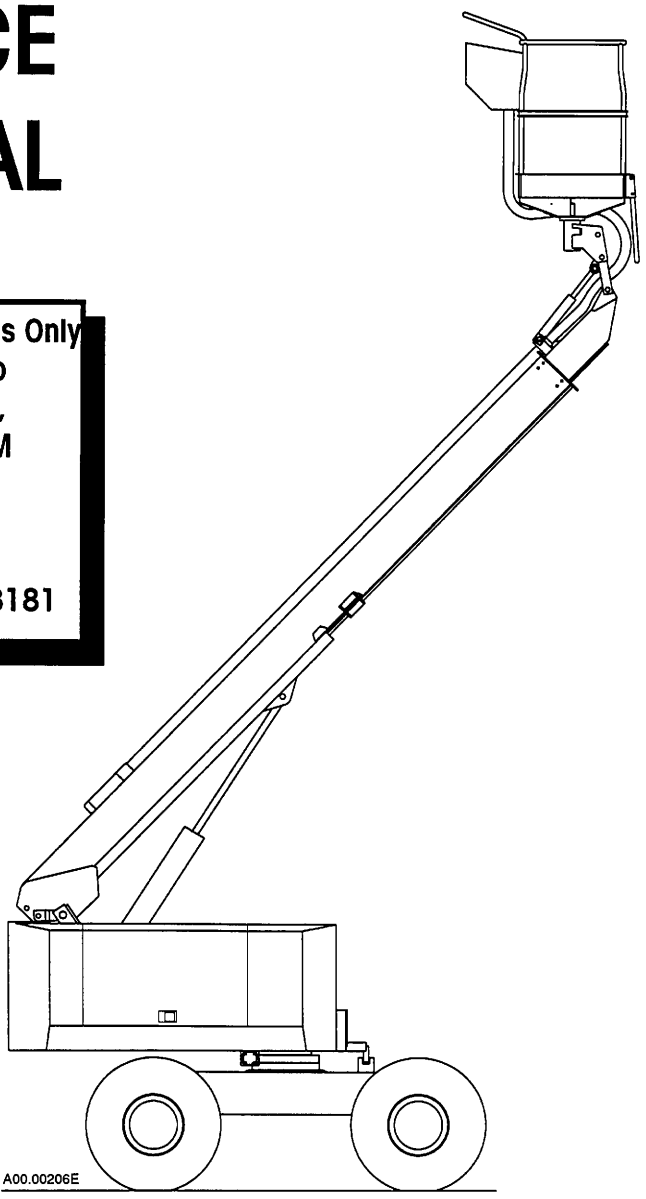
TRAILBLAZER 40

SERVICE MANUAL

For Service Concerns Only
Direct Phone Line to
Service Department,
8:00 AM to 5:00 PM
Central Time,
Monday thru Friday.

Phone (414) 355-3181



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INTRODUCTION

This Service Manual is designed to provide you with the instructions needed to properly maintain the SIMON AERIALS INC. Trailblazer 40 Aerial Platform with full hydraulic controls. When used in conjunction with the Operators and Parts manuals (provided separately) this Service Manual will assist you in making necessary adjustments or repairs.

Simon Aerials Mobile Platforms are designed and built to provide many years of safe, dependable service. To obtain full benefits from your Trailblazer, always follow the proper operating and maintenance procedures. Only trained, authorized personnel should be allowed to operate or service this machine. Service personnel should read and study the Operators, Service and Parts Manuals in order to gain a thorough understanding of the unit prior to making any repairs. Exercise all necessary safety precautions when performing maintenance not covered in this manual.

To help you recognize important safety information, we have identified warnings and instructions that directly impact on safety with the following signals:

⚠ DANGER

"DANGER" INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY. THIS SIGNAL WORD IS TO THE MOST EXTREME SITUATIONS.

⚠WARNING

"WARNING" INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.

⚠ CAUTION

"Caution" indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It is also used to alert against unsafe practices which could lead to property-damage-only accidents.

Service personnel and machine operators must understand and comply with all warnings and instructional decals on the body of the machine, and at the ground controls and platform control console.

⚠ DANGER

MODIFICATIONS OF THIS MACHINE FROM THE ORIGINAL DESIGN AND SPECIFICATION WITHOUT WRITTEN PERMISSION FROM SIMON ARE STRICTLY FORBIDDEN. A MODIFICATION MAY COMPROMISE THE SAFETY OF THE MACHINE, SUBJECTING USERS TO SERIOUS INJURY OR DEATH. ANY SUCH MODIFICATION WILL VOID ANY REMAINING WARRANTY.

Simon reserves the right to change, improve, modify or expand features of its equipment at any time. Specifications, models or equipment are subject to change without notice, and without incurring any obligations to change, improve, modify or expand features of previously delivered equipment.

Any procedures not found within this manual must be evaluated by the individual to assure himself that they are "proper and safe", because all possible procedures cannot be covered.

All Simon manuals are periodically updated to reflect changes that occur in the equipment. Please contact the factory with any questions you may have regarding your machine, or the availability of more recent manuals.

