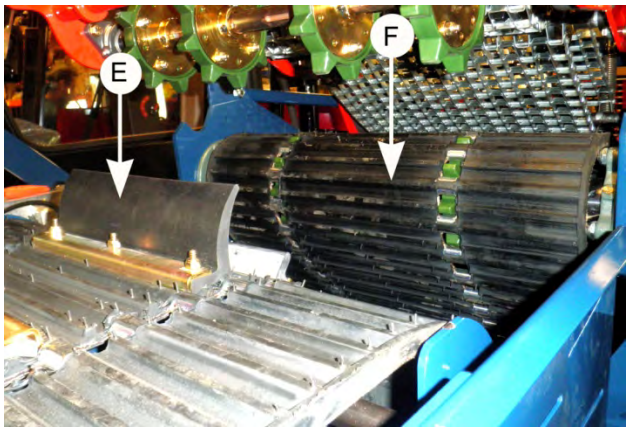
Index Conveyor Mat.

The Index Conveyor Mat has Metal Splices joining the mat and Metal Clips in the sprocket holes.. Refer to P6-03 for service instructions.



The Mat '**A**' is tensioned with a Sprocket Shaft '**B**' that is attached to the Pivot Arms '**D**'.
The Pivot Arms '**D**' must be adjusted equally with the Links '**C**' to ensure that the Sprocket Shaft is level with the conveyor frame.

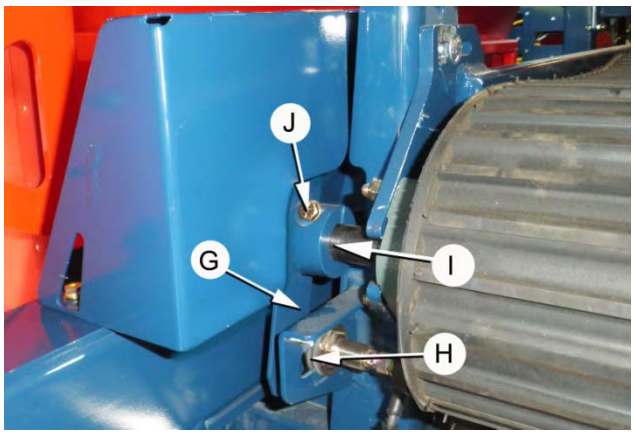
The correct position of the Roll Cleats '**E'** relative to the Main Conveyor '**F**' ensures that the sod rolls drop onto the Index Conveyor **between the Roll Cleats.**



The position of the Roll Cleats is determined by the position of the Sensor Flag '**G**' relative to the Sensor '**H**'.

IMPORTANT

When adjusting the Sensor Flag start with it **'centered'** on the face of the Sensor, then proceed to rotate it in **small increments** until the correct Roll Cleat position is obtained.



To adjust the Conveyor Cleats position:

NOTE: CW & CCW as viewed from arrow **'I'**

- Loosen the clamp bolt '**J**' in the Sensor Flag boss.
- Rotate the Sensor Flag '**G**' '**clockwise**' to move the cleats '**forward**'.
- Rotate the Sensor Flag '**G**' '**counter clockwise**' to move the cleats '**rearwards**'.
- Tighten the clamp bolt '**J**'.

IMPORTANT

When adjusting the Sensor Flag, the gap between the Sensor Flag and the face of the Sensor '**H**' must be set at **1/8in to 1/4in.**

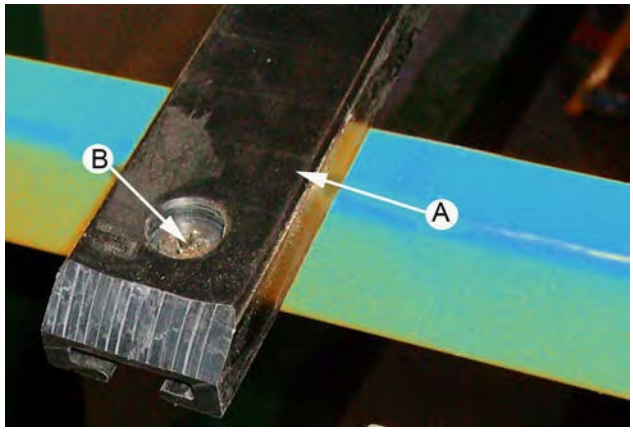
To replace any worn or damaged Roll Cleats remove the Clamp Bar '**K**'.

.

Conveyor Mat Sliders.

Service life of Conveyor Sliders varies depending on the soil conditions.
Inspect them for excessive wear, particularly under the Roll-up Tray, when replacing the Mat and at major service.

The Sliders '**A,**' fit onto 'T-Section' Rails and are fastened at the lower end with Flat Head S.S. Screws '**B**' and Locknuts. Excessive wear will be evident when the frame rails show through the Sliders.
Wear thickness, **3/8 inch**, is less than the overall thickness.

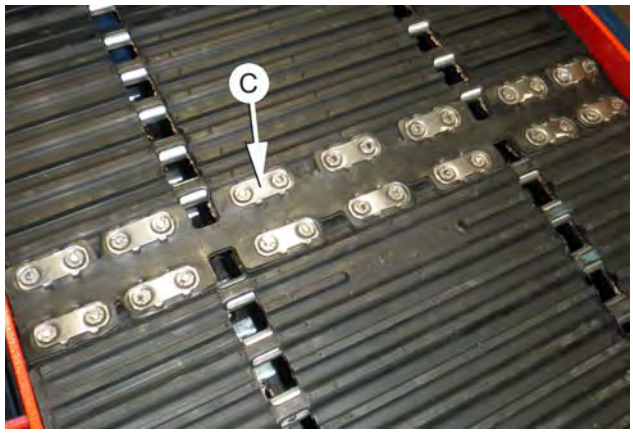


Remove/Replace Upper Slides.

- Locate a join in the Mat and position it at the mid-point of the Conveyor Frame.
- Remove the Idler Tension Springs,see page 6-02.
- Remove the Mat Splices and Rubber Joiner '**C**'.

  See page 6-03 reference replacement kit.

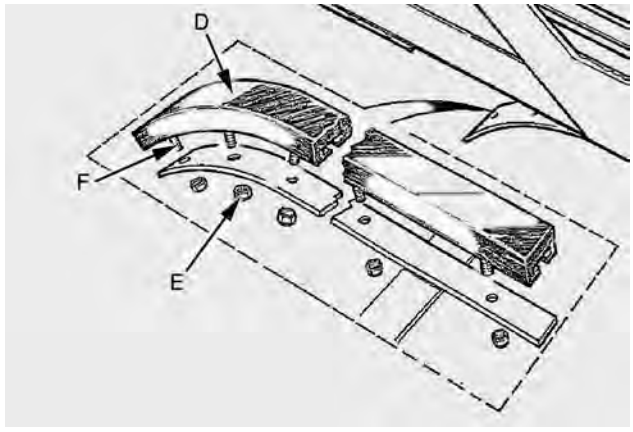
- Pull the Mat clear of the top Drive Sprockets and off the bottom front Crown Roller.
- Remove the Screws and Locknuts fastening the Sliders to the frame rails, and pull the Sliders up and off the Rails. It may be easier and quicker to cut badly worn Sliders off the Rails. Clean up the rails for easier fitting of the new sliders.
- Feed the Slider onto the rail, from the top. 'Knock' it down the rail until the bottom fasteners can be fitted.
  Always replace the Sliders as a set.



Lower Sliders.

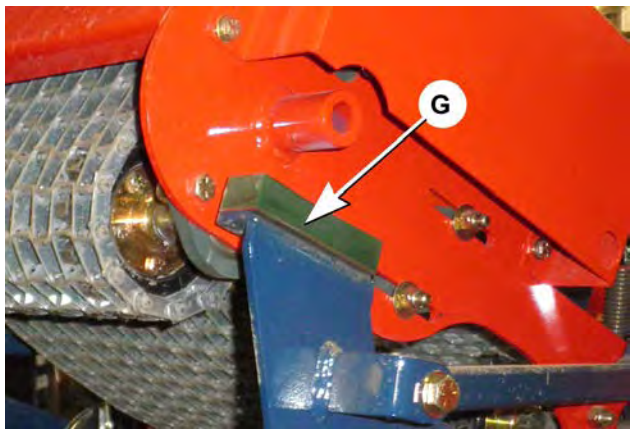
To replace the Lower Mat Sliders **'D'** :

- Remove the Locknuts **'E',** and lift the Sliders off the rails
- Remove 'T-Bolts' '**F**', from the Sliders and fit them into the new Sliders, and bolt them into place.

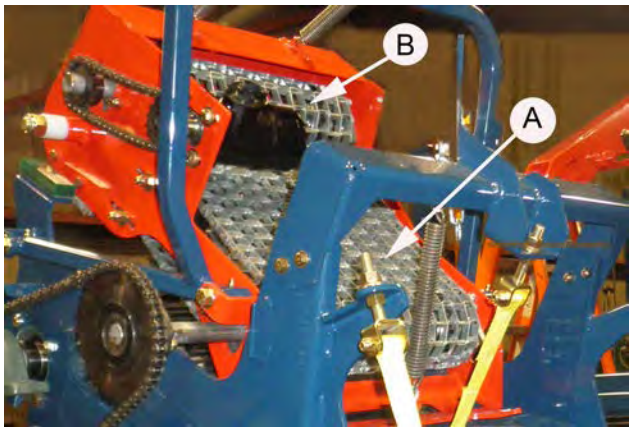


Roll-up Conveyor Bump Stops.
The Roll-up Conveyor is a Mintex Metal Mat.
See page 6-07 for details on the Mintex Mats.

- Roll-up Conveyor Bump Stops '**G**', are attached on both sides of the Frame.
- Replace badly worn or damaged Bump Stops.



Mintex Metal Mats. Roll-Up and Roll Eject.



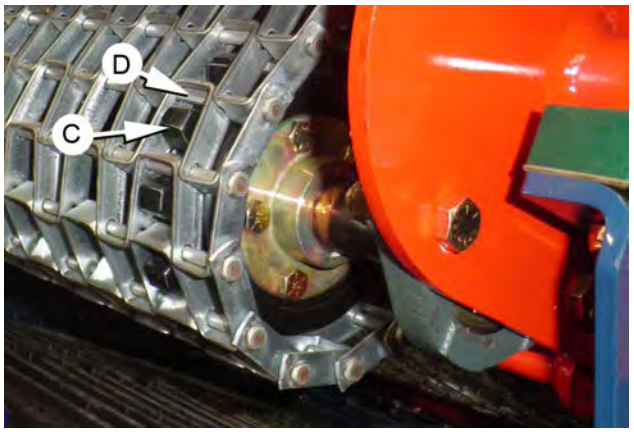
Roll-Up Mat '**A**'. and Eject Mat '**B**'.
Replace complete Mats as there are no replacement parts.
To ensure a long service life, it is important that the Mat Drive and Driven Shafts, are parallel to each other and set 'square' in the Frame.

NOTE

The links, at the outer edge of the Mat must point 'opposite' to the direction of mat travel.

Mat Drive Sprockets.

- The Sprockets are keyed to the shaft and locked with Set Screws.
- The teeth of the Drive Sprockets '**C**' **must** contact the Mat Connectors '**D**'.
- Sprocket Teeth **must be centered** in the Mat openings. If the Teeth contact the side face of the Links it will result in excessive and premature wear to the Sprockets and the Mat, and early failure of the Mat.

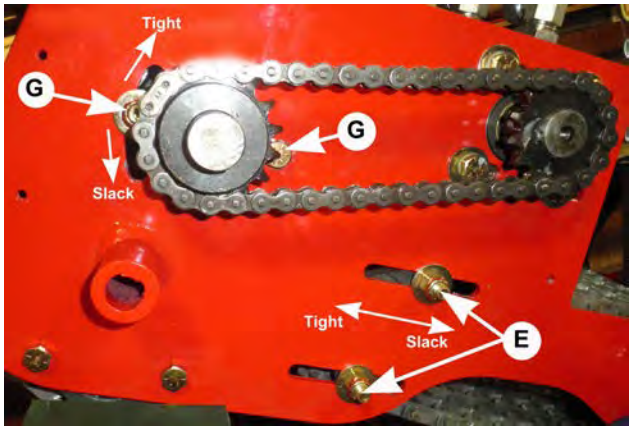


Idler Sprockets.

The Idler Sprockets also are keyed and locked with Set Screws. They are positioned one inch closer to the center of the mat than the Drive Sprockets.

NOTE

If the Sprocket Teeth show excessive wear, it is recommended that the Roll-Up Frame Assembly be removed for complete overhaul.

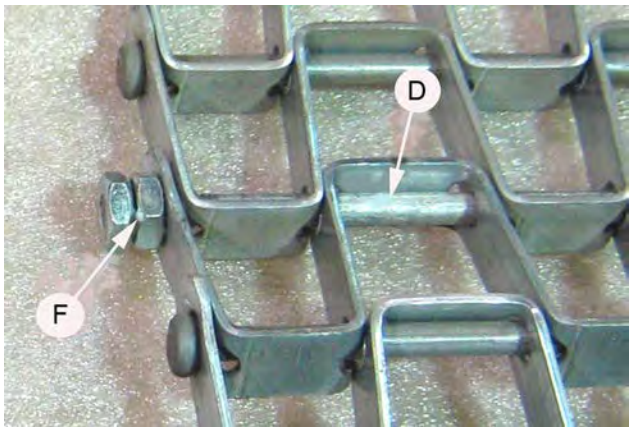


To replace the Roll-Up Mat 'A'.

- Loosen the Bearing Bolts '**E**', (both sides). Push the bearings 'forward' to slacken the mat.
- Locate the Removable Mat Connector '**D**', remove the two Jam Nuts '**F.**' Pull the Connector out and remove the mat from the Frame.
- Install the new Mat in reverse order.
- Tighten the Mat by pushing the Bearings back in the Slots in the frame. To ensure that the shaft is square in the frame, measure that the bearings are in the slots 'equally' on both sides of the frame,

IMPORTANT

To prevent premature and excessive wear **do not over tension the Mats.** They should be just 'snug tight'.



To replace the Roll Eject Mat 'B'.

- Loosen the Drive Shaft Bearing Bolts '**G'.** (Both Sides).
- Push the shaft 'down' in the slots, to slacken the mat.
- Remove the Locknuts 'F', Mat Connector '**D**' and remove the Mat.
- Install the new Mat. Push the Bearings 'up' in the slots 'equally' on both sides, to tension the Mat, and tighten the Bearing Bolts.

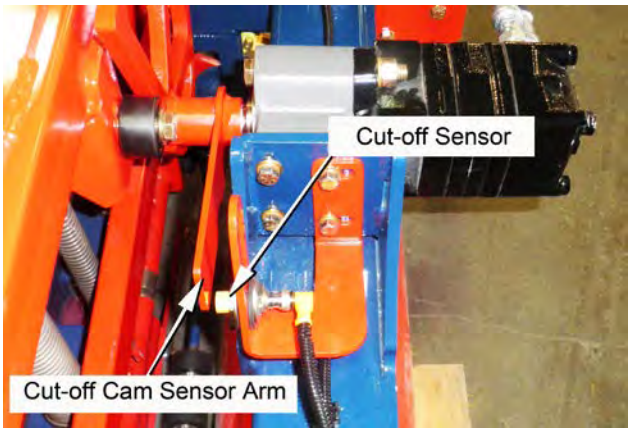
Cut Length of Sod

The Cut-Off Sensor and the programmed 'cut length', determine the length of cut. Maximum cut length of sod is 80 inches. This can be adjusted, to suit sod conditions, to a minimum of 60 inches.

IMPORTANT

If the Cut-off Sensor is remove / replaced it must be adjusted to allow 1/4in.to 3/8 in. clearance to the face of the Cut-off Cam Sensor Arm.

See Section 2 for length of cut adjustment.

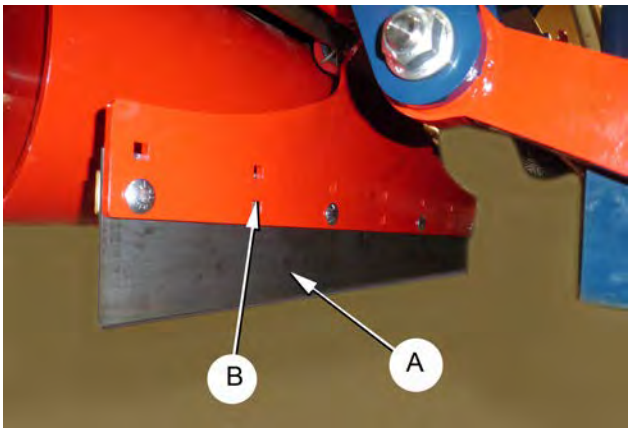


Cut-Off Blade.

It is essential that the Cut-Off Blade '**A**', is kept 'sharp'. As the blade wears, and also when it is sharpened, its depth will be reduced.
To compensate for loss of blade depth, holes in the Blade Holder '**B**', allow for adjustment.

The 'bungee' Tensioner '**C**', attached to a hook on the Blade Holder, positions the blade vertically but allows it to pivot forward when cutting.

Check that the edge of the Cut-Off Blade Mount does not hit the sod on the 'down' stroke, as this will damage the sod and cause problems when the sod is laid.



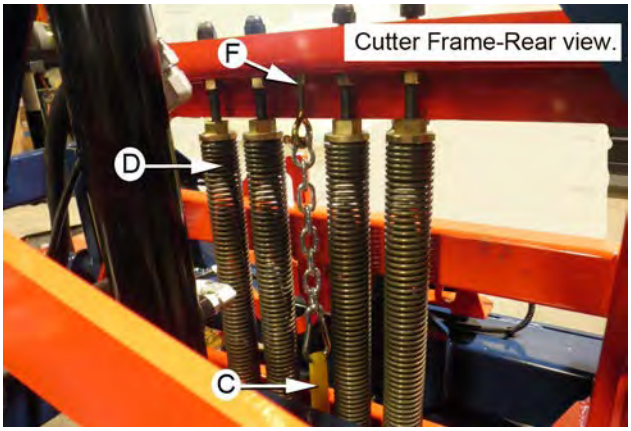
NOTE

A 'serrated' blade is available for use in soft soil, or excessive thatch. This blade will give a cleaner more positive cut in these conditions.