MACHINE SPECIFICATIONS

Working Height (Max.)	**46 Ft/** 14.02 M
Platform Height (Max.)	**40 Ft/** 12.19 M
Horizontal Reach (Max.)	**28 Ft 4 In./** 8.64 M
Platform Capacity (Unrestricted) (Max.)	**500 Lbs./** 227 Kg
Platform Size	**30 In. x 60 In. x 43.50 In./** .76 M x 1.52 M x 1.10 M
Stowed Length	**21 Ft/** 6.40 M
Stowed Height	**91.6 In./** 2.33 M
Machine Width	**94 In./** 2.39 M
Superstructure Width	**84 In./** 2.13 M
Wheelbase	**75 In./** 1.91 M
Tailswing Radius (Max.)	**33 In./** .84 M
Outside Curb Clearance Radius	**14 Ft 4 In./** 4.37 M
Maximum Travel Speed:	
Boom Stowed	**3 MPH/** 4.83 KPH
Boom Extended	**0.5 MPH/** 0.8 KPH
Ground Clearance (Rear Axle)	**12.5 In./** 33 cm
Gross Weight (Approx.)	**11,600 Lbs./** 5,262 Kg
Gradeability (Max.)	**18°/** 34% (On Hard Surface)
Platform Rotation	**180°**
Rotary Actuator End Cap Torque	**Ft Lbs./** Nm/ Kg-m
Superstructure Rotation	**360° Non-continuous**
Tire Size	**15" x 38.5"-16.5" (Liquid Ballasted)**
Tire Pressure	**55 PSI/** 3.79 Bar/ 3.86 Kg-cm^2
Wheel Lug Nut Torque (Lubricated)	**65 Ft Lbs./** 88.4 Nm/ 9.0 Kg-m
Swing Bearing Bolt Torque (Lubricated)	**170 Ft Lbs./** 231 Nm/ 23.5 Kg-m
Drive Motor Bolt Torque (Front Wheels) (Lubricated)	**65 Ft Lbs./** 88.4 Nm/ 9.0 Kg-m
Rear Axle Drive Motor Torque	**65 Ft Lbs./** 88.4 Nm/ 9.0 Kg-m
Maximum Hydraulic Pressure	**3000 PSI/** 207 Bar/ 211 Kg-cm^2
Hydraulic Tank Capacity	**40 Gal./** 151.4 Liters
Fuel Tank Capacity	**40 Gal./** 151.4 Liters
Electrical System	**12 Volt DC, Negative Ground, 95 Amp. Hr., Battery**

Engine Availability:

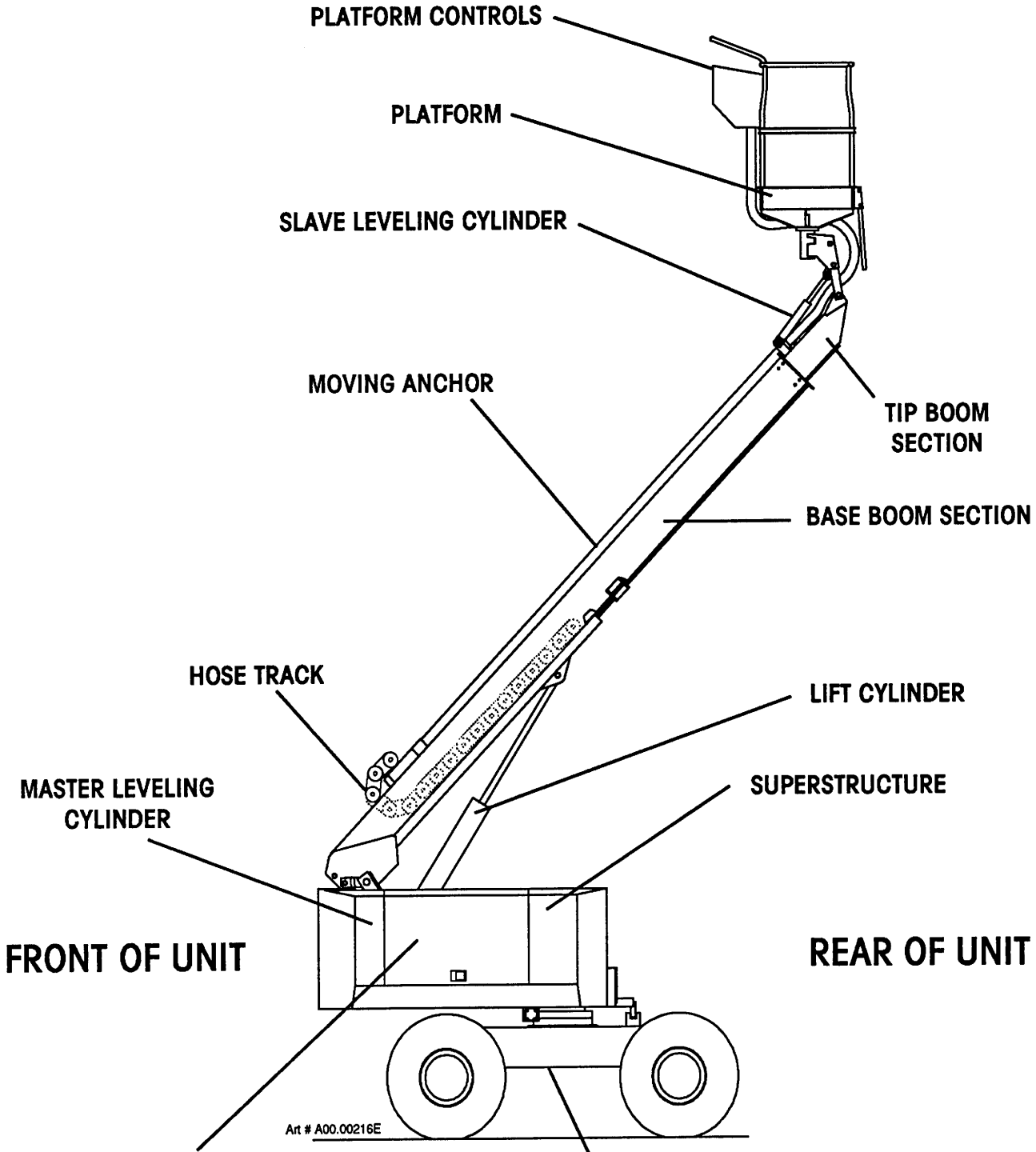
Standard . . . **Wisconsin W4-1770, 35 HP** (26.1 Kw), **Air Cooled, Gasoline**

Optional . . . **Wisconsin W4-1770, 35 HP** (26.1 Kw), **Air Cooled, Dual Fuel**

Deutz F3L 1011, 42 HP (31.3 Kw), **Air Cooled, Diesel**

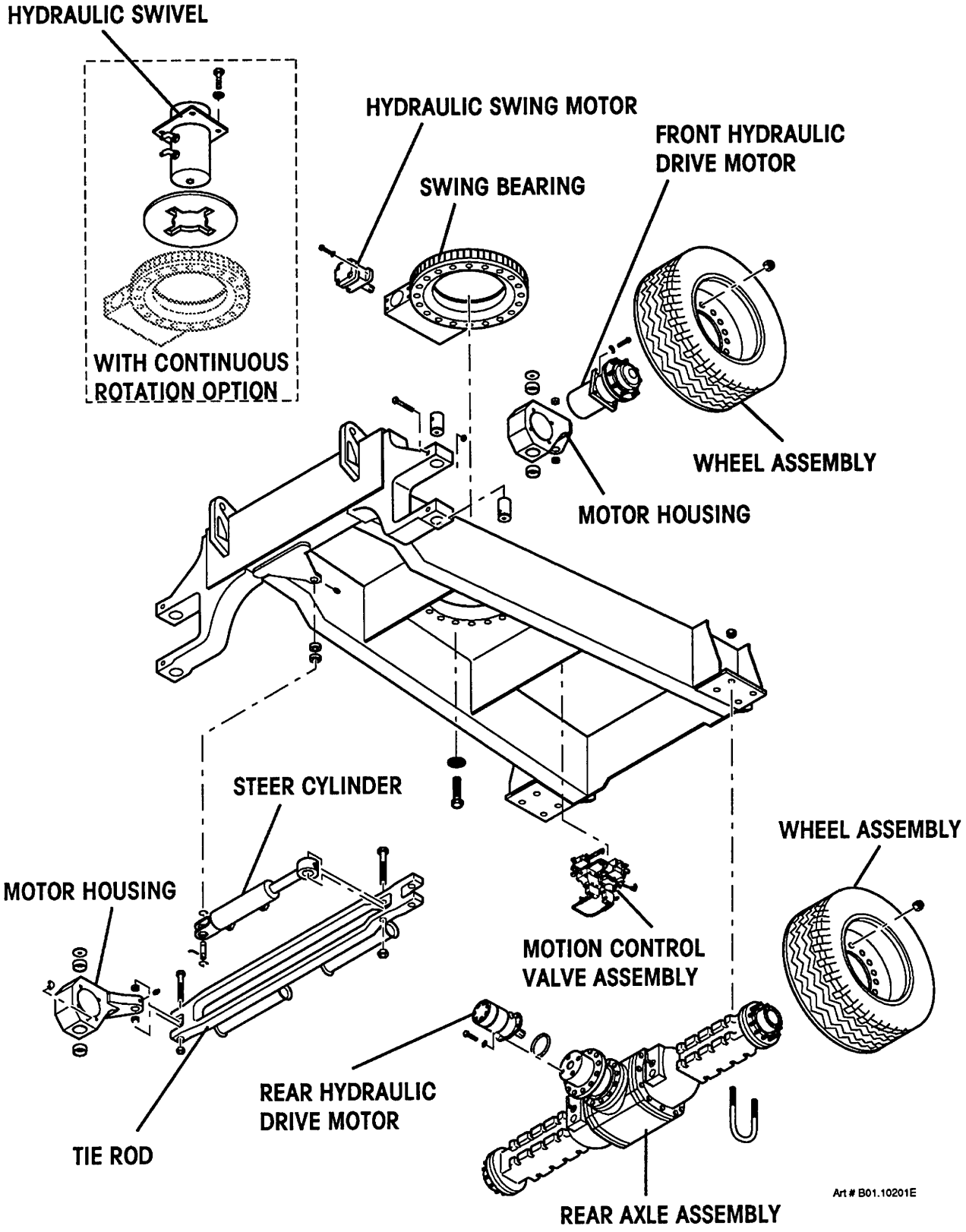
Ford LSG 423, 63 HP (47.0 Kw), **Liquid Cooled, Gas or Dual Fuel**