Cut-Off Springs.

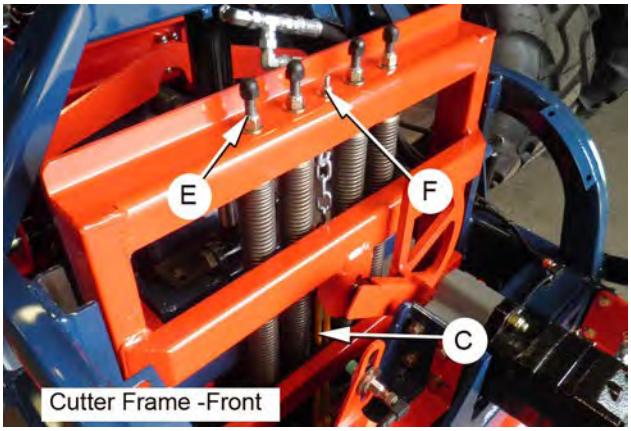
The Cut-Off Springs '**D**', are adjustable. If the spring tension needs to changed , to suit sod conditions , adjust **each spring equally,** using Adjusters '**E**'.

Adjust the 'bungee' Tensioner '**C**', using Adjuster '**F**', the same amount as on the cut-off springs.



The Cut-Off Blade depth should only be deep enough to give a clean cut, whatever thickness of sod is being cut

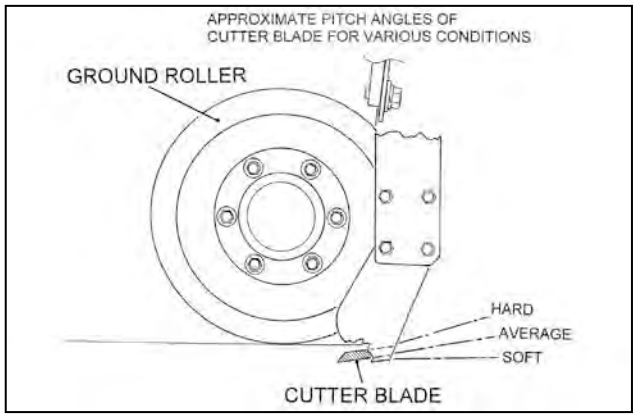
.



ADJUSTMENTS

Pitch Angle.

Pitch Angle is the angle that the Cutter Blade makes relative to the ground. It is set at the factory for 'average' turf conditions. Adjustment is provided to improve cutting performance, in soft or in hard soils.
In soft conditions the Pitch Angle should put the Cutter Blade almost parallel to the ground.
In harder soils the Pitch Angle should be increased to maintain the correct cutting angle and to prevent the Cutter Blade from coming out of the ground.



NOTE

The set-up of the Cutter Blade to the Conveyor Mat and the Ground Roller is important.
An 'extreme' Pitch Angle may require the Ground Roller to be adjusted, to maintain the recommended clearance between the Roller and the Cutter Blade.
Refer to the Ground Roller Adjustment below.

Pitch Angle Setting.

- Loosen the Lock-bolts '**A**', in the Adjuster Bracket '**B**'
- Remove the Locator Bolts '**C**'.
- To set the Pitch Angle for 'Hard' Soil : Pull the Adjuster Bracket '**FORWARD**' to '**increase**' the Cutter Blade Angle.
- To set the Pitch Angle for 'soft' Soil : Push the Adjuster Bracket '**REARWARDS**' to '**decrease**' the Cutter Blade angle.

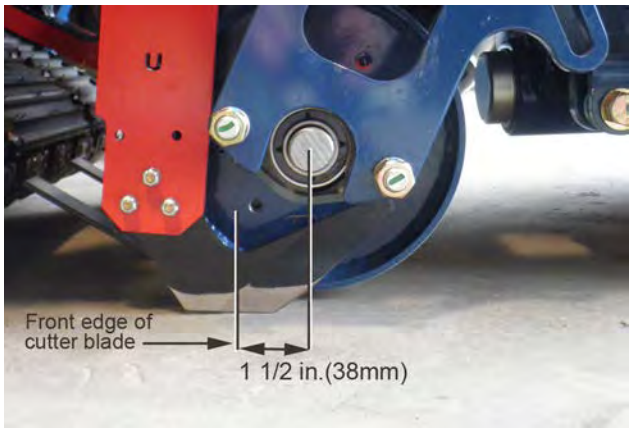
IMPORTANT

The original Depth Adjustment Holes in the Adjuster Bracket **must be used** when replacing the Locator Bolts.

- Re-fit and tighten the Locator Bolts '**C**'.
- Retighten the Lock-bolts '**A**'.

Ground Roller to Cutter Blade Setting.

The Ground Roller compresses the turf ahead of the Cutter Blade.
For average conditions the Roller to Cutter Blade setting is 1 ½ inches. This is measured, with the Cutter Blade at its '**full forward**' stroke position, from the center-line of the Ground Roller to the Cutter Blade.



Adjustment is made for various soils to maintain a quality cut.
For example:

- Peat/Muck Soils – Adjust to less than 1½ inches.
- Stoney Ground – Adjust to 2 to 2 ¼ inches.

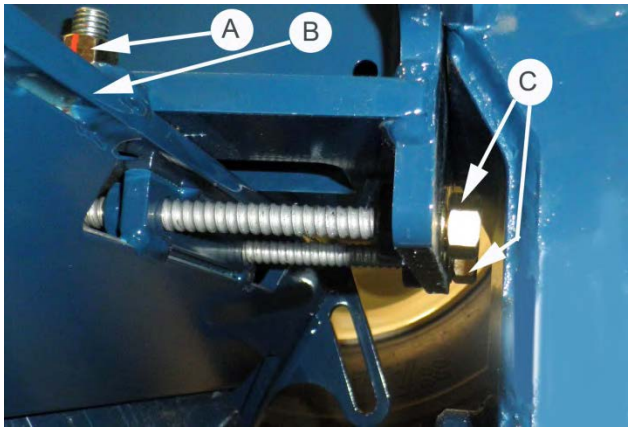
See page 6-10 for adjustment procedure.

Ground Roller Adjustment.

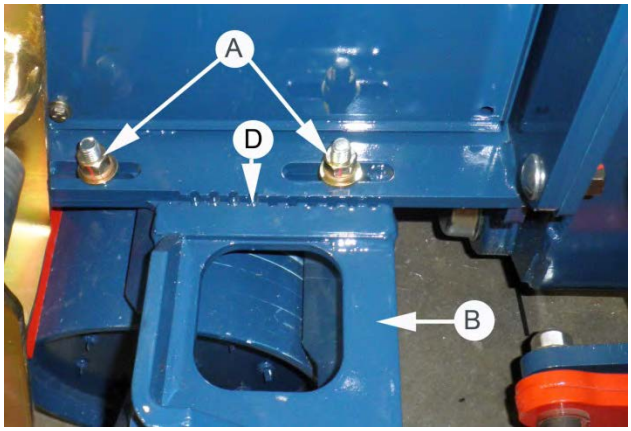
To adjust the clearance between the Ground Roller and the Cutting Blade :

- Loosen the four Locknuts '**A**', sufficient to allow the Roller Bracket '**B**', to 'slide' freely.
- Turn the Adjusting Bolts '**C',** '**clockwise**' to **reduce** the Roller to Blade clearance.
- Turn the Adjusting Bolt '**C**' '**counterclockwise**' to **increase** the Roller to Blade clearance.

- To ensure that the Roller Bracket is 'square' to the Frame, turn the Adjusting Bolts 'evenly' on both sides of the frame. Check that the 'notches' '**D**', in the Roller Bracket and those in the Frame are aligned equally, on both sides.
- Fully tighten the Locknuts.
- To prevent dirt build-up on the Roller, adjust the Roller Scraper, to 1/32 in. clear of the Roller.

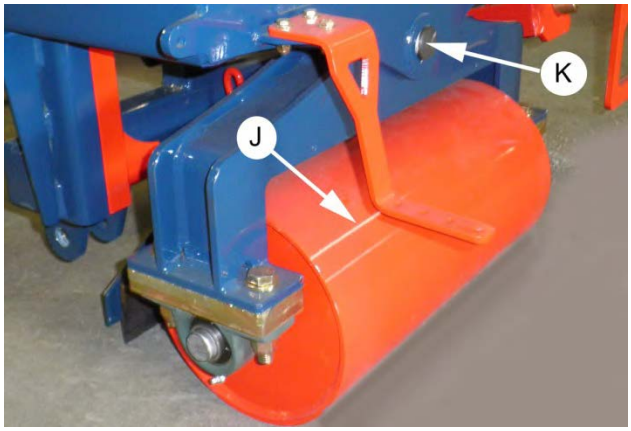


Pivoting Front Roller.
The Front Roller '**J**' pivots in bearing '**K**'. The 'polygon' bearing does not require lubrication.
Lubricate the Roller Support Bearings. See page 6-12.



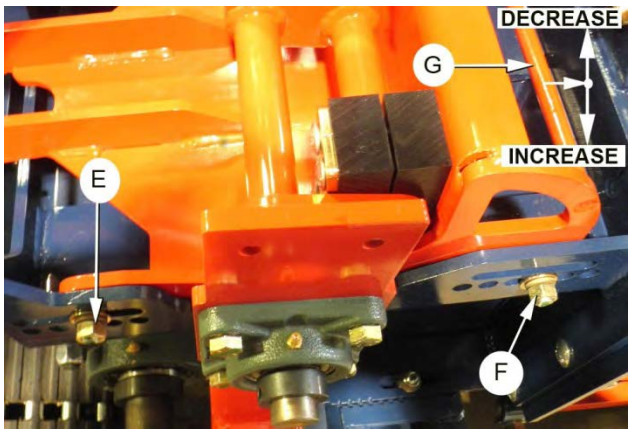
Depth of Cut.

During operation the Depth of Cut is controlled on the Cab Control Handle. See Page 2-02.
Further adjustment can be made manually.
The machine is set-up at the factory with a Depth of Cut setting for 'average' conditions.



If manual adjustment is required to the depth of cut :

- Loosen the Rear Adjustment Bolts '**E**'.
- Remove the Front Locator-bolts '**F**'.
- To '**decrease**' the Depth of Cut, lift the Adjustment Frame '**G**', '**UP**', and fit the Front Locator-bolts into the '**lower**' hole in the Adjustment Frame '**G**'.
- To '**increase**' the Depth of Cut, lower the Adjustment Frame, and fit the Front Locator-bolts into the '**upper**' hole in the Adjustment Frame.
- Remove the Rear Adjustment Bolts '**E**', and fit them into the same, 'upper' or 'lower', hole in the Adjustment Frame '**G**', as the front Locator Bolts.



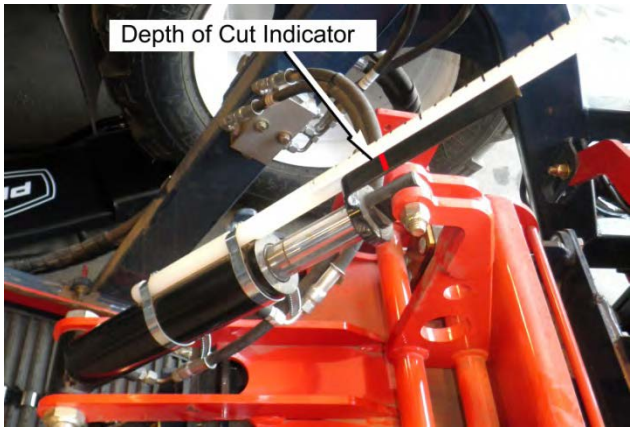
IMPORTANT

Do not attempt to install the front Locator-bolts in the **lower set of holes** in the Cutter Head Frame and the **top hole** in the Adjustment Frame, as the Adjustment Frame will foul against the Cutter Head Frame

Depth of Cut.

A Depth of Cut indicator is fitted on the depth cylinder.

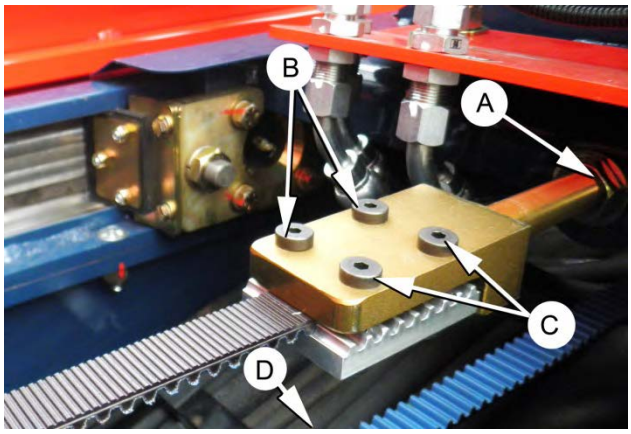
This gives the operator a quick visual indication of the depth of cut setting ,and if turf conditions change, to make the necessary adjustment.



Remove Arm Drive Belt.

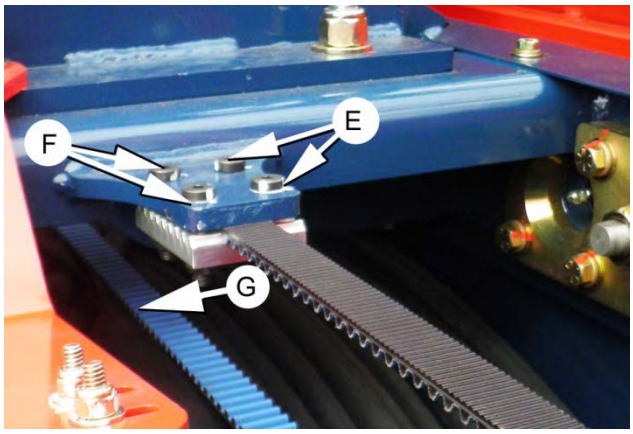
Front Clamp.

- To slacken the belt, back-off the Locknut '**A**' and also the adjuster nut inside the Arm Housing.
- Loosen the Socket Hd. Bolts '**B**'.
- Remove the Socket Hd. Bolts '**C**' and slide the belt
- sideways '**D**' out of the Clamp.
- Pull the loose end of the belt off the drive motor and through the Arm Mount.



Rear Clamp

- Loosen the Socket Hd. Bolts '**E**'.
- Remove the Socket Hd. Bolts '**F**' and slide the Belt sideways '**G** 'out of the Clamp.



Install a new belt in the reverse order.

IMPORTANT

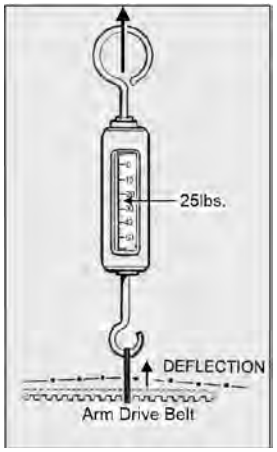
To ensure that the drive belt is tensioned correctly the following procedure must be carried out.
It is important that the belt is not set too tight as this will result in premature belt failure.

Checking Arm Drive Belt Tension.

Using a suitable tension gauge :

- Attach a strap around the Drive Belt.
- Hook the gauge in the strap and pull upwards.
- The gauge reading should reach 25lbs. before the belt shows ***any deflection.***

If available a compression gauge can also be used.



LUBRICATION

Recommended Lubrication Schedule.

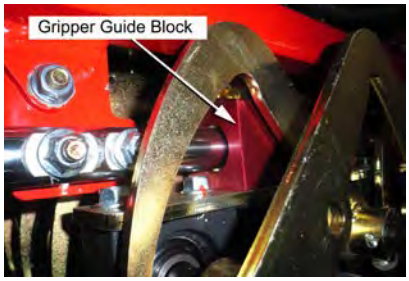
It is important that the Recommended Service Schedule is followed. Regular service and cleaning will maintain the machine in good working condition, prolong its working life and reduce repair costs.
Refer to the illustrations on following pages.

Every12 hours of operation.

Apply light oil to the chains that drive **:**

- Main Conveyor.
- Index Conveyor.
- Roll-Up Mat.
- Roll Eject Mat.
- Pallet Lift.
- Four Inch Roller.
- Pallet Push Bar Chains.
- Mast Forks Lift Chains.

IMPORTANT
Do not apply penetrating 0il,e.g WD 40, to any plastic bushings, such as IGUS. Particularly in: Gripper Guide Blocks and the Index Conveyor Slide Blocks



Do not use grease to lubricate chains. It accumulates dirt and results in premature chain wear.

Weekly.

Apply oil to the Pallet Injector Shafts, Linkages and Pivots.

Every 80 hours of operation :

Apply grease gun to all bearings:

- Cut-Off Cam.
- Connecting Rods.
- Cut-Off Blade Shaft.
- Ground Roller and Front Roller.
- Crown Roller.
- Main Conveyor Drive Shaft and Conveyor Sprocket Support Shaft.
- Four Inch Roller Shaft, Sprocket Drive Shaft, and Pivot Arm.
- Mat Idler Roller Shaft and Idler Arm Pivot.
- Roll-Up Mat Drive and Idler Shafts.
- Eject Mat Drive and Idler Shafts
- Pallet Lift Rollers.
- Gripper Pivots.
- Arm Carriage Slide Bearings
- Index Conveyor – Front Idler Shaft and Rear Drive Shaft.
- Index Conveyor Mat Tension Idler Shaft.
- Pallet Injector Pivot Bearings.