MACHINE COMPONENT LOCATOR

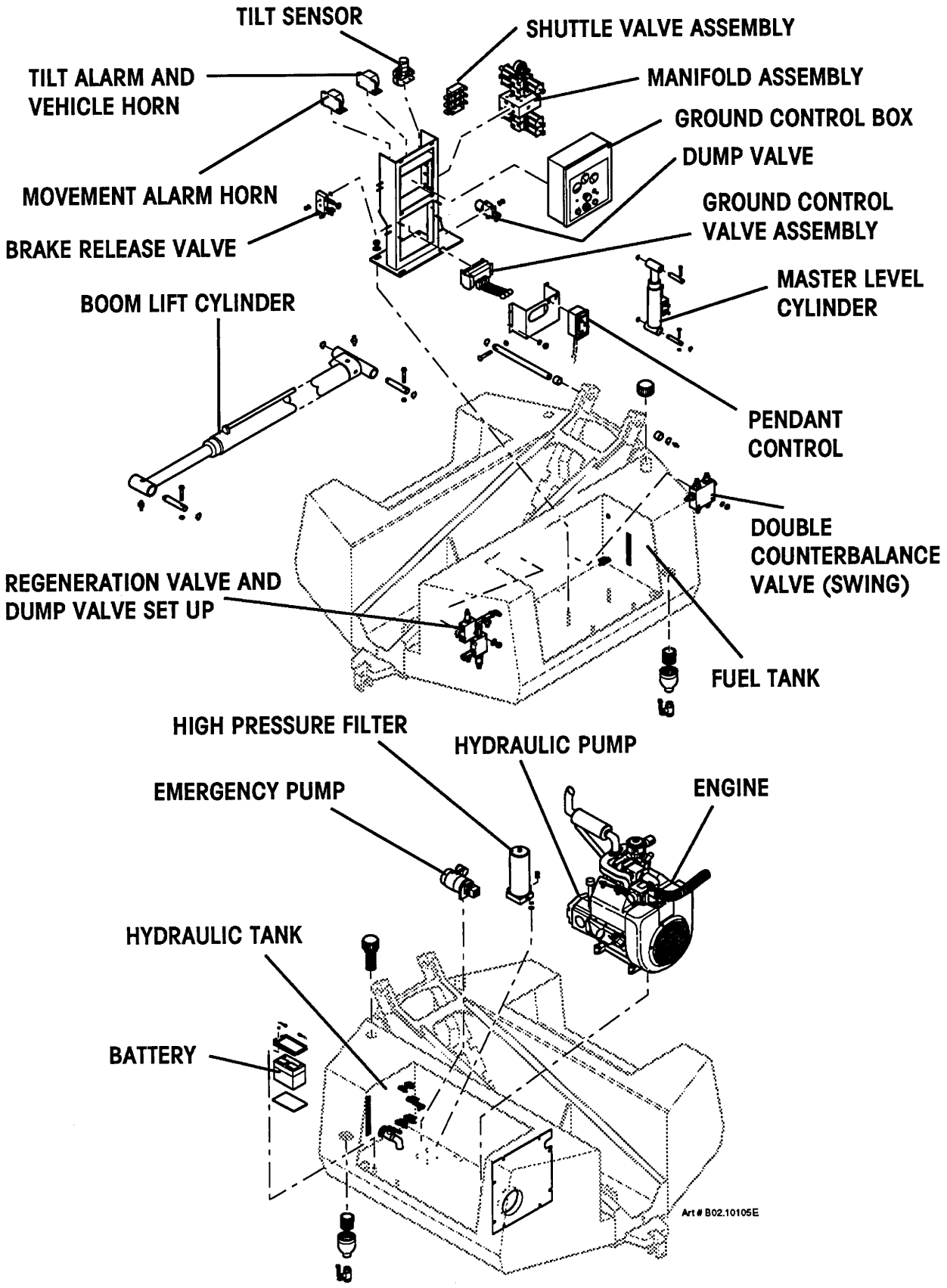


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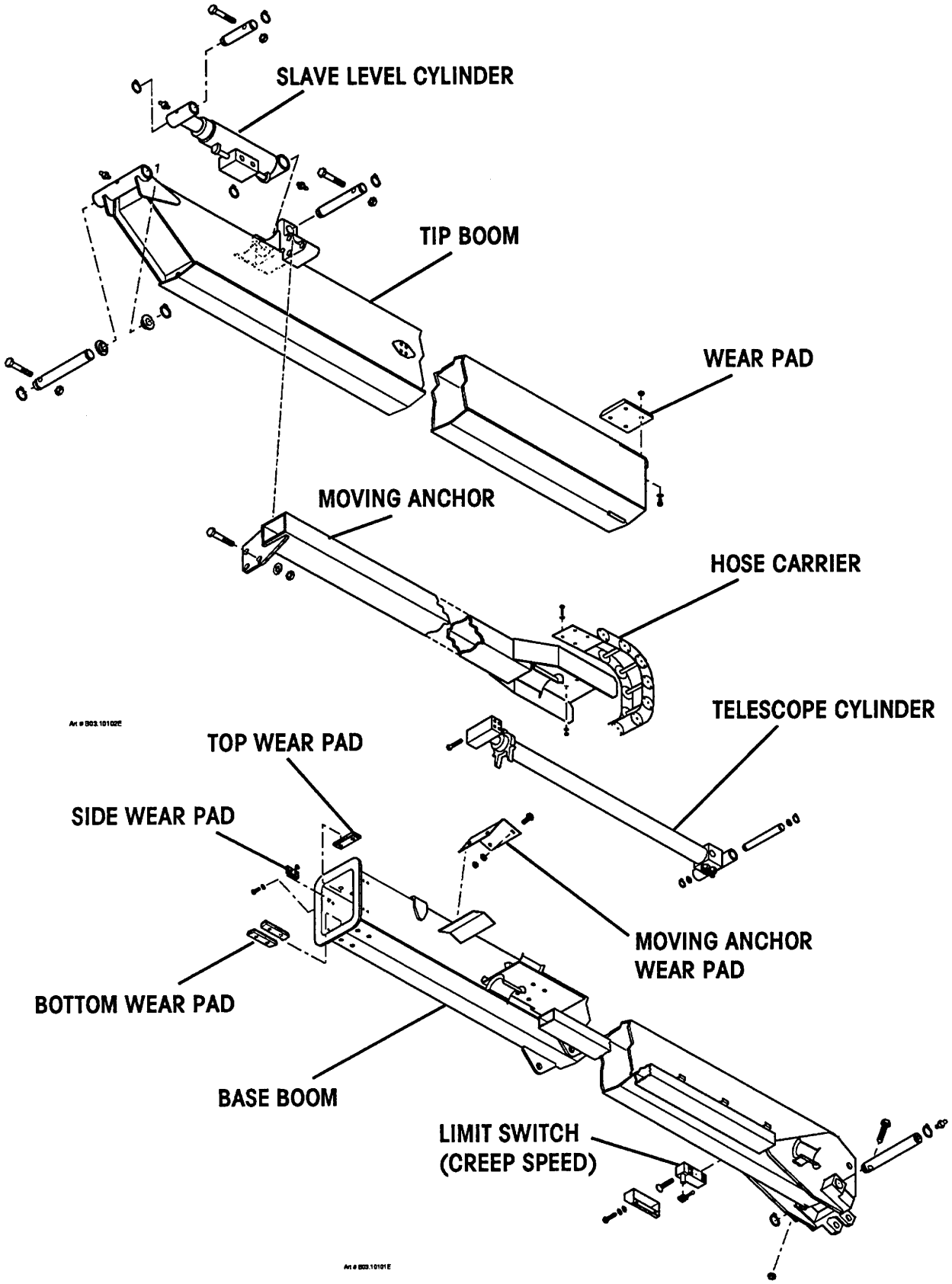
UNDERCARRIAGE COMPONENT LOCATOR



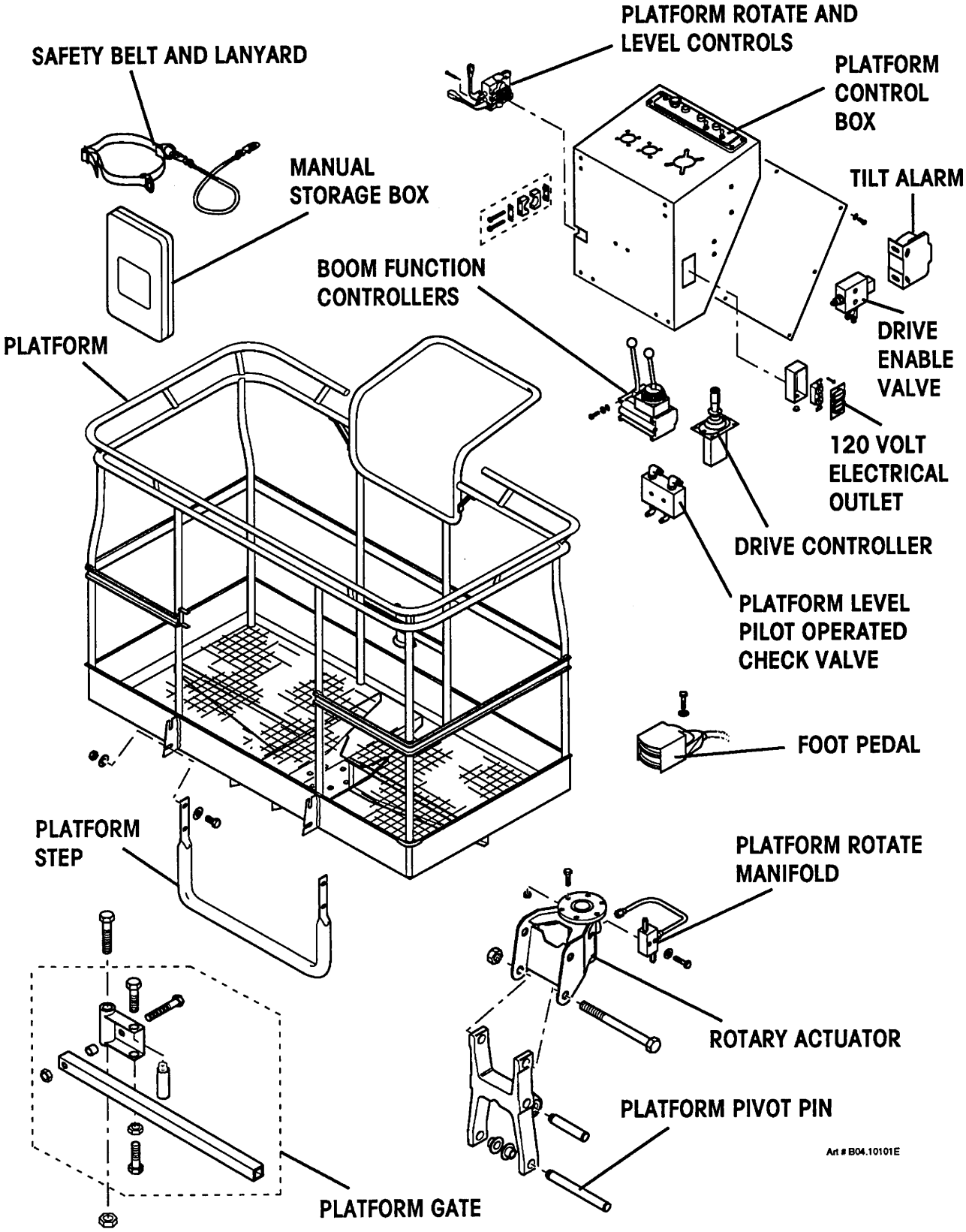
SUPERSTRUCTURE COMPONENT LOCATOR



BOOM COMPONENT LOCATOR



PLATFORM COMPONENT LOCATOR



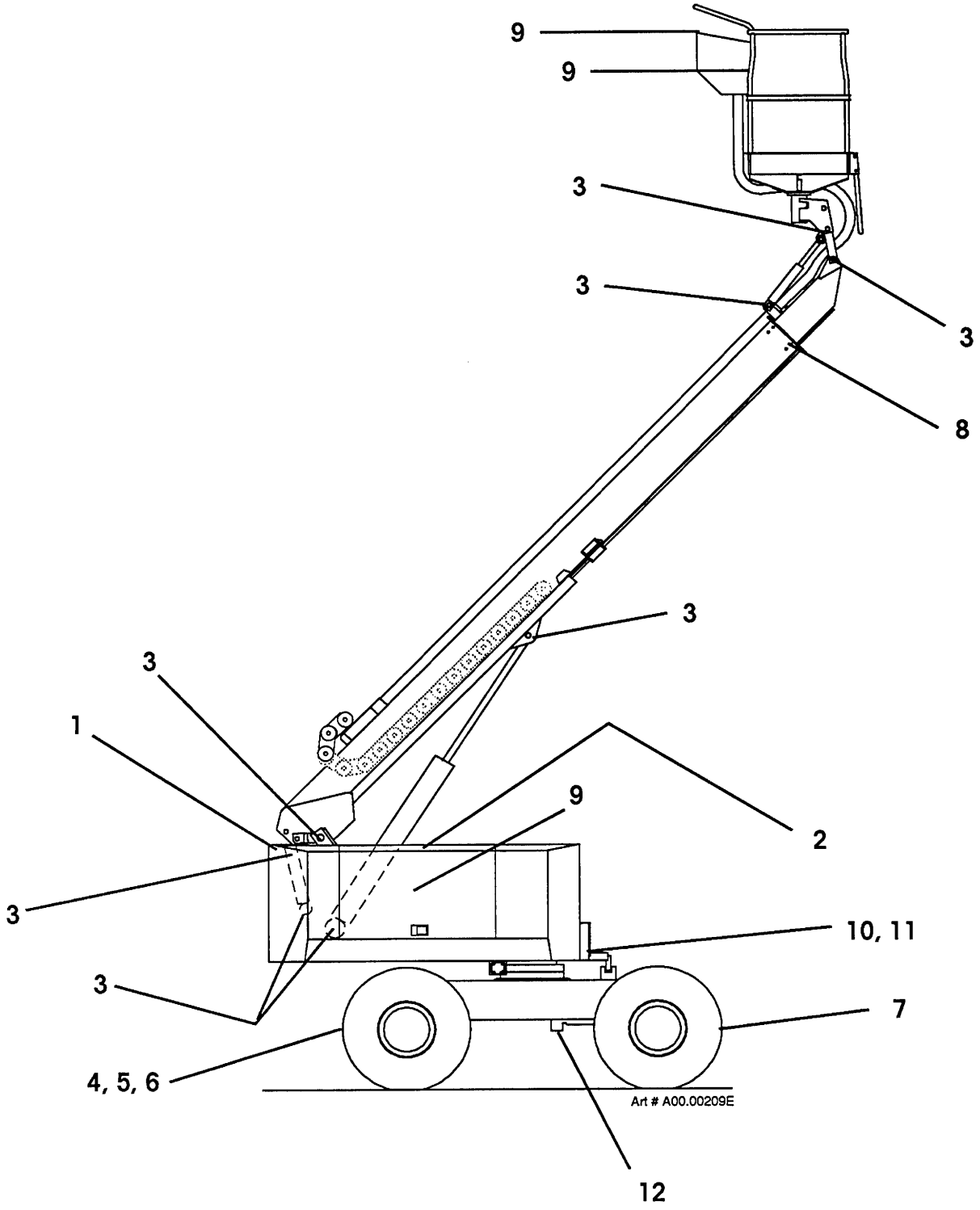
LUBRICATION CHART

NO.	ITEM	SPECIFICATION AND QUANTITY	FREQUENCY OF LUBRICATION
1.	Hydraulic reservoir	Mobil DTE-15 to "Full" mark with machine in stowed position.	Check daily, Analyze every 6 months or 500 hours.*†, Change yearly or every 1,000 hours.*†
2.	High pressure filter	Filter element.	Change every 6 months or 500 hours.*†
3.	Boom pivot pin and cylinder pins	Lithium N.L.G.I. #2 EP. Purge old grease.	Monthly or every 100 hours.*†
4.	Steering spindles (king pin bearings)	Lithium N.L.G.I. #2 EP. Purge old grease.	Monthly or every 100 hours.*†
5.	Steering cylinder bearings	Lithium N.L.G.I. #2 EP. Purge old grease.	Monthly or every 100 hours.*†
6.	Tie rod bearings	Lithium N.L.G.I. #2 EP. Purge old grease.	Monthly or every 100 hours.*†
7.	Axle and planetary ends	SAE 80/ 90 APIGL5	Check monthly.*† Change yearly or every 1,000 hours.*†
8.	Boom wear pads	Silicone spray.	Monthly or every 100 hours.*†
9.	Platform level and rotate valve lever pins; Boom function controls	WD 40 Spray or equivalent penetrating oil.	Monthly or every 100 hours.*
10.	Swing bearing	Lithium N.L.G.I. #2 EP. Purge old grease.	Monthly or every 100 hours.*†
11.	Swing bearing teeth	"Keystone -Moly 29 Open Gear Compound" Coat gear faces.	Monthly or every 100 hours.*†
12.	Drive shaft, U-joints and slip joints (if so equipped)	Lithium N.L.G.I. #2 EP. Purge old grease.	Monthly or every 100 hours.*†

* Whichever occurs first.