IMPORTANT

Steering Pivot Slewing Ring.
Refer to the following pages for details on lubricating procedure for the Slewing Ring. To ensure a long operating life on the Slewing Ring it is important to adhere to the lubricating instructions. Also note the **caution** concerning pressure washing in the vicinity of the upper grease seal.

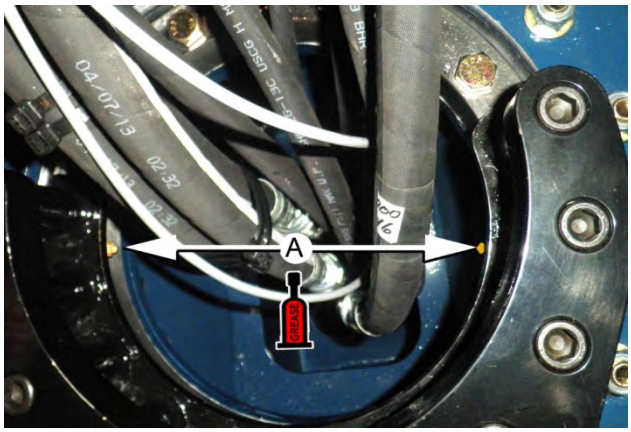
MAINTENANCE.

Maintenance Procedures.	DAILY	After first 25 hours	Every 50 hours	Every 100 hours
ENGINE. Important: Refer to the engine manufacturers manual for full maintenance/service instructions.				
Check/Top-off Engine Oil Level.	X	**Refer to the Engine Manufacturers Manual for:** Air Cleaner Pre-cleaner; Air Cleaner Element, Engine Oil and Oil Filter change. Battery maintenance.		
Check/Top-off Engine Coolant Level.	X			
Check for Water/Oil Leaks.	X			
Clean Air Intake Screen.	X			
Clean Radiator Cooling Fins.	X			
Check and top-off Battery.			X	
HYDRAULIC SYSTEM.				
Check for Oil Leaks.	X			
Check Oil Level and top off as required.				X
Change Hydraulic Oil.	After the first 1000 hours of operation. Then every 2000 hours.			
In-Line Filters & Arm Spin-off Filter.	See page 4-02 for service information.			
Charge Pressure Filter. (On Drive Pump - P1) .	See page 4-02 for service information			
DRIVE SYSTEM. **IMPORTANT** Change the Oil in the Torque Hubs ***after the first 50 hours of operation.*** Then every 1000 hours or annually, whichever occurs first. **EP 150 OIL MUST BE USED.** See page 4-03 for procedure				
HARVESTER				
Check all Fasteners and Fittings.		X		X
Check and oil, Chains and Sprockets.	X			
Check Tire Pressures : Front -35 psi. Rear - 48 psi.	X			
Check/Sharpen/Replace-Cutter Blades.	X			
Check/Adjust /Replace-Cutter Drive Belt.	X			
Check Main and Index Conveyor Belts.	X			
Check Conveyor Slides.	X			
Check Lug Nut Torque: Rear – 240 lbs/ft. Front – 240 lbs/ft.	X	X		
STORAGE: Clean the machine. Maintain Tire Pressures. Turn Battery Isolator Switch '**OFF**'. Maintain Battery Charge. Grease Hydraulic Cylinder Rods.				

Steer Slewing Ring.

IMPORTANT

It is important that the Slewing Ring is lubricated following the recommended instructions.
Failure to follow these instruction may cause the break-down of the bearing raceway, resulting in expensive repair costs.



Apply the pressure gun to both grease fittings '**A**' located on the inside face of the Slewing Ring.

LUBRICANTS.

Suitable lubricants for the raceway system are shown below.
Depending on operating temperatures, grease with base oils up to ISO VG1500 can be used to improve the lubricating film in slewing rings which are driven with very high loads and at very low speeds – (swiveling operation).
If these conditions occur, contact **INA** Engineering Service.

Raceway Lubricant.	**Manufacturer.**
Aralub HLP2.	Aral.
Energrease LS-EP2.	BP.
Gilssando EP2.	DEA.
EPEX EP2.	ELF.
BEACON EP2.	ESSO.
Centoplex GLP 402.	Kluber.
Mobilux EP2.	Mobil.
Alvania EP2.	Shell.
Retinax LX2. (INA Designation ;SM03).	Shell

See following page for more important information on Slewing Ring lubrication.

Slewing Ring.

Initial Grease Lubrication.
INA Slewing Rings are supplied with an initial grease lubrication of a high quality lithium complex soap base grease KPN2N-25 (DIN 51825).
The free space in the raceway system in the bearing is filled with grease. A grease with an operating temperature range of **-**13deg.F to **+**302deg.F(**-** 25deg.C to **+**150 deg. C), is suitable.

Re-lubrication Interval.
Re-lubrication intervals are dependant on :

- Operating conditions.
- Environmental issues such as contamination, water etc.
- The design of the Slewing Ring.

The re-lubrication interval can only be precisely determined by carrying out tests under operating conditions.
If comparable results are not available, the guide values shown below can be used.
Values shown are based on the following conditions:

- Operating temperature 158deg.F (70deg.C).
- Circumferential speed 0,5m/s.
- Low to medium loading.

Recommended re-lubrication period.

Heavy contamination, operating in field conditions. Harvesters, Cranes, Diggers. Excavators.	**100** to **200** hours.

The raceway system of a slewing ring should always be re-lubricated in the following instances :

- After each cleaning eg. spraying with water, steam etc.
- Before and after long stationary periods, such as inactive winter months, if high levels of moisture occur.

Grease 'operating life' for the raceway system.
If re-lubrication is not possible, the operating life is a decisive factor.
Experience of a large number of applications shows that guide values for the grease operating life can be taken as twice that of the guide value for the re-lubrication interval.

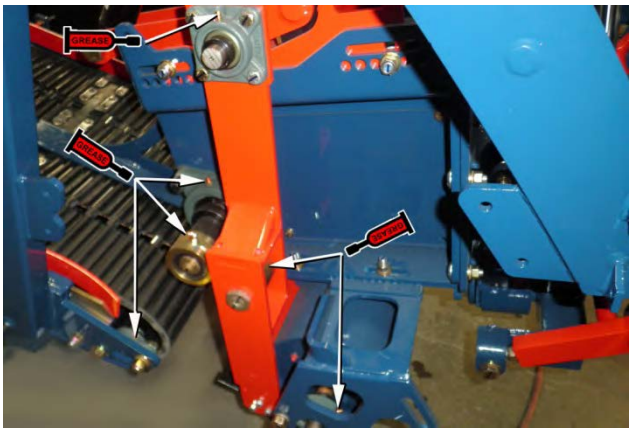
At operating temperatures over 158deg. F (70deg.C), both the re-lubrication interval and the grease operating life are reduced.
In order to ensure operational safety, the grease operating life should not exceed 3 years.

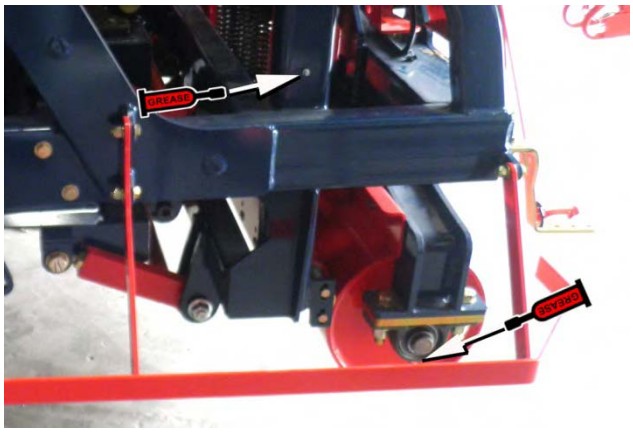
IMPORTANT

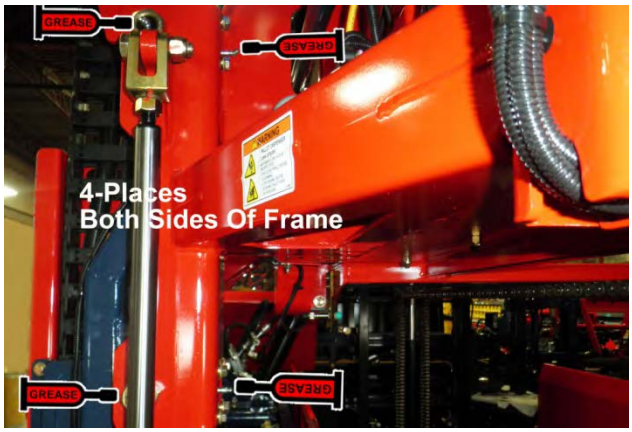
When using a pressure washer do not allow the water jet to be pointed at the Slewing Ring Seals. The high pressure water will force dust, dirt and contaminants past the seals and into the raceway. This will result in premature failure of the bearings in the raceway system.

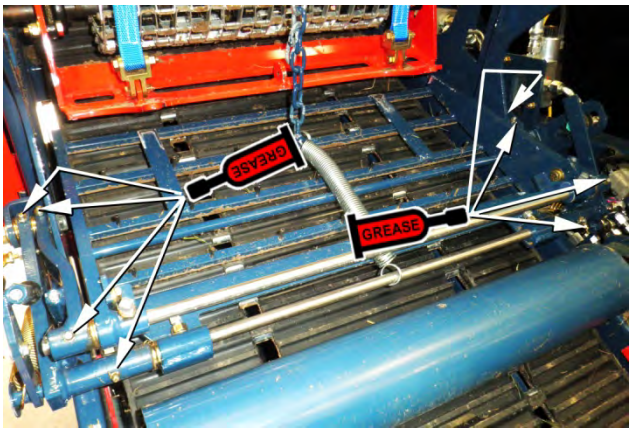
Raceway System.
Re-lubrication procedure.
Contaminants such as dirt, dust, spray water and cont aminants are forced out by the re-lubrication procedure.

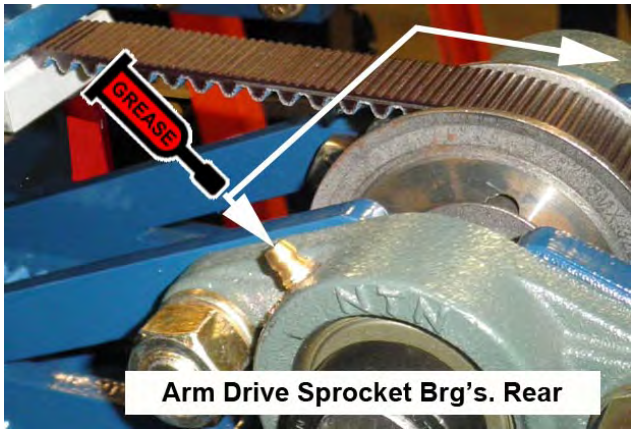
- It is preferred that the same lubrication as used for the initial operation should be used for re-lubrication.
- Re-lubrication should always be carried out while the slewing ring is warm from operation.
- Clean the lubricating grease fittings.
- Press grease into the lubricating grease fittings in turn, until a collar of fresh grease forms all the way around both of the seals (turn one bearing ring slowly during this process).
- The used grease must be able to flow out unhindered.
- Ensure that all feed ducts are full of lubricant before returning the slewing ring to operation.

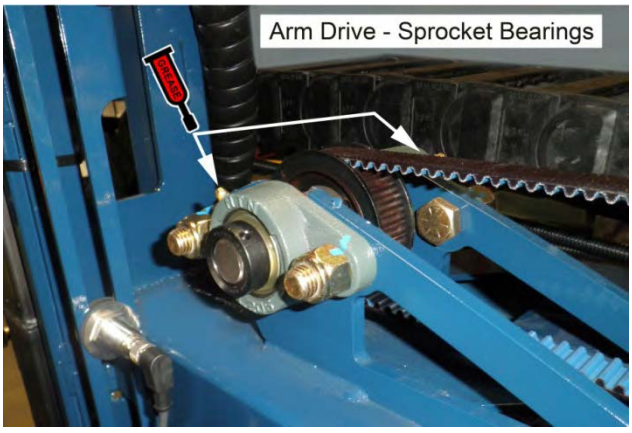

GREASE
GREASE
GREASE

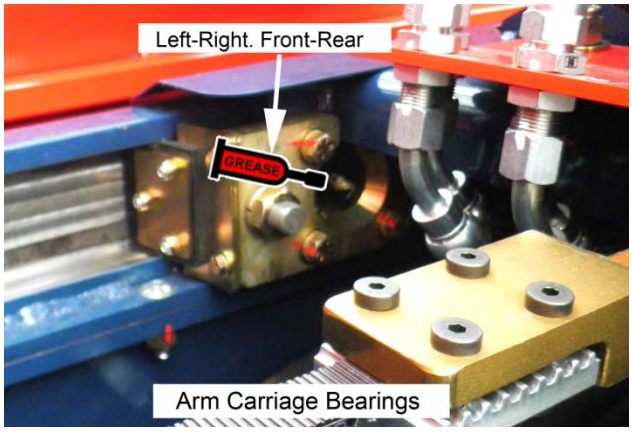

GREASE
GREASE

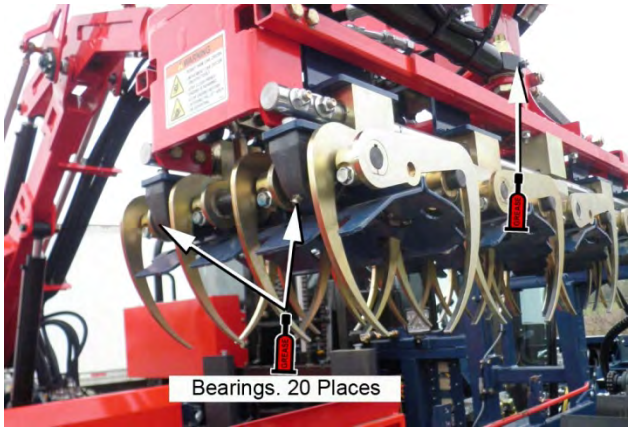

GREASE
GREASE
4-Places
Both Sides Of Frame
GREASE
GREASE

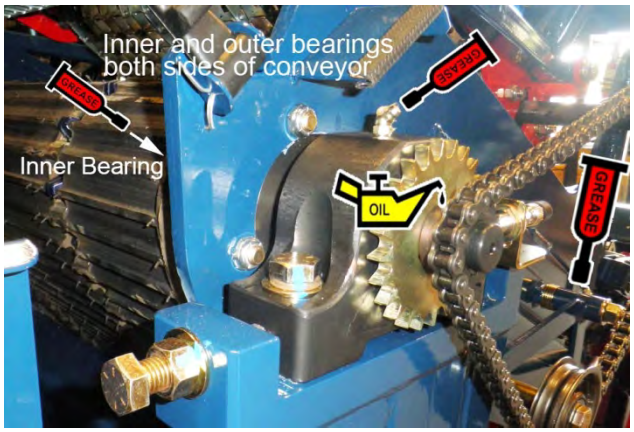

GREASE
GREASE

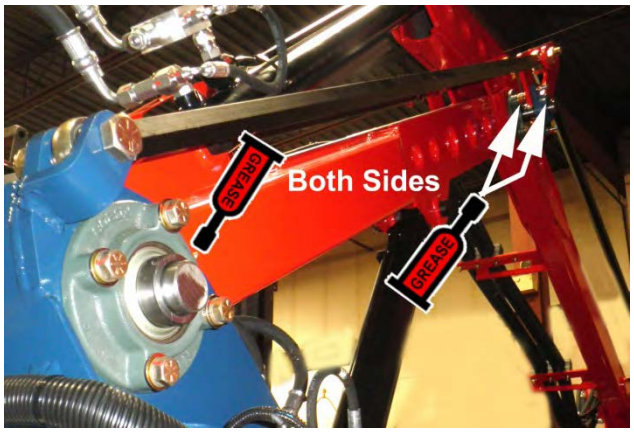

GREASE
Arm Drive Sprocket Brg's. Rear

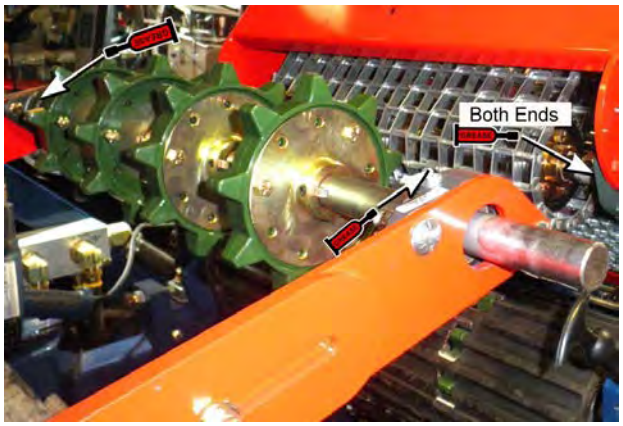

Arm Drive - Sprocket Bearings
GREASE

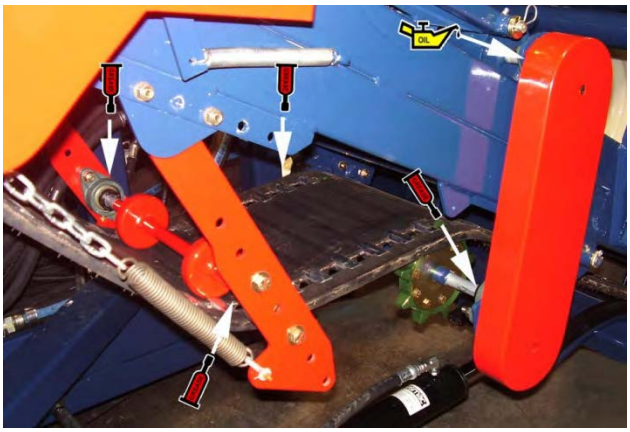

Left-Right. Front-Rear
GREASE
Arm Carriage Bearings

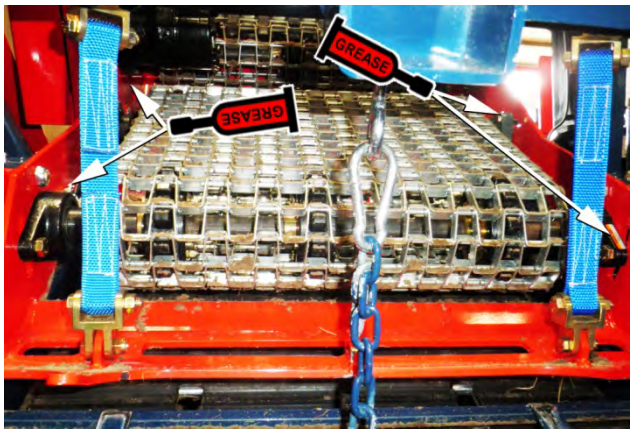

Bearings. 20 Places

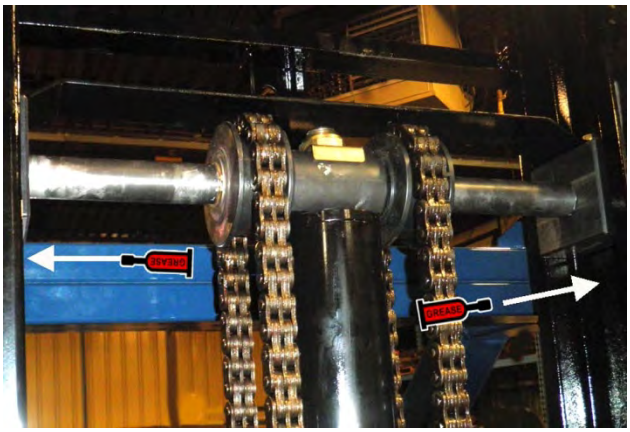

Inner and outer bearings
both sides of conveyor
GREASE
GREASE
Inner Bearing
OIL
GREASE