† Different requirements for severe duty applications. See check lists.

LUBRICATION DIAGRAM



SECTION 1: TRANSPORTATION AND EMERGENCY PROCEDURES

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Unpowered Emergency Movement 1-5
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TRANSPORTING THE UNIT

⚠WARNING

ALWAYS USE A WINCH TO ASSIST LOADING OR UNLOADING THE UNIT FROM A TRUCK OR TRAILER. WE DO NOT RECOMMEND UNASSISTED LOADING OR UNLOADING OF ANY MOBILE PLATFORM.

READ AND UNDERSTAND ALL SAFETY, CONTROL AND OPERATING INFORMATION FOUND ON THE MACHINE AND IN THE OPERATOR'S MANUAL BEFORE OPERATING THE UNIT.

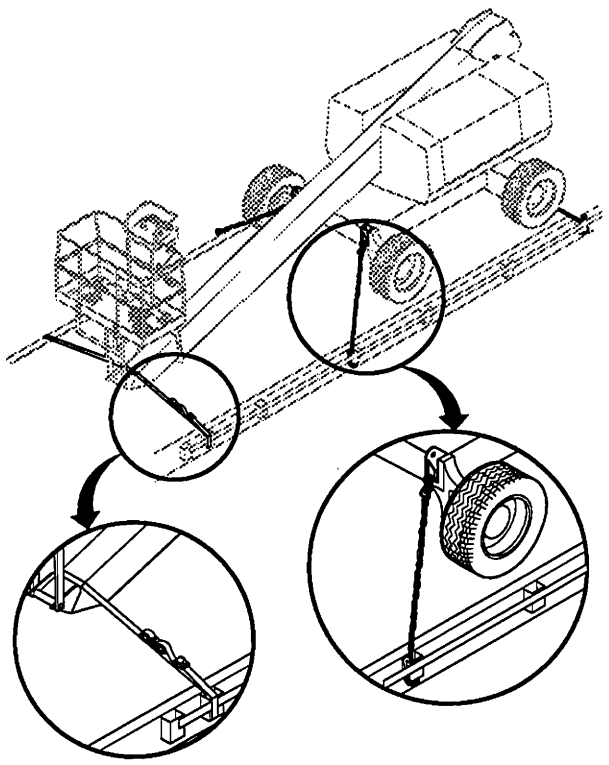
THE WINCH OPERATOR AND UNIT OPERATOR MUST COORDINATE MOVEMENT WHILE LOADING THE UNIT.

- Enter the platform, and start the engine using the platform controls. Select the "HI" engine speed, if so equipped.
- Raise the boom so that the platform will clear any obstacles as the machine is driven up the loading ramp. Boom must not be above horizontal on flat surface or extended. It may be necessary to swing the superstructure to the side to allow greater ground clearance.
- Carefully drive the unit onto the truck or trailer.
- Lock the superstructure to the undercarriage by installing the lock pin provided.
- Confirm that the boom is fully retracted, and that the platform will not contact any other item, including the bed of the truck or trailer.

⚠ CAUTION

The platform must not be tied down to the truck or trailer bed in any way.

- Secure the unit to the truck or trailer bed. Tie down lugs are located on all four corners of the undercarriage.
- The negative battery cable should be disconnected for long distance transport. It is also recommended that the fuel and hydraulic tank valves be closed.



Recommended Transport Tie Down.

UNLOADING PROCEDURES

- Inspect the outside of the unit for damage (including the underside). Inspect all hoses, boom sections and cables for chafing or shipping damage.
- Remove the pin that locks the superstructure to the undercarriage near the swing bearing. Stow the lock pin in the location provided.
- Unlock and open both side compartments. Inspect all fuel, electrical and hydraulic connections for damage and security.
- Connect battery cables to battery, if required.
- Open the fuel tank valve.
- Check engine oil level, and add as required per engine manufacturer's recommendations.
- Check fluid level at the sight gauge on the hydraulic tank, and add fluid as required (see Lubrication Chart). Check that shutoff valves on the hydraulic tank are open.
- Ensure side compartment covers are closed and attach a winch line to the unit to assist with unloading.

⚠WARNING

ALWAYS USE A WINCH TO ASSIST LOADING OR UNLOADING THE UNIT FROM A TRUCK OR TRAILER. WE DO NOT RECOMMEND UNASSISTED LOADING OR UNLOADING OF ANY MOBILE PLATFORM.

READ AND UNDERSTAND ALL SAFETY, CONTROL AND OPERATING INFORMATION FOUND ON THE MACHINE AND IN THE OPERATOR'S MANUAL BEFORE OPERATING THE UNIT.

- Perform Machine Startup procedures found in the Operator's Manual. Refer to Operator Controls Descriptions, as necessary. Turn off engine.
- Remove all machine tie downs. Remove wheel chocks, if used. Switch the Ground/ Platform toggle to "PLATFORM CONTROLS".
- Enter the platform, and restart the engine using the platform controls. Select the "HIGH" engine speed (if so equipped), and test all platform functions.
- Raise the boom so that the platform will clear any obstacles as the machine is driven down the loading ramp. Boom must not be above horizontal on flat surface or extended. It may be necessary to swing the superstructure to the side to allow greater ground clearance.
- Carefully drive the unit off the truck or trailer.

⚠ CAUTION

Winch line and unit travel must be coordinated during this procedure.