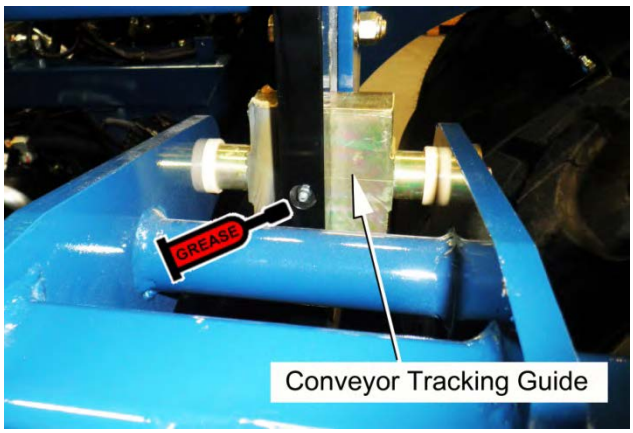

GREASE
Both Sides
GREASE

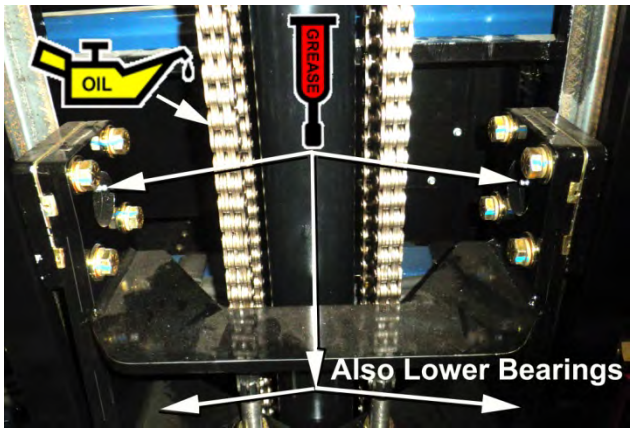

Both Ends


OIL


GREASE
GREASE

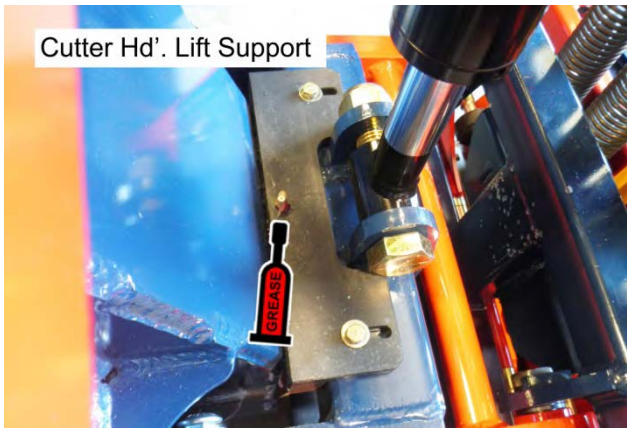

GREASE
GREASE

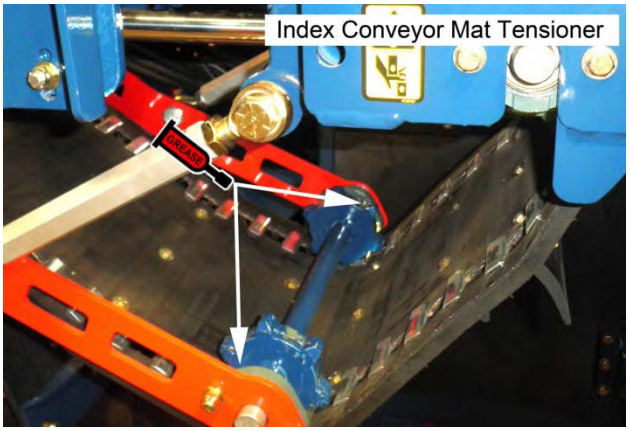

GREASE
Conveyor Tracking Guide

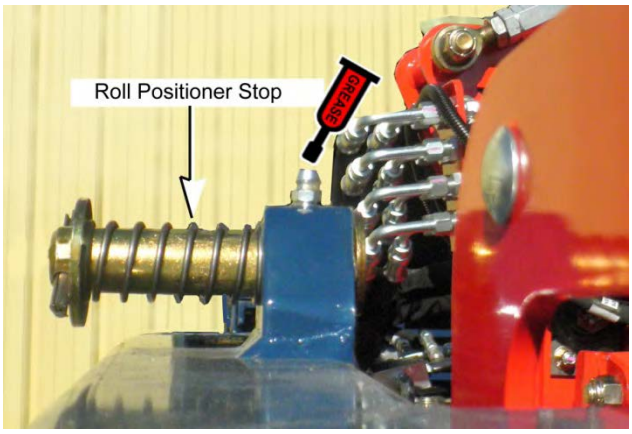

OIL
GREASE
Also Lower Bearings

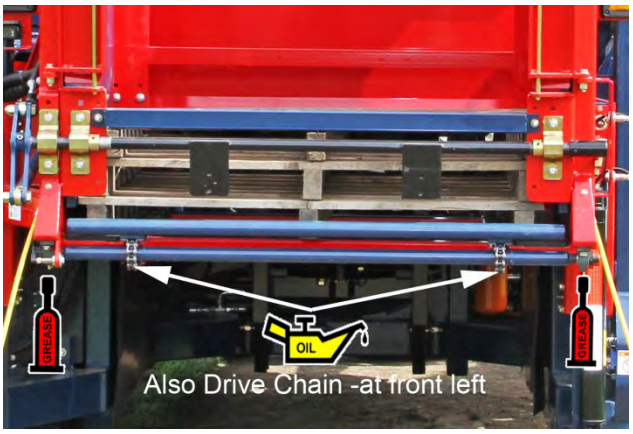

OIL
Index Conveyor Drive Chain


Ski Guide Shoe
GREASE


Cutter Hd'. Lift Support
GREASE


Index Conveyor Mat Tensioner
GREASE

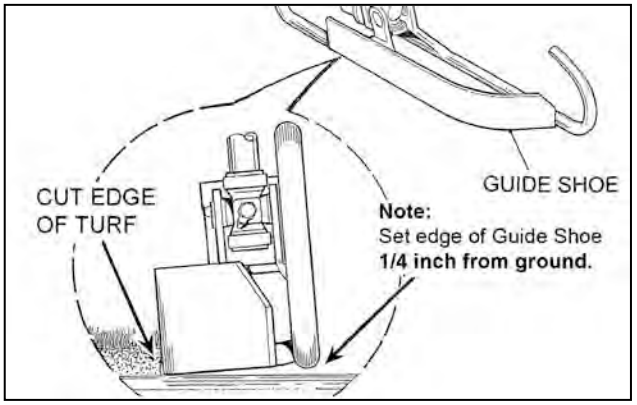

Roll Positioner Stop
GREASE


GREASE
OIL
GREASE
Also Drive Chain -at front left

SECTION 7

Auto-Steer Set-Up.

Auto-Steer Operation.



When the machine is ready to commence harvesting, it is important that the Auto-Steer set-up is carried out as shown in the following instructions.
The operator must read the operating instructions in Sections 2 and 3, before using the Auto-Steer.

Cutting the Starting Strip.

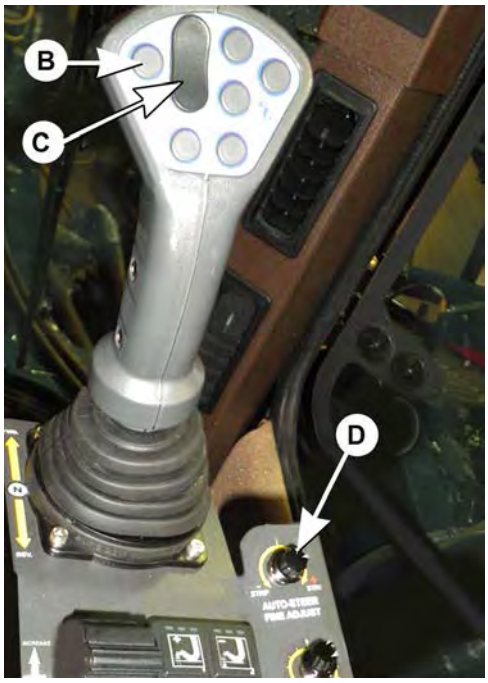
The starting strip of turf must be cut '**manually steering**', this creates the turf 'edge' for the Guide Shoe to follow.

- Start the engine and Switch System Power '**ON**' with Switch '**A**'. Prepare to start the harvesting procedure as shown on page 3-07.

Using ***manual steering*** proceed to cut the starting strip.
The starting strip ***must be cut straight*****,** to ensure satisfactory operation of the Auto-Steer.

When the starting strip has been cut :

- Position the harvester parallel to the start strip, with the Cutter Side Blade aligned with the '**cut edge**' of the turf.
- Activate the Auto-Steer to '**ON**' with Pad '**B**', on the Control Handle.

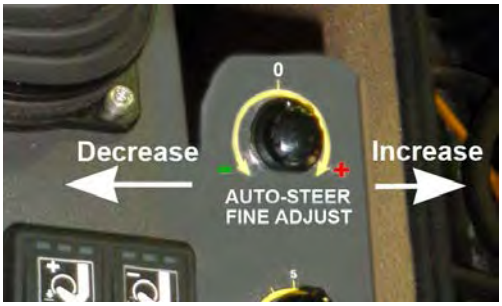


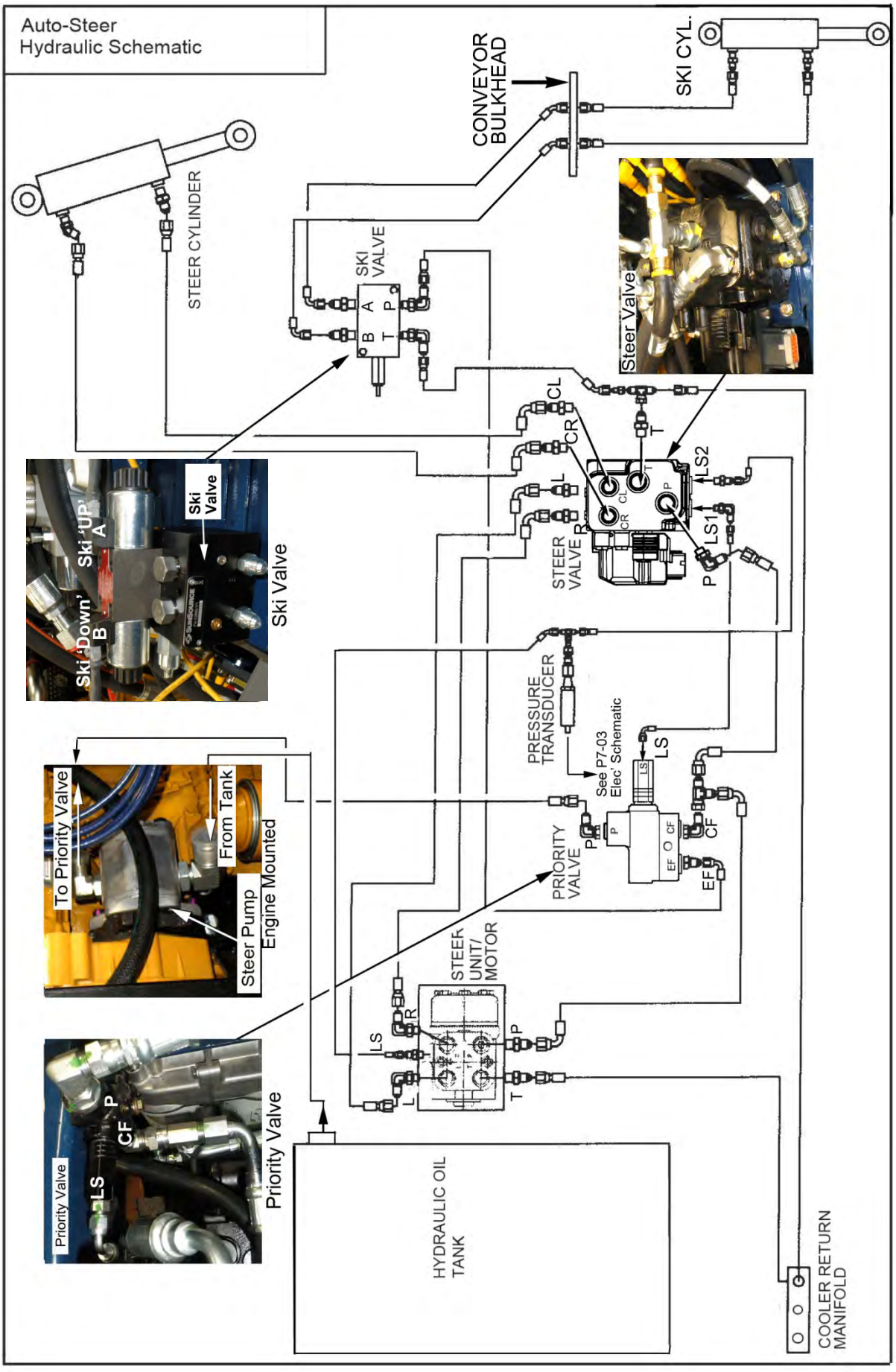
NOTE

If the Guide Shoe lowers on the 'un-cut' turf, when the Auto-Steer is activated, turn the Auto-Steer '**OFF**'. The re-set cylinder will move the Guide Shoe 'off ' the un-cut turf, then turn the Auto-Steer back '**ON**'.

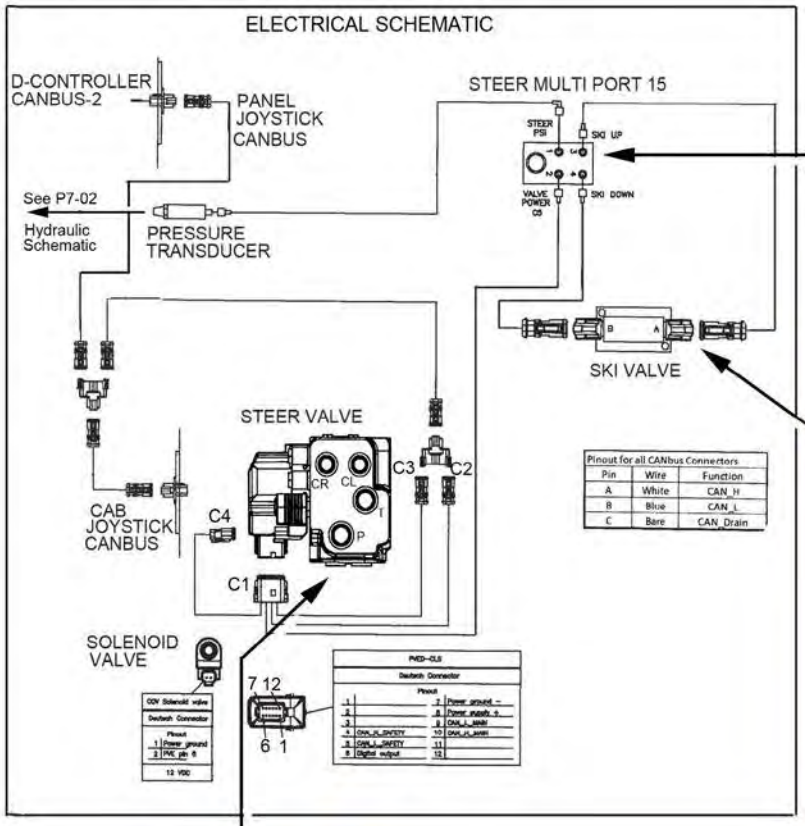
Proceed to cut the second strip:

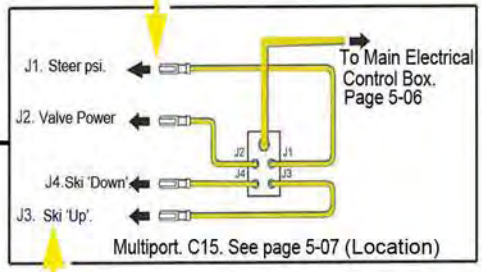
- Lower the Cutter Head with Pad '**C**'.
- Continue cutting the second strip, using the 'Fine Adjust' Control '**D** to trim any waste, or leave a strip of turf if required.



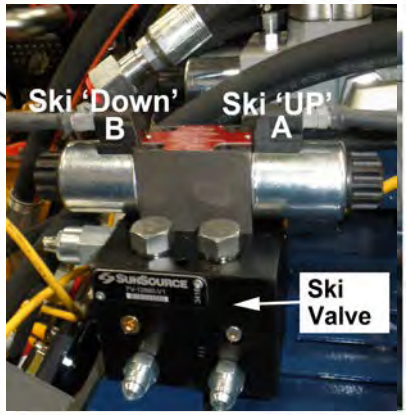

Auto-Steer
Hydraulic Schematic
CONVEYOR BULKHEAD
SKI CYL.
STEER CYLINDER
SKI VALVE
A
P
B
T
Steer Valve
CL
CR
T
LS2
LS1
P
STEER VALVE
PRESSURE TRANSDUCER
See P7-03 Elec' Schematic
LS
PRIORITY VALVE
CF
EF
STEER UNIT/ MOTOR
R
L
HYDRAULIC OIL TANK
COOLER RETURN MANIFOLD
Ski Valve
Ski 'UP' A
Ski 'Down' B
To Priority Valve
From Tank
Steer Pump
Engine Mounted
Priority Valve
LS
CF
P

Auto-Steer. - Electrical Schematic

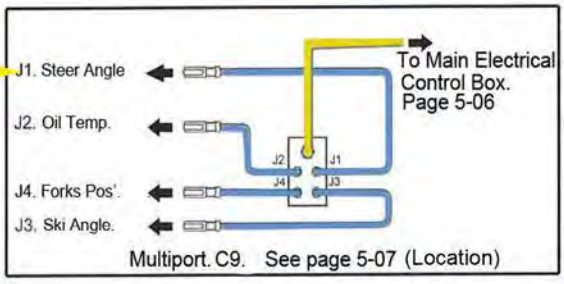


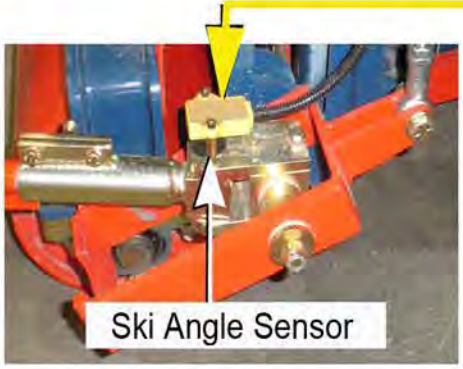


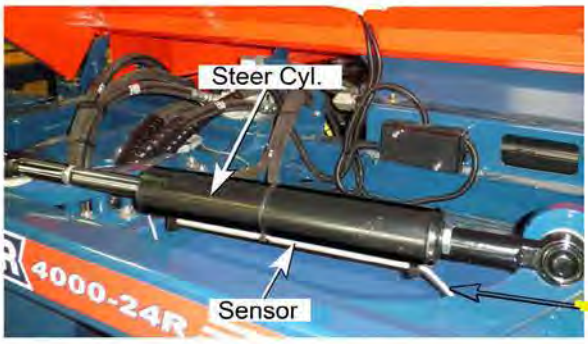
Pressure Transducer



SeeP7-02 Hyd' Sch'.







Steer Cylinder.

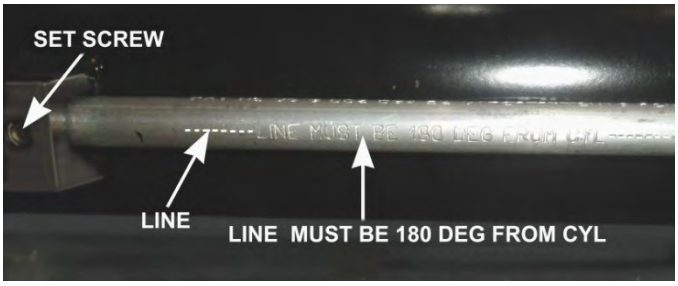
If the Steer Cylinder is replaced it is important that the following procedure is followed.

- Prior to installation: With the Cylinder fully retracted the Rod and Head Ends should be adjusted to 29 in.(737mm) center to center.
- At this Point tighten only the Head End Lock-nut.

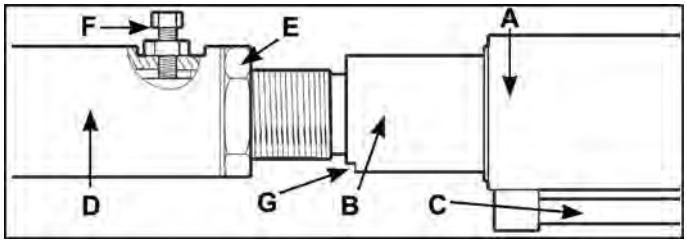
The Rod End lock-nut 'E' is tightened after the sensor alignment procedure as shown below.

IMPORTANT

If the Sensor is replaced or moved from cylinder to cylinder it is imperative that the indicator line on the Sensor is positioned 180 deg. from the cylinder, as shown. The Set Screw allows the removal of or adjustment of the Sensor.



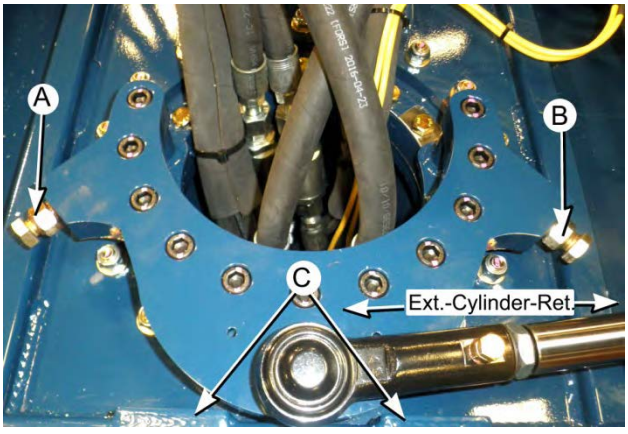
- Ensure that the 'notch' '**G**' in the cylinder rod is aligned with the Cylinder Sensor '**C**'.
- Turn the Rod End '**D**' to position the Lock-bolt '**F**' 180 degrees opposite to the Cylinder Sensor '**C**'. Tighten lock-bolt 'F' until it is hard against the flat portion of the Cylinder Rod '**B**'. Tighten the Lock-nut 'E'..
- Tighten the Locknut '**E**'.



This prevents the possible rotation of the cylinder rod if the lock-nut '**E**' loosens, causing misalignment of the sensors and loss of auto-steer calibration.

Steering angle - Stop Bolts adjustment.

- Turn the Stop Bolts '**A**'&'**B**' fully '**IN**'.
- Retract the Steer Cylinder, (left lock) , until it 'bottoms out'.
- Turn the Stop Bolt '**A**' **out** until it is against the Frame, at '**C**'
  Extend the cylinder '*slightly*' so that the bolt is 1/8in. away from the frame, and tighten it hard against the frame. Tighten the lock-nut.
- Repeat the procedure with Stop Bolt '**B**' and with the cylinder fully extended. (Right lock).



SECTION 8

Radio Owners Manual.

Cab Controls.

1. Hazard Lights. **2.** Road Lights.

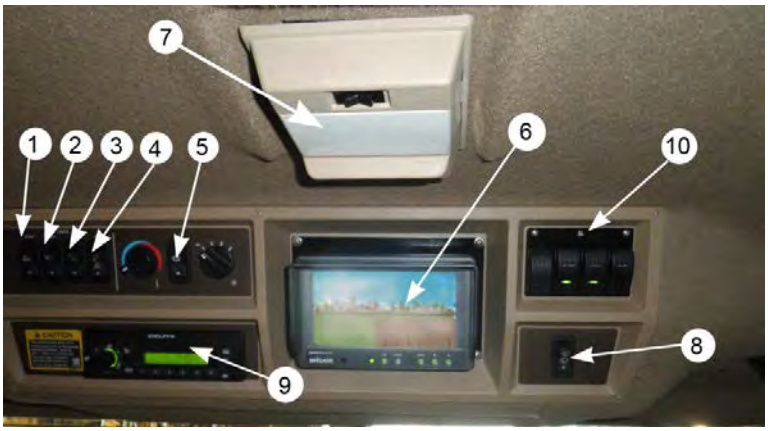
3. Field Lights. **4.** Work Lights.

5. A/C Controls. **6.** Rear View Screen

7. Cab O/Head Light. **8.** W/Shield Washer/Wiper.

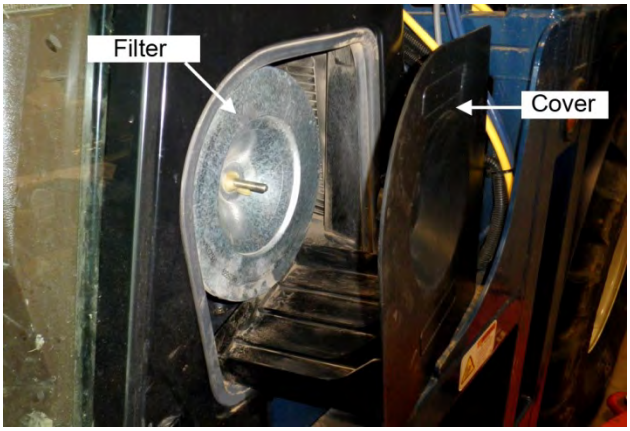
9. Radio.(See following Insert for Owner's Manual).

10. Switch Panel. (See page 2-01).



Cab Air Conditioner Filter.

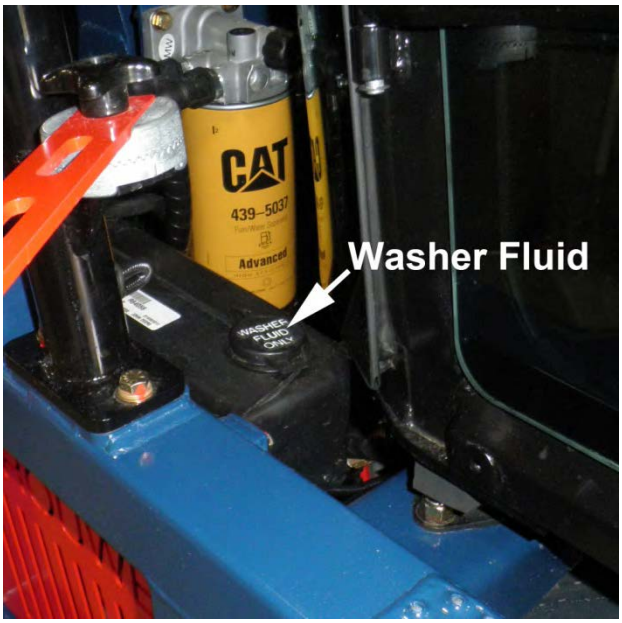
Remove the Air Cleaner Cover to access the Filter. Unscrew the retainer nut and remove the filter. Thoroughly clean the filter, or fit a new one if needed When fitting the cover ensure that the rubber seal is intact and correctly seated.



Windshield Washer.

The Washer Fluid Container is located as shown.

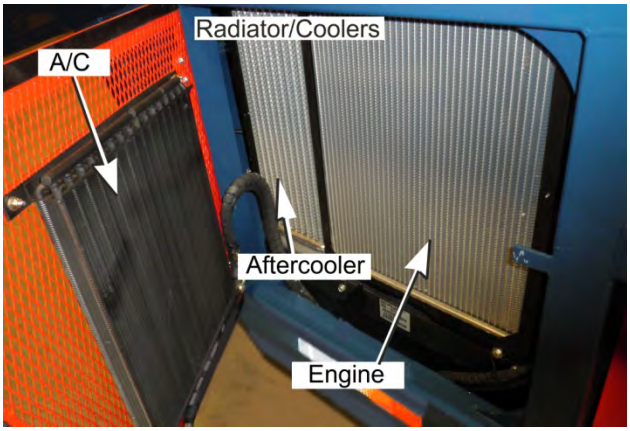
Always use a quality washer fluid that is suitable for the temperature zone in which the machine will be operating.



Engine, Aftercooler and Air Conditioner Coolers.

Check regularly and remove any dust or debris from the coolers that will affect their efficiency.

See section 9 – Engine Operation and Service Manual for Radiator/Cooler maintenance procedure.



JHD1635BT

AM/FM/RBDS/WB/USB/AUX-IN/BT/Sirius XM Ready Heavy Duty Radio

Installation and Operation Manual

CONTENTS

INTRODUCTION

System Features

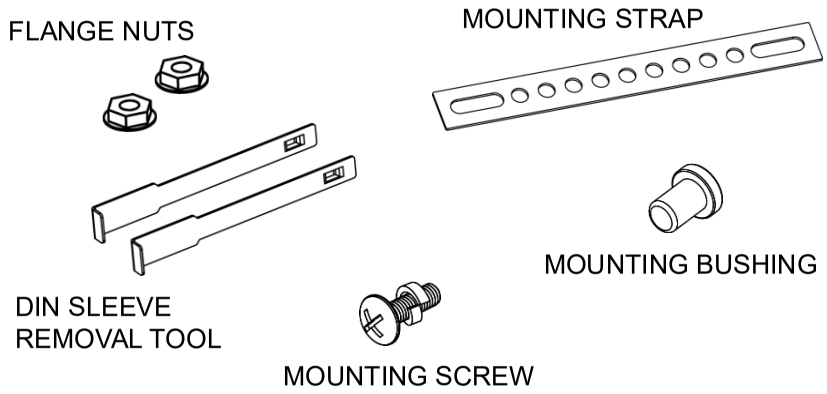
Features of Jensen JHD1635BTmobile audio system include:

- Full Dot Matrix LCD
- AM/FM US/EURO Tuner with 30 Presets (12AM, 18FM)
- RBDS (Radio Broadcast Data Service) with PTY Search
- Sirius XM Radio Ready
- USB Playback of MP3 and WMA files (Front USB or Rear USB)
- Weatherband Tuner with SAME Technology
- Mute
- Bluetooth (Supports A2DP, AVRCP and HFP)
- Pre-set Equalizer – 5 settings (User, Flat, Pop, Classical, Rock)
- Electronic Bass, Treble, Balance and Fader Controls
- Output Power 45W x 4
- Clock 12/24 Hour Selectable
- Public Announcement (PA) Feature with Optional Microphone
- IR Wireless Remote Control Ready (sold separately)
- 2-Channel Pre-amp Line Level Outputs
- 2- Wire Power with Non-Volatile Memory and Clock/Time support
- Auxiliary Audio Input (Front 3.5mm Stereo Jack, Rear RCA)
- Wired Remote Control Ready(JHDHBC Sold Separately)

Content List

- Jensen Heavy Duty Radio
- Hardware Kit
- Installation Manual
- Quick Reference Guide

HARDWARE KIT CONTENTS



SAFETY INFORMATION

When Driving

Keep the volume level low enough to be aware of the road and traffic conditions.

When Washing Your Vehicle

Do not expose the product to water of excessive moisture. Moisture can cause electrical shorts, fire or other damage.

When Parked

Parking in direct sunlight can produce very high temperatures inside your vehicle. Give the interior a chance to cool down before starting playback.

Use the Proper Power Supply

This product is designed to operate with a 12 volt DC negative ground battery system.

WARNING:

- TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.
- TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK AND ANNOYING INTERFERENCE, USE ONLY THE RECOMMENDED ACCESSORIES.

INSTALLATION

This unit is designed for installation in vehicle cabs with an existing 1-DIN radio opening. In many cases, a special installation kit will be required to mount the radio to the dashboard. See the dealer where the radio was purchased for kit availability. Always check the kit application before purchasing to make sure the kit works with your vehicle.

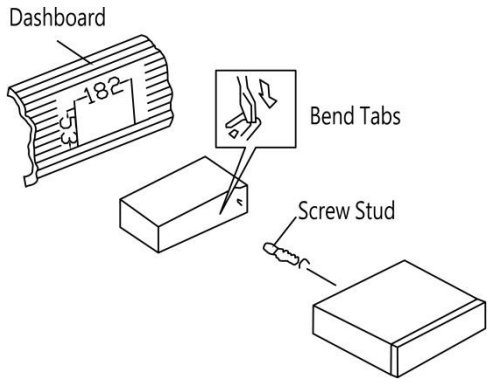
Before you Begin

1. Disconnect Battery
   Before you begin, always disconnect the battery negative terminal.
2. Remove Transport Screws

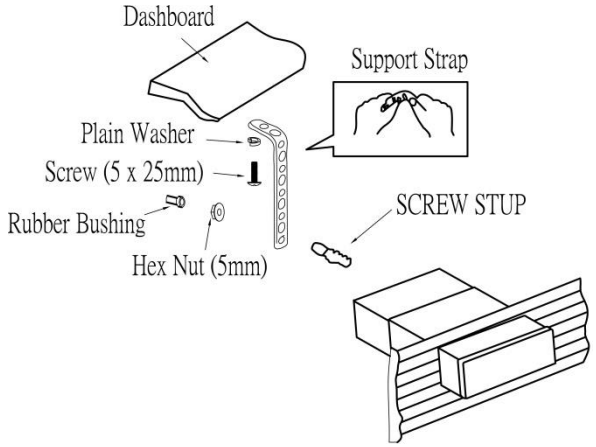
Important Notes

- Before final installation, test the wiring connections to make sure the unit is connected properly and the system works.
- Use only the parts included with the unit to ensure proper installation. The use of unauthorized parts can cause malfunctions.
- Consult with your nearest dealer if installation requires the drilling of holes or other modifications to your vehicle.
- Install the unit where it does not interfere with driving and cannot injure passengers during a sudden or emergency stop.
- If the installation angle exceeds 30° from horizontal, the unit might not give optimum performance.
- Avoid installing the unit where it will be subjected to high temperatures from direct sunlight, hot air, or from a heater, or subject to excessive dust, dirt or vibration.

DIN Front Mount



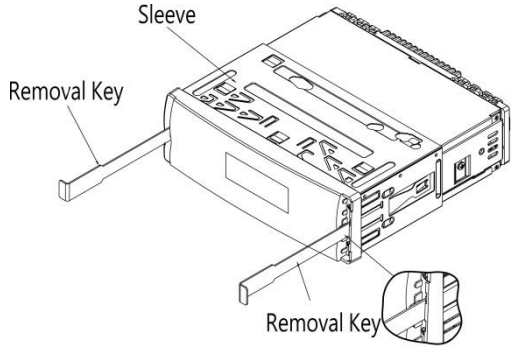
1. Slide the mounting sleeve off of the chassis if it has not already been removed. If it is locked into position, use the removal keys (supplied) to disengage it. The removal keys are depicted in “Removing the Unit” on page 3.
2. Check the dashboard opening size by sliding the mounting sleeve into it. If the opening is not large enough, carefully cut or files as necessary until the sleeve easily slides into the opening. Do not force the sleeve into the opening or cause it to bend or bow. Check that there will be sufficient space behind the dashboard for the radio chassis.
3. Locate the series of bend tabs along the top, bottom and sides of the mounting sleeve. With the sleeve fully inserted into the dashboard opening, bend as many of the tabs outward as necessary to firmly secure the sleeve to the dashboard.
4. Place the radio in front of the dashboard opening so the wiring can be brought through the mounting sleeve.
5. Follow the wiring diagram carefully and make certain all connections are secure and insulated with crimp connectors or electrical tape to ensure proper operation.
6. After completing the wiring connections, turn the unit on to confirm operation (vehicle accessory switch must be on). If the unit does not operate, recheck all wiring until the problem is corrected. Once proper operation is achieved, turn the accessory switch off and proceed with final mounting of the chassis.



7. Carefully slide the radio into the mounting sleeve making sure it is right-side-up until it is fully seated and the spring clips lock it into place.
8. Attach one end of the perforated support strap (supplied) to the screw stud on the rear of the chassis using the hex nut provided. Fasten the other end of the dashboard either above or below the radio using the screw and plain washer provided. Bend the strap, as necessary, to position it. Some vehicle installations provide cavity for rear support. In these applications, place the rubber bushing over the screw stud and insert.
   CAUTION: The perforated rear support strap or rear rubber mounting bushing must be used in the installation of the radio. Installation without either may result in damage to the radio or the mounting surface and void the manufacturer’s warranty.
9. Test radio operation by referring to the operating instructions for the unit.

Removing the Unit

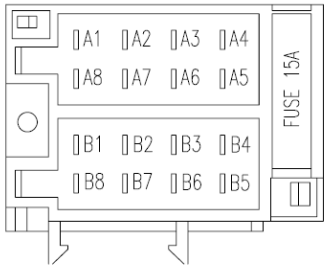
To remove the radio after installation, remove the plastic end caps, insert the removal keys straight back until they click, and then pull the radio out. If removal keys are inserted at an angle, they will not lock properly to release the unit.



Reconnect Battery

When wiring is complete, reconnect the battery negative terminal.

WIRING

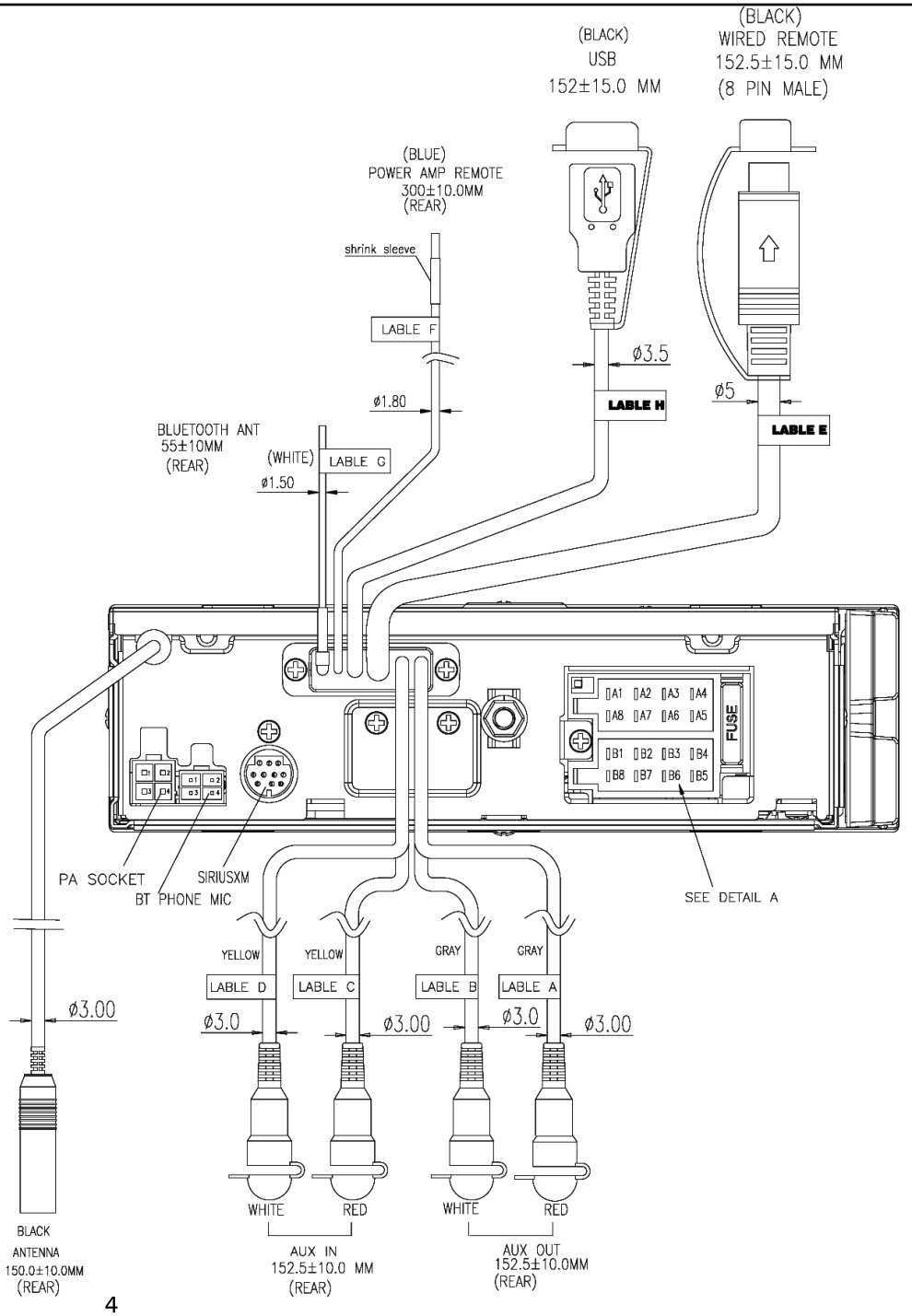


DETAIL A

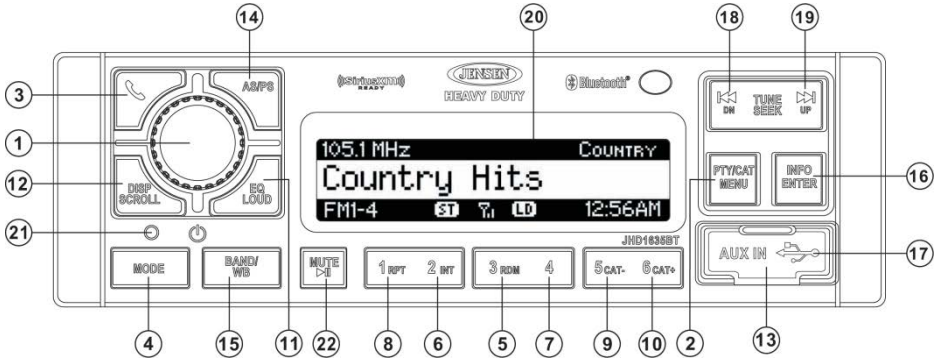
SHOWN FROM PIN VIEW

PIN NO.	DESCRIPTION
A1	RIGHT REAR SPEAKER (+)
A2	RIGHT FRONT SPEAKER (+)
A3	LEFT FRONT SPEAKER (+)
A4	LEFT REAR SPEAKER (+)
A5	LEFT REAR SPEAKER (–)
A6	LEFT FRONT SPEAKER (–)
A7	RIGHT FRONT SPEAKER (–)
A8	RIGHT REAR SPEAKER (–)
B1	NO CONNECTION
B2	NO CONNECTION
B3	NO CONNECTION
B4	NO CONNECTION
B5	GROUND
B6	NO CONNECTION
B7	+12V ACC SWITCHED
B8	NO CONNECTION

WARNING!
Do not connect the +12VDC ACC switched wire to the battery. This wire MUST be connected to the Accessory/Ignition wire or a +12 volts switched power source.

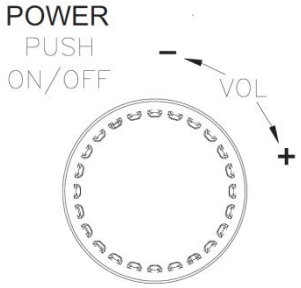


BASIC OPERATION



Power On/Off/Radio

Press the rotary encoder **POWER** button (1) to turn the unit on or *press and hold* to turn off. The unit will resume at the last mode selected (Tuner, Auxiliary, etc.).



Volume Control

To increase the volume, turn the rotary encoder (1) to the right. To decrease the volume, turn the rotary encoder to the left. While adjusting the volume, the LCD displays a bar graph and numerical representation of the level.

The maximum volume setting is 40.

Mute

Press the **MUTE** button (22) to mute the audio output. Press **MUTE** again to restore the audio output to the previous level.

Mode

Press the **MODE** button (4) to select a different mode of operation, as indicated on the display panel. Available modes include the following: Tuner (AM/FM) > SXM (SiriusXM) > iPod/USB > Auxiliary > BT Audio. Tuner is the default source when a prior source is no longer available.

NOTE: iPod, USB or SiriusXM (SXM) mode will be skipped if the device is not installed.

NOTE: SiriusXM (SXM) mode will be skipped when the Region menu option is set to "EURO".

Reset

The reset button should be activated for the following reasons:

- Initial installation of the unit when all wiring is completed
- Function buttons do not operate
- Error symbol on the display

Use a ball point pen or thin metal object to press the RESET button (21). This may be necessary should the unit display an error code.

Audio Menu

Press the **POWER/AUDIO** button (1) to access the audio menu. You can navigate through the audio menu items by pressing the **POWER/AUDIO** button repeatedly. Once the desired menu item appears on the display, adjust that option by turning the rotary encoder (1) within 5 seconds. The unit will automatically exit the audio menu after five seconds of inactivity. The following menu items can be adjusted.

Bass Level

Use the rotary encoder (1) to adjust the Bass level range from "-6" to "+6".

Treble Level

Use the rotary encoder (1) to adjust the Treble level range from "-6" to "+6".

Balance

Adjusting Balance controls the relative level between the left and right speakers in each pair. Use the rotary encoder (1) to adjust the Balance between the left and right speakers from "Left 12" to "Right 12".

Fader

Adjusting Fade controls the relative level between the front and rear speaker pairs. Use the rotary encoder (1) to adjust the Fader between the rear and front speakers from "Rear 12" to "Front 12".

System Menu

1. Press and hold the **PTY/CAT/MENU** button (2) for more than 2 seconds to enter the system menu. The first menu item, “Key Beep”, will appear on the display.
2. Press the **TUNE/SEEK |<< / >>|** (18, 19) button repeatedly to navigate the system menu.
3. Press the **INFO/ENTER** button (16) to select the desired item.
4. Press the **INFO/ENTER** button again to adjust the selected menu item.

The following items can be adjusted:

- Key Beep (On / Off): Turn the audible beep On/Off (heard when functions/buttons are selected).
- LCD Backlight (1-10): Adjust LCD brightness.
- LCD Contrast (1-10): Adjust LCD contrast.
- Button Backlight (1-10): Adjust Button brightness.
- Tuning Region (USA / EURO): Set frequency spacing for various regions.
- Power-Off Clock (Off, 1-10): Brightness setting of clock when powered off
- Clock Format (12Hour / 24Hour): Select 12 or 24 hour display mode.
- Set Clock (HH : MM):
  - Press the **INFO/ENTER** button (16) to view the clock set screen.
  - Press the **INFO/ENTER** button to move to the next digit.
  - Press the **TUNE/SEEK |<< / >>|** (18, 19) buttons to adjust the selected digit.
- Alarm Time
  - Alarm (On/Off)
  - Alarm Set Time (HH:MM)
- Preset-Only Tuning (On / Off)
- Sirius XM Settings Menu (only appears when Sirius XM tuner is connected and in Sirius XM mode)
  - Clock Autoset (On/Off): Sets clock based on SXM data
  - Time Zone1 (Atlantic / Eastern / Central / Mountain / Pacific / Alaska)
  - Daylight Saving Time (Yes/No)
  - Set Lock Code: _ _ _ _
  - Locked Channels: List of Channels (Locked / Unlocked)
  - SXi Firmware Version
- Weather Alert Configuration
  - Min Alert Level (All / None / Warnings / Watches)
  - Auto-On Enable (Yes/No): Select “Enabled” to turn on the radio when NOAA alerts are issued. This function only works when the +12V switched is on.
  - Alert Volume (Select Volume Level 0-40)
  - Clear SAME Codes <ENTER>
  - SAME Code 1: _ _ _ _ _ _
  - SAME Code 2: _ _ _ _ _ _
  - SAME Code 3: _ _ _ _ _ _
  - SAME Code 4: _ _ _ _ _ _
  - SAME Code 5: _ _ _ _ _ _
  - SAME Code 6: _ _ _ _ _ _
  - SAME Code 7: _ _ _ _ _ _
- Battery Alarm (On/Off)
- Battery Auto-Off (On/Off)
- Bluetooth Setup
  - BT: (On/Off)
  - BT HFP Volume: (Select Volume Level 0-40) Hands-free call volume
  - BT Device List <Enter>: View a list of devices paired with the unit
    - Lock
    - Connect / Disconnect
    - Delete
  - BT Pair <Enter to enable>
  - BT Auto Answer: (On/Off)
- Reset System Defaults <ENTER>: Press the **INFO/ENTER** button (16) to return the unit to factory default set up values.

Equalizer

Press the EQ/LOUD button (11) to choose one of the following pre-defined bass and treble curves: USER > FLAT > POP > CLASSICAL > ROCK .

Loudness

Press and hold the EQ/LOUD button (11) to toggle loudness on/off. When listening to music at low volumes, this feature will boost the bass and treble ranges to compensate for the characteristics of human hearing.

Auxiliary Input

To access an auxiliary device:

1. Connect the portable audio player to the 1/8” AUX IN on the front panel (13)
2. Press the **MODE** button (4) to select “Auxiliary” mode.
3. Press **MODE** again to cancel “Auxiliary” mode and go to the next mode.

PA Operation

- Connect PA Microphone (JMICHFP) with a 4-PIN connector to the 4-PIN socket on the rear of the unit.
- The unit will automatically switch to PA mode when the mic switch is pushed “ON”.
- The PA output level can be adjusted using the rotary volume encoder (1).
- With radio power off, the radio will wake up when PA mic button is pressed to make an announcement. Please note that it will take a few seconds before the radio “wakes up” and PA is active. Radio will return to the off state when the PA mic is released.

Liquid Crystal Display (LCD)

The current frequency and activated functions are shown on the LCD panel (20).

NOTE: LCD panels may take longer to respond when subjected to cold temperatures for an extended period of time. In addition, the visibility of the characters on the LCD may decrease slightly. The LCD display will return to normal when the temperature increases to a normal range.

Setting the Clock

To set the clock to display the current time, turn the vehicle ignition on and turn the radio on. Enter the system menu and adjust the clock by selecting the “Set Clock” menu item.

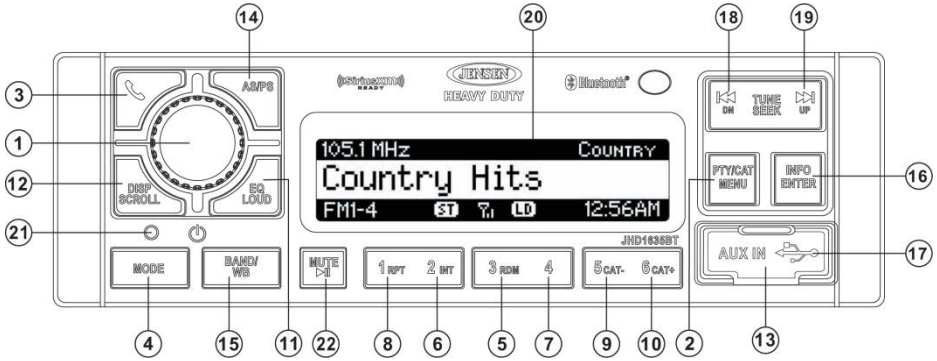
- Press the **INFO/ENTER** button (16) to view the clock set screen.
- Press **the TUNE/SEEK |<< / >>|** (18, 19) buttons to adjust the selected digit.

Press the **INFO/ENTER** button to move to the next digit.When no adjustment is made for five seconds, the time will become set and normal operation will resume.

Scroll

When the information is too long to be displayed on the LCD, press the **DISP/SCROLL** button (12) to view the entire title. The information will scroll twice and then return to abbreviated text.

TUNER OPERATION



Select a Band

Press the **BAND/WB** button (15) to change between three FM bands and two AM bands.
Press and hold the **BAND/WB** button to access the Weather band (WB).

Manual Tuning

Press the **TUNE/SEEK |<<** or **>>|** buttons (18, 19) to seek stations up/down step by step.

Auto Seek Tuning

Press and hold the **TUNE/SEEK |<<** or **>>|** buttons (18, 19) to automatically seek the next or previous strong station.

NOTE: Seek tuning is not available for weather band channels. Use the up or down tuning buttons to manually select any of the seven available weather band channels.

Preset Stations

Six numbered preset buttons store and recall stations for each band.

Store a Station

Select a band (if needed), then select a station. Press and hold a preset button (5-10) for two seconds. The preset number will appear on the LCD.

Recall a Station

Select a band (if needed). Press a preset button (5-10) to select the corresponding stored station.

NOTE: Preset buttons are pre-assigned frequencies in weather band mode.

Automatically Store / Preset Scan (AS/PS)

Automatically Store

Select an AM or FM band. Press and hold the **AS/PS** button (14) for more than 2 seconds to automatically select 18 strong stations (12 for AM). “Storing Presets” appears on the screen and the new stations replace any stations already stored.

Preset Scan

Select a band. Press **AS/PS** (14) to scan stations stored in the current band. The unit will pause for 5 seconds at each preset station. Press **AS/PS** again to stop scanning when the desired station is reached.

RBDS Operation

This unit is equipped to display RBDS (Radio Broadcast Data Service) information when broadcast by the radio station.

NOTE: Radio stations broadcasting RBDS may not be available in your listening area.

In FM radio mode, press the **PTY/CAT/MENU** button (2) to list the following Program Type (PTY) options: ANY / News / Information / Sports / Talk / Rock / Classic Rock / Adult Hits / Soft Rock / Top 40 / Country / Oldies / Soft / Nostalgia / Jazz / Classical / Rhythm and Blues / Soft Rhythm & Blues / Foreign Language / Religious Music / Religious Talk / Personality / Public / College / Weather / Emergency Test / EMERGENCY!

To search for stations in a PTY category:

1. Press the **PTY/CAT/MENU** button (2) to view the current PTY category.
2. Press the **TUNE/SEEK|<<** or **>>|** buttons to move through the list of available categories and select the program type you wish to search.
3. After selecting the desired PTY, press the **INFO/ENTER** button (16) to search the band for broadcasts of this type. “PTY Search” is displayed while the tuner is searching.

NOTE: Performing a PTY search on “ANY” will Seek Tune and stop on any station broadcasting RBDS, regardless of the program type.

Weather Band Operation

What is the NOAA Weather Radio/Weatheradio Canada?

NOAA (National Oceanic and Atmospheric Administration) is a nationwide system that broadcasts local weather emergency information 24 hours a day via the National Weather Service (NWS) network. The U.S. network has more than 530 stations covering the 50 states as well as the adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands and the U.S. Pacific Territories. Each local area has its own transmitting station and there are a total of seven broadcasting frequencies used. A similar system is available in Canada under the Weatheradio Canada service administered by Environment Canada.

Tuning to Weatherband

Press and hold the **BAND/WB** button (15) to access the Weatherband. The indication "WB" will appear on the display panel, along with the current number and channel indication: "WB-1", WB-2", "WB-3", "WB-4", "WB-5", "WB-6" or "WB-7". The seven frequencies are shown in the following table:

WB Frequencies

Frequency (MHz)	Preset
162.400	2
162.425	4
162.450	5
162.475	3
162.500	6
162.525	-
162.550	1

The above table also shows which preset button will access the frequency. Note that one frequency cannot be accessed using a preset button. The frequency can only be reached using the tuning controls.

Use the **TUNE/SEEK |<<** or **>>|** buttons (18, 19) or the preset buttons to tune to each of the seven channels until you find the weatherband station broadcasting in your area.

How many stations can I expect to receive?

Since the broadcasts are local weather and information, the transmission power is usually very low (much less than standard AM or FM stations) so you will usually receive only one station unless you are on the edge of two or more broadcast signals. The most you will receive will be two or three, and that is rare.

Is it possible I won't receive any stations?

Depending on where you are located, there is a possibility you will receive only a very weak signal or none at all. Also, similar to AM and FM signals, weatherband signals are subject to surrounding conditions, weather, obstructions of the signal by hills or mountains, etc.

NOAA Weather Alert

The Weather Alert function adds an additional level of user safety by automatically switching from any of the available function modes to weather band for a minimum of 60 seconds if a NOAA warning tone (1050 Hz) is received/detected. If no additional warning tone is received for 60 seconds, the unit will switch back to the last known function mode. See “System Menu” on page 6 to learn how to turn the WB Alert feature on.

SAME Decoding and Filtering

Specific Area Message Encoding (SAME) data is also broadcast prior to alert broadcasts. SAME data contains information about the geographic region affected by the alert, the type of alert, and its effective time. The geographic region included in the SAME data is called the Geographical Area code and has the form PSSCCC where “P” represents a portion of the county, “SS” is a two-digit state, territory, or offshore marine area identifier and “CCC” identifies the county, province, or major metropolitan area within the state. This unit can be configured through the system setting menu with up to seven Geographical Area codes to limit the automatic tuning or power on functions described above.

SAME data also includes the type of alert being broadcast. This unit can be configured through the System Setting Menu to limit the automatic tuning or power on functions based on the type of alert.

SAME is activated by programming a 6 digit code - called a FIPS code - into your radio. The FIPS code or Federal Information Processing System code is a six digit code that identifies the states and counties (or parishes) in the United States. The first digit identifies the county subdivision. The next two digits identify the state or territory, and the last three identify the county. The FIPS code for your area can be found by calling the NWS toll free number or visiting the web site.

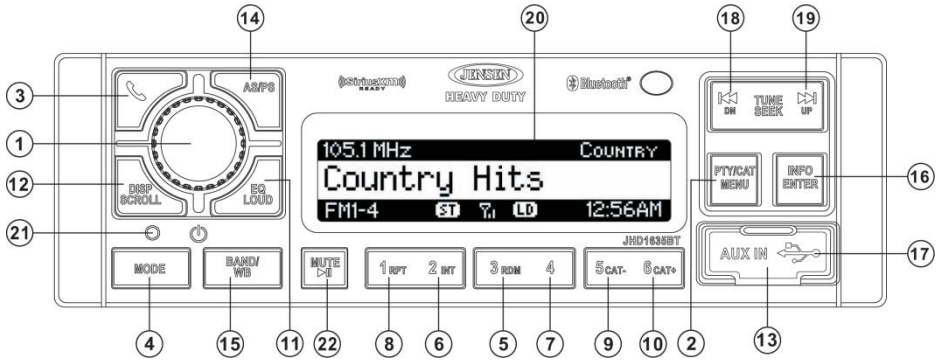
The phone number is 1-888-NWS-SAME (1-888-697-7263). Upon calling, an automated system will prompt you to enter your state and county. When you confirm the information, the system will provide your six digit FIPS code.

The web site is: www.nws.noaa.gov/nwr/indexnw.htm. Upon selecting your state from the chart, you will see a listing of all the counties in that state. For each county there is a listing of the SAME# (FIPS code), the location of the transmitter, the WB frequency, the call sign, the transmitter power and miscellaneous remarks.

NOTE: Because broadcast areas overlap you may want to set more than one S.A.M.E. location. If you live near the border between counties, you may want to receive alerts from more than one tower.

Your radio is capable of being programmed with up to 7 different FIPS location codes. The default code has been programmed at the factory - 000000 - to respond to all messages within your area.

USB OPERATION



Digital File Playback

If the user connects a USB mass storage device, the radio automatically powers on, if necessary, and switches to digital file playback mode. Changing modes or turning off the radio pauses playback. Playback shall resume exactly where paused when returning to digital file playback mode.

Inserting a USB Device

The front USB connector (17) and the rear USB connector work separately. The front USB connector is located at the bottom right of the front panel, behind a protective rubber cover. Pull gently to lower the rubber cover and reveal the USB slot. The rear USB connector is located at the back of the module. Insert a USB device at the front or rear USB connector to switch to USB mode and begin playback automatically. Only the current device can be charged.

When both front and rear USB connectors are connected to USB devices, press **MODE** (4) to select either front USB or rear USB to playback. If the non-playing device is pulled off, the playing device will continue the playback without any impact.

If the USB device is playing music with front USB connector, and then insert another device into the rear USB connector, the device connected via rear USB will begin music playback and the device connected via front USB will stop. Vice versa.

Controlling File Playback

Selecting Tracks

Press the **TUNE/SEEK >>|** (19) or **TUNE/SEEK |<<** button (18) to advance to the next track/ file. The selected track number will appear on the display. *Press and hold* the **TUNE/SEEK >>|** or **|<<** button to fast forward or fast reverse. Playback begins when the button is released.

Play/Pause Playback

Press the **MUTE/>||** button (22) to suspend playback. “Pause” is displayed on the screen. Press the **MUTE/>||** button again to resume play.

Previewing Tracks

Press the **2/INT** button (6) to play the first 10 seconds of each track in the current folder sequentially. Press **2/INT** again to stop Intro Scan and resume normal play at the current track.

Repeat Play

- Press the **1/RPT** button (8) during disc play to repeat the current track.
- Press **1/RPT** again to stop repeat play.

Random Play

- Press the **3/RDM** button (5) during playback to play all tracks in the current folder in random, shuffled order.
- Press **3/RDM** again to stop random play.

Folder Navigation (MP3 Only)

- Press the **PTY/CAT/MENU** button (2) to view a list of all songs in the current folder.
- Press the **>>| / UP** (19) and **|<< / DN** (18) buttons to navigate the list.
- Press the **INFO/ENTER** button (16) to play the highlighted song or view files in the selected folder. Continue pressing INFO/ENTER until the desired file is selected.
- Press the **PTY/CAT/MENU** button again to navigate up through the file structure.
- The unit will automatically exit the folder navigation menu after 5 seconds of inactivity.

MP3 Specifications

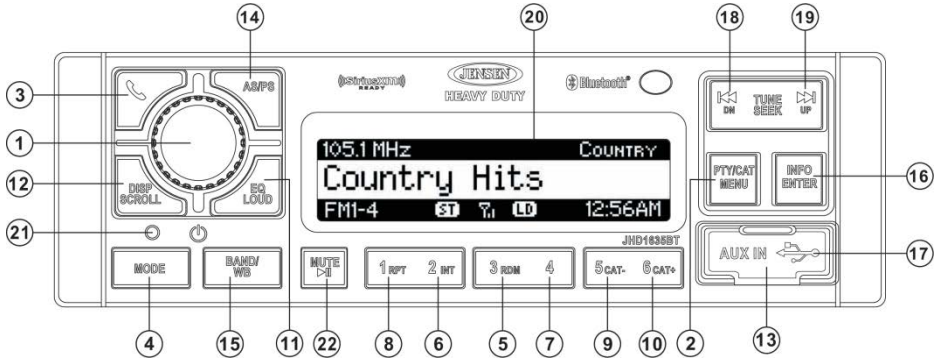
Notes on MP3 Playback

- Any directory that does not include an MP3 file is skipped
- Maximum number of folders: 512 (including skipped directories)
- Maximum number of folder levels: 12
- Maximum number of MP3 files: 999
- Maximum number of characters for MP3 file name and folder name: 32
- Maximum number of Characters of ID3 Tag:
  - ID3 Tag version 1.0: 32
  - ID3 Tag version 2.x: 32

File Playing Order

Files will be continually played sequentially within the current folder. To play songs in another folder, press the **PTY/CAT/MENU** button (2) twice to move up a folder level. Press the **>>| / UP** and **|<< / DN** buttons to navigate the list and then press the **INFO/ENTER** button (16) to access the selected song or folder.

SIRIUSXM™ RADIO OPERATION



NOTE: Only SiriusXM™ brings you more of what you love to listen to, all in one place. Get over 140 channels, including commercial-free music plus the best sports, news, talk, comedy and entertainment. Welcome to the world of satellite radio. A SiriusXM Vehicle Tuner and Subscription are required. For more information, visit www.siriusxm.com.

Accessing SIRIUSXM Mode (Requires optional SIRIUSXM tuner)

Press the **MODE** button (4) to change the mode to SiriusXM mode.

Accessing your SiriusXM ID

The SiriusXM ID is required for activation. To display your SiriusXM radio ID, use the **TUNE/SEEK |<<** (18) button to tune to channel "000". The screen will display "Radio ID" with the ID displayed in the middle of the LCD screen. The SiriusXM radio ID is 8 characters long and does not include the letters I, O, S, or F.

Selecting a Band

In SiriusXM mode, press the **BAND/WB** button (15) to access the SiriusXM user-preset channel groups in the following order: SXM1, SXM2, SXM3.

Category Tuning

1. Press the **PTY/CAT/MENU** button (2) to access Category mode.
2. While in category mode, press **5/CAT-** OR **6/CAT+** buttons (9, 10) to choose a category.
3. Press the **TUNE/SEEK |<< / >>|** buttons (18, 19) to navigate channels in that category. (The current channel number within the chosen category will always be the default first channel tuned.)
4. Press the **INFO/ENTER** button (16) to select the desired channel.

Channel Up/Down Tuning

Press the **TUNE/SEEK |<< / >>|** buttons to search for a channel. *Press and hold* the **TUNE/SEEK** buttons to fast search.

Direct Tuning Mode

1. *Press and hold* the **INFO/ENTER** button to enter direct tuning mode.
2. Press **TUNE/SEEK |<< / >>|** buttons to change the first of three digits for the desired channel in the direct entry screen.
3. Press the **INFO/ENTER** button to confirm the entered digit and move to the second digit field.
4. Press **TUNE/SEEK |<< / >>|** buttons to select the second digit.
5. Press **the INFO/ENTER** button to confirm the entered digit and move to the third digit field.
6. Press **TUNE/SEEK |<< / >>|** buttons to select the third digit.
7. Press the **INFO/ENTER** button to confirm the three digit channel and tune to the selected channel.

Storing Preset Channels

The preset buttons (5-10) can be used to store 6 channels, allowing convenient access to your favorite channels.

Programming Channels

1. Select the channel you want to store in memory.
2. *Press and hold* a preset button (5-10) until the corresponding preset button number appears.
3. Repeat steps 1 and 2 to program additional channels.

Preset Recall

Press one of the six preset buttons (5-10) to directly select a preset channel stored in the current band.

Preset Scan

Press **AS/PS** button (14) to scan stations stored in all three user-preset channel groups (SXM1, SXM2 and SXM3). The unit will pause for 10 seconds at each preset station.

Preset Tuning

In Preset Tuning Mode, you can use the **TUNE/SEEK |<< / >>|** buttons to access all 18 preset stations in sequential order. Access preset tuning mode through the system menu. Set Preset-Only Tuning to "ON."

Alternate Display Mode

Press the **DISP/SCROLL** button (12) to change the display information between single and dual line text display. In dual line mode, both artist and title are available for viewing.
Press and hold the **DISP/SCROLL** button to scroll the Artist/Song Title information.
While in category tuning list mode, press the **DISP/SCROLL** button in sequence to change the display information from Channel Name, Artist, and Song Title.

Satellite Signal Strength

The display will indicate satellite reception strength as shown below.

Signal Strength	Strength Display
No Signal	
Weak	
Good	
Excellent	

Channel Lock

Access Channel Lock through the System Menu under the “SiriusXM Satellite Radio” menu. See “System Menu” on page 6.

1. Select “Set Lock Code” and press the **INFO/ENTER** button (16).
2. Enter the default lock code of “0000”. To set the lock code:
   a. Press the **TUNE/SEEK |<< / >>|** (18, 19) buttons to enter the first digit of the default code.
   b. Press the **INFO/ENTER** button to move to the next digit.
   c. Repeat above steps to enter all 4 digits of the default code.
   d. Press the **TUNE/SEEK |<< / >>|** buttons to enter the first digit of the new code.
   e. Press the **INFO/ENTER** button to move to the next digit.
   f. Repeat above steps to enter all 4 digits.
   g. Repeat above steps to confirm the new code.
3. After setting a new four digit code, you can lock channels by entering the “Locked Channels” menu.
4. Upon entering the Locked Channels list, you will be prompted to enter your four digit code.
   a. Press the **TUNE/SEEK |<< / >>|** buttons to enter the first digit.
   b. Press the **INFO/ENTER** button to move to the next digit.
   c. Repeat above steps to enter all 4 digits.
5. After entering the code, you can navigate the list using the **TUNE/SEEK |<< / >>|** buttons to highlight the channels.
6. Press the **INFO/ENTER** button to Lock (indicated by a icon) or Unlock the selected channel.

Reset SiriusXM Channel Lock Code

If you forget your Parental Control lock code, use the following directions to reset the code to the default “0000”. Resetting the lock code will not affect the locked channels list.

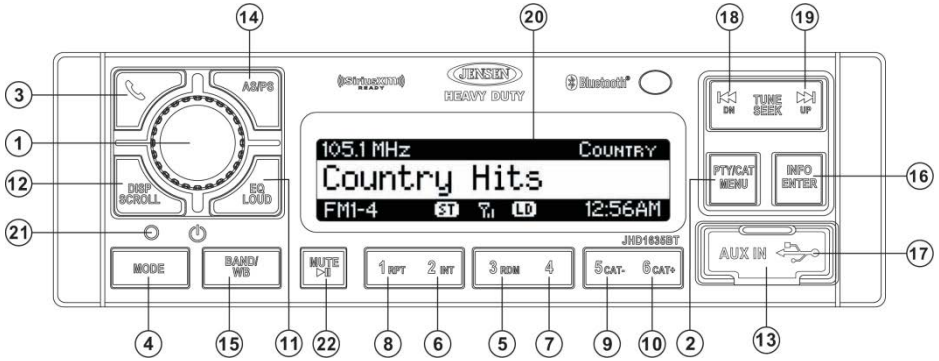
1. In SiriusXM mode, tune to Channel 0
2. Set volume to 0.
3. *Press and hold* the rotary encoder (1) to power off the unit.
4. With power off, *press and hold* the volume knob until the system version info is displayed on the screen
5. Press the **Preset 3** (5) button, screen will return to the clock.
6. Press the rotary encoder to power on the unit.
7. The lock code has now been reset to “0000”

Advisory Messages Reported by the SiriusXM Vehicle Tuner

On-Screen Display	Advisory Message	Cause	Explanation/Solution
Check Antenna	Check Antenna	The radio has detected a fault with the SiriusXM antenna. The antenna cable is either disconnected or damaged.	• Verify that the antenna cable is connected to the SiriusXM Connect Vehicle Tuner. • Inspect the antenna cable for damage and kinks. Replace the antenna if the cable is damaged.
Check Tuner	Check Tuner	• The radio is having difficulty communicating with the SiriusXM Connect Vehicle Tuner. • The tuner may be disconnected or damaged.	• Verify that the SiriusXM Connect Vehicle Tuner cable is securely connected to the radio SiriusXM mating connector/ cable. • If the problem persists, disconnect and reconnect the tuner and then contact your dealer.
No signal	No signal	The SiriusXM Connect Vehicle Tuner is having difficulty receiving the SiriusXM satellite signal.	• Verify that your vehicle is outdoors with a clear view of the southern sky. • Verify that the SiriusXM magnetic mount antenna is mounted on a metal surface on the outside the vehicle. • Move the SiriusXM antenna away from any obstructions. • Inspect the antenna cable for damage and kinks. Replace the antenna if the cable is damaged. • If the problem persists, disconnect and reconnect the tuner and then contact your dealer.
Scrolling “Subscription Updated” – press any key to continue”	Subscription Updated	The radio has detected a change in your SiriusXM subscription status.	• Press any key to clear the message. • No further action is required. • Questions about your subscription in the United States please visit www.siriusxm.com/activatenow or call SiriusXM Listener Care at 1-866-635-2349 • Questions about your subscription in Canada, please visit www.siriusxm.ca/activatexm or call XM Listener Care at 1-877-438-9677
Chan Unavailable	Channel Not Available	The channel that you have requested is not a valid SiriusXM channel or the channel that you were listening to is no longer available. You may also see this message briefly when first connecting a new SiriusXM Connect Vehicle tuner. Visit www.siriusxm.com for more information about the SiriusXM channel lineup.	Visit www.siriusxm.com/channellineup for more information about the SiriusXM channel lineup.
Ch Unsubscribed	Channel Not Subscribed	The channel that you have requested is not included in your SiriusXM subscription package or the channel that you were listening to is no longer included in your SiriusXM subscription package.	• Questions about your subscription in the United States please visit www.siriusxm.com/activatenow or call SiriusXM Listener Care at 1-866-635-2349. • Questions about your subscription in Canada please visit www.siriusxm.ca/activatexm or call XM Listener Care at 1-877-438-9677.

On-Screen Display	Advisory Message	Cause	Explanation/Solution
Chan Locked	Channel Locked	The channel that you have requested is Locked by the radio Parental Control feature.	See the section on Parental Control, page 12 for more information on the Parental Control feature and how to access locked channels.
Enter Code: _ _ _ _	Enter Lock Code	User prompted to enter the lock/unlock code.	Enter the four digit code to unlock the channel
Wrong Code	Invalid Lock Code	The unlock code entered by the user is incorrect	• Input the correct four digit code to unlock the channel. • Reset lock code to default following instructions on page 12

iPod® OPERATION



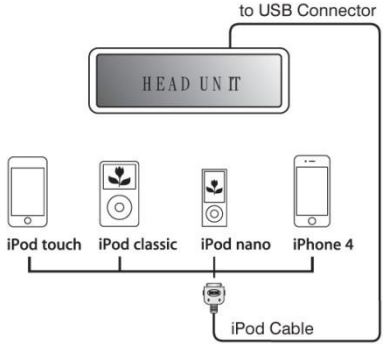
This unit is equipped with an iPod ready function that will allow you to control your iPod (if compatible) using the control panel buttons. The following iPod versions are supported:

- iPod Nano 5G, 6G, 7G
- iPod Classic
- iPhone 4, 4S, 5
- iPod Touch 3G, 4G, 5G

NOTE: Earlier model iPod's are not supported because they do not implement the required control protocol. Also, the iPod shuffle is not supported because it does not utilize the 30-pin Apple iPod Connector. These unsupported iPod models may be connected to the radio using one of the Auxiliary Inputs.

Accessing iPod Mode

Connect a supported iPod or iPhone to the front panel USB (or Rear USB) connector. The iPod icon illuminates in the bottom left corner of the LCD whenever an iPod or iPhone is attached to the USB connector. Music playback begins automatically. To enter iPod mode from any other source, press the **MODE** button (4) until "iPod" appears on the display. If the user connects an iPod containing no songs, the radio will display a message stating "No Songs" in iPod mode.



Turning the iPod On/Off

The iPod power turns on automatically when it is connected to the front panel USB port, as long as the vehicle ignition is turned on. You can turn the iPod off by disconnecting it or by turning the ignition off. When the ignition is off, the iPod will pause and then enter sleep mode after 2 minutes. While the iPod is connected, the power cannot be turned on or off from the iPod itself.

Controlling Playback

Pausing Playback

During playback, press the **MUTE/>||** button (22) to pause the iPod player. "Pause" will appear on the LCD. Press **MUTE/>||** again to resume playback.

Repeat Play

During playback, press the **1/RPT** button (8) to repeat the current song. "RPT" will appear on the LCD. Press **1/RPT** again to stop repeat playback.

Random Play

During playback, press the **3/RDM** button (5) to play all songs in the current category in random order. Random play will begin once the current song has finished playing. "RDM" will appear on the LCD. Press **3/RDM** again to stop random playback.

Selecting Tracks

During playback, press the **TUNE/SEEK |<< / >>|** buttons (18, 19) to play the previous or next track in the current category. Press the **TUNE/SEEK |<<** button once to play the song from the start position or press **TUNE/SEEK |<<** twice to play the previous track. Pressing the **TUNE/SEEK |<<** button during the first 2 seconds of a track will play the previous track. After 2 seconds, this action returns to the beginning of the current track.

Press and hold the **TUNE/SEEK |<< / >>|** button to fast reverse/forward the song.

NOTE: If you press and hold the TUNE/SEEK |<< / >>| button to change the current song to the previous/next song, you will exit fast reverse/forward mode.

Alternate Display Mode

Press **the DISP/SCROLL** button (12) to change the display information between single and double line text display.

Playlist Search

Press the **PTY/CAT/MENU** button (2) to access Playlist selection mode. While in Category mode, press the **TUNE/SEEK |<< / >>|** buttons to choose file search by Playlist, Artist, Album, Genre, Song, Audiobook or Podcast. Press the **INFO/ENTER** button (16) to select the search mode. Use the **TUNE/SEEK |<< / >>|** buttons to search the available files on the iPod. Press the **INFO/ENTER** button to play the selected song or file.

BLUETOOTH OPERATION

The JHD1635BT includes built-in Bluetooth technology that allows you to connect this head unit to Bluetooth devices for streaming audio playback.

About Bluetooth Technology

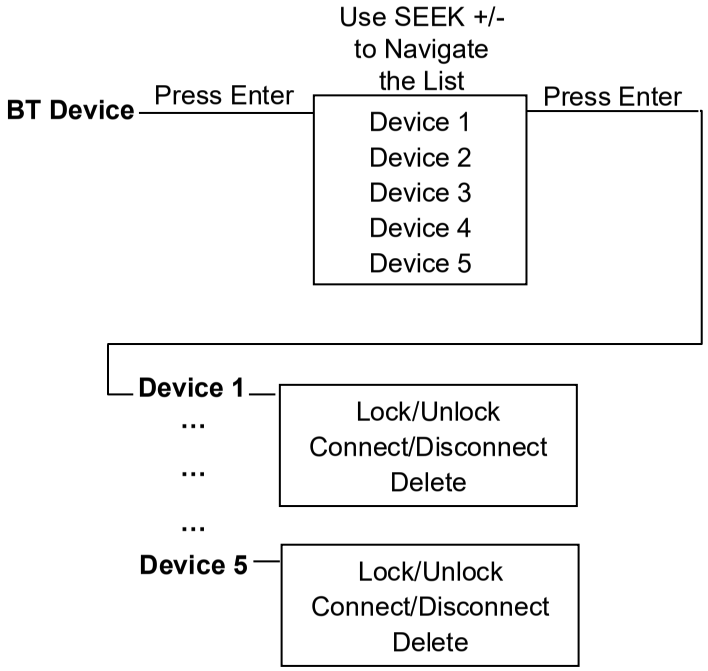
Bluetooth is a short-range wireless radio connectivity technology developed as a cable replacement for various electronic devices. Bluetooth operates in 2.4 GHz frequency range and transmits voice and data at speeds up to 2.1 Mbit/s over a range of up to 10 meters.

Bluetooth Menu Options

NOTE: Please note that some BT menu options are only available while the unit is in Bluetooth Audio mode.

Press and hold the **PTY/CAT/MENU** button (2) to enter menu adjustment mode. Press the **SEEK/TUNE** buttons (18, 19) repeatedly to view the Bluetooth Setup Menu options. Press ENTER to choose the highlighted option.

- **BT ON/OFF**: Press the **ENTER** button (16) to select "BT ON" or "BT OFF". When “On”, the LCD will display the Bluetooth icon (default “BT ON”).
- **BT HFP Volume**: Press the **ENTER** button repeatedly to adjust the ring volume from 0-40 (default 35/previous setting).
- **BT Device List**: Press the **ENTER** button to view a list of previously paired mobile phone device models. Press the **SEEK/TUNE** buttons (18, 19) to view devices from the list. You cannot delete a device that is actively connected. Press the ENTER button to select the device. Press the **SEEK+** or **SEEK-** button to choose Lock/Unlock, Disconnect or Delete for this device.
  - LOCK/UNLOCK: The JHD1635BT can store up to 5 devices for Bluetooth connection. The devices are stored in FIFO (First in First Out) order. To prevent a device from being bumped from the list when more than 5 devices are used, you must lock the device. To lock/Unlock a device, press the **ENTER** button to display/change the Locked or Unlocked icon.
  - DISCONNECT: To disconnect a paired device, press the **ENTER** button to temporarily remove the Bluetooth link. The link can be re-established through your phone menu by selecting the JHD1635BT for connection.
  - DELETE: To delete a device from the list, press the **ENTER** button. NOTE: Device must be disconnected to be deleted.
- **BT Pair:** Press the **ENTER** button to turn BT Pair “On” to put the unit pairing mode to search for and be discovered by Bluetooth devices.
- **BT Auto Answer**: Press the **ENTER** button to turn the Auto Answer function “On” or “Off”.



Pairing a Bluetooth Device

Before you begin, consult the owner’s manual for the Bluetooth device you want to pair with the JHD1635BT.

1. Make sure the device is on and ready to receive a signal from the JHD1635BT. With the JHD1635BT in Bluetooth Audio mode, choose “BT Pair” from the JHD1635BT menu and press the **ENTER** button (16) to begin pairing. The unit is now waiting to connect to a mobile phone device. With the Bluetooth function of the mobile phone device turned on, search for a Bluetooth device.
2. When the Bluetooth device has completed its search, the mobile phone will display the Bluetooth device name (JHD1635BT).
3. Select JHD1635BT. The Bluetooth icon will appear on the radio LCD.
4. Enter the pairing password (0000), if requested.

After connecting successfully, you will be able to listen to music stored on your Bluetooth enabled device through the radio.

BT Audio (A2DP)

The A2DP music is available for Bluetooth enabled phones when the phone is connected. To access Bluetooth mode and play songs stored on your phone, press the **MODE** button (4). While in Bluetooth mode, the Bluetooth Audio icon will appear on the LCD.

Selecting Tracks

During playback, press the **SEEK/TUNE** (18, 19) buttons to play the previous or next track.

Pausing Playback

During playback, press the **MUTE/>||** button (22) to pause the Bluetooth AUDIO player. “BT AUDIO PAUSE” will appear on the LCD. Press **MUTE/>||** again to resume playback. If you change to another mode, the mobile phone audio will pause. Press the **MODE** (4) button to return to Bluetooth mode and resume mobile phone audio playback.

NOTE: If a Bluetooth device is disconnected due to the power being turned off or if the device is disconnected inadvertently, the unit will automatically search for the matching Bluetooth device when the power is restored.

Incoming/Outgoing calls

While the mobile device is connected through Bluetooth, the phone number for incoming calls will appear on the LCD. The incoming ring will be output through the unit unless the unit is broadcasting a Weather Band Alert or the PA system is in use.

Answer Call

If the Bluetooth Auto Answer function is turned “Off”, the user must press the "**CALL**" button (3) to receive and incoming call.

If the BT Auto Answer function is turned “On”, the unit will automatically receive the incoming call after 5 seconds of ringing.

While the microphone (JMICHFP) is connected to the unit, the user can answer incoming calls through the Microphone.

Transfer Call

During the call, *press and hold* the "**CALL**" button transfer the call between the unit and the mobile device.

End Call

Press the “**CALL**” button to end a call. The unit will return to the previous mode.

Reject Incoming Call

To reject an incoming call, press and hold the “**CALL**” button.

CARE AND MAINTENANCE

- Keep the product dry. If it does get wet, wipe it dry immediately. Liquids might contain minerals that can corrode the electronic circuits.
- Keep the product away from dust and dirt, which can cause premature wear of parts.
- Handle the product gently and carefully. Dropping it can damage circuit boards and cases, and can cause the product to work improperly.
- Wipe the product with a dampened cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the product.
- Use and store the product only in normal temperature environments. High temperature can shorten the life of electronic devices, damage batteries, and distort or melt plastic parts.

Ignition

The most common source of noise in reception is the ignition system. This is a result of the radio being placed close to the ignition system (engine). This type of noise can be easily detected because it will vary in intensity of pitch with the speed of the engine.

Usually, the ignition noise can be suppressed considerably by using a radio suppression type high voltage ignition wire and suppressor resistor in the ignition system. (Most vehicles employ this wire and resistor but it may be necessary to check them for correct operation.) Another method of suppression is the use of additional noise suppressors. These can be obtained from most CB radio or electronic supply shops.

Interference

Radio reception in a moving environment is very different from reception in a stationary environment (home). It is very important to understand the difference.
AM reception will deteriorate when passing under a bridge or when passing under high voltage lines. Although AM is subject to environmental noise, it has the ability to be received at great distance. This is because broadcasting signals follow the curvature of the earth and are reflected back by the upper atmosphere.

TROUBLESHOOTING

Symptom	Cause	Solution
No power	The vehicle's accessory switch is not on	If the power supply is properly connected to the vehicle's accessory terminal, switch the ignition key to "ACC".
	Fuse is blown	Replace the fuse.
No sound	Volume too slow	Adjust volume to audible level.
	Wiring is not properly connected	Check wiring connections.
The operation keys do not work	Control panel is not properly installed	Reinstall control panel.
	Built-in microcomputer is not operating properly due to noise	Press the **RESET** button.
Cannot tune to radio station, auto-seek does not work	Antenna cable is not connected	Insert the antenna cable firmly.
	Signals are too weak.	Select a station manually.
ERROR-01 on LCD	Database or decoder error	Change to another mode.
ERROR-02 on LCD	No songs on device	Remove device and add songs.
ERROR-03 on LCD	Abnormal current to USB device	Change mode or unplug and reconnect USB device.
ERROR-04 on LCD	iPod/iPhone is not verified	Unplug and reconnect iPod/iPhone.

SPECIFICATIONS

USB

Signal to Noise Ratio. . . . . > 65 dB
Channel Separation . . . . . More than 50 dB
Frequency Response . . . . . 20 Hz - 20 kHz

FM Radio

Frequency Coverage (USA) . . . . . 87.5 to 107.9 MHz
Frequency Coverage (Europe) . . . . . 87.5 to 108 MHz
Sensitivity (S/N = 30dB) 2.2µV
Stereo Separation . . . . . >25 dB

AM/MW

Frequency Range (USA) . . . . . 530-1710 kHz
Frequency Range (Europe) . . . . . 522-1620 kHz
Sensitivity (S/N=20dB) . . . . . 30 dB

General

Frequency band(s) (for Bluetooth) . . . . . 2.4~2.4835GHz
Maximum radio-frequency power transmitted (for Bluetooth) . . . . . 4 dBm
Operating Voltage . . . . . DC 12 Volts
Grounding System . . . . . Negative Ground
Speaker Impedance . . . . . 4-8 ohms per channel
Tone Controls:
  Bass (at 100 Hz) . . . . . ±10 dB
  Treble (at 10 kHz) . . . . . ±10 dB
Power Output . . . . . 45W x 4
Idle/Standby Current . . . . . 0 A
Current Drain. . . . . 15 Ampere Max
Dimensions . . . . . 175 (W) x 175 (D) x 50 (H)

FCC Notes

WARNING! Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

ASA Electronics Corporation

www.asaelectronics.com
www.jensenheavyduty.com

v.090217

SECTION 9

Caterpillar Engine.
Operation and Maintenance

SECTION 10

Engine Information Center (EIC).
User Manual