The brakes are automatically released for driving, and will automatically apply when the drive control lever is brought back to the neutral position.

- Before placing the unit into service, all operators must read and understand the contents of the Operator's Manual.

EMERGENCY SYSTEM AND PROCEDURES

⚠ DANGER

IF THE UNIT FAILS TO OPERATE WHEN THE PLATFORM IS RAISED OR EXTENDED, DO NOT ATTEMPT TO CLIMB DOWN THE BOOM ASSEMBLY. SERIOUS INJURY MAY RESULT.

EMERGENCY PUMP

The Trailblazer Mobile Platform has an emergency pump which can be operated from the operator's platform or ground control station to safely return the platform to the ground position when the unit has lost primary (engine/ pump) power.

- Press and hold the "EMERGENCY PUMP" button on the remote control pendant, **or**
- Press and hold the "EMERGENCY PUMP" button on the platform control console.

Select the proper function (boom retract, boom lower, or swing) as required to safely lower the platform to ground level.

To prevent the battery from completely discharging and the emergency pumps from overheating, release the emergency pump button to allow a 30 second rest period after every 30 seconds of operation. Once the unit has been safely positioned, correct the cause of the failure before returning the unit to service.

UNPOWERED EMERGENCY MOVEMENT

- Every attempt should be made to restore primary power to the unit before using this procedure.

⚠ DANGER

THIS PROCEDURE REQUIRES RELEASING THE VEHICLE BRAKES, WHICH RESULTS IN NO MEANS TO STOP THE UNIT'S TRAVEL. SIMON RECOMMENDS USING THIS PROCEDURE ONLY IN CASES OF EMERGENCY, AND FOR ONLY A SHORT DISTANCE.

BE AWARE OF THE POTENTIAL OF UNIT RUNAWAY ON SLOPING SURFACES. MOVEMENT SPEED SHALL NOT EXCEED 1 M.P.H. (1.6 K.P.H.).

- Secure the unit to a suitable tow vehicle with chains or ropes.

  The Trailblazer is equipped with tie down lugs that can be used for towing the unit. The chains or ropes must be of sufficient capacity to move the unit.

⚠WARNING

ALWAYS BLOCK THE WHEELS BEFORE YOU RELEASE THE BRAKES.

- Block wheels.
- Release brakes and recirculate fluid in drive circuit.

  1. Release motor from axle:

     a. Remove setscrew in lever.

     b. Push lever towards axle.

c. Replace setscrew in center hole in lever (lever is parallel to axle).

2. There is a hand pump located to the left of the ground control mounting bracket which can be used to release the brakes. Close the valve under the pump plunger by turning it to the right (clockwise) and operate hand pump. Continue to pump until high resistance is felt in the pump plunger. At this point, the unit will be in a free wheel condition.

3. After unblocking the wheels, the unit will be ready to be moved; however, there is no provision for steering the vehicle.

- After primary power has been restored to the vehicle, fully open the needle valve on the hand pump, and energize the drive motor to the axle by moving lever away from the axle.

  a. Remove setscrew in lever.

  b. Push lever away axle.

  c. Replace setscrew in notch in lever (lever is perpendicular to axle).

- The machine is now ready for normal operation.

EMERGENCY LOWERING

It is not possible for us to foresee every emergency situation that could arise during operation of this machine. Information on the following pages describes three emergency situations, and lists appropriate actions that can be taken.

When faced with an emergency, above all, please remember:

- Stay calm.
- Think through the situation before operating the machine.
- Get help if necessary.

SITUATION: Platform elevated, operator not incapacitated, but unit will not respond to platform controls.

POSSIBLE CONDITION:

- One or more functions not operating correctly.
- Unit movement from unselected control lever.
- Unit function will not stop unless power is switched off.

CORRECTIVE ACTION

1. Remove foot from foot pedal.
2. Push the red "Emergency Stop" Button.
3. Evaluate the nature of the failure. Return to the ground, using the emergency pump and lowering procedure (see "Emergency Pump").
4. If unable to return to the ground using the platform controls and the emergency pump, contact an experienced operator to lower the machine with the emergency pump using the ground controls (see "Emergency Pump").

⚠ DANGER

DO NOT TRY TO CLIMB DOWN THE BOOM.

HAVE AN EXPERIENCED OPERATOR USE THE EMERGENCY PUMP TO SAFELY LOWER THE PLATFORM.

5. **Report the incident to your supervisor immediately.**

SITUATION: Unit elevated, with operator incapacitated at platform controls.

⚠ DANGER

DO NOT TOUCH UNIT !!!

DETERMINE THE CAUSE OF THE PROBLEM BEFORE YOU TOUCH THE MACHINE.

CORRECTIVE ACTION

1. Check for contact with power lines.
2. Have someone summon first aid or rescue squad.
3. Attempt to talk to operator before taking any rescue measures.
4. **Check to see if the operator is in a pinned position, or would be endangered if platform is moved, before attempting emergency lowering procedure.**
5. After establishing that the machine is not in contact with live power lines, lower the platform using the emergency lowering procedure (see "Emergency Pump", earlier in this section).
6. Render first aid to the operator.
7. **Report the incident to your supervisor immediately.**

IMPORTANT: Any incident involving personal injury must be immediately reported to the local Simon Aerials Distributorship as well as to Simon Aerials Inc.

SITUATION: Platform in contact with live power lines and operator incapacitated.

⚠ DANGER

DO NOT TOUCH UNIT !!!!

ELECTROCUTION HAZARD!!!

CORRECTIVE ACTION

1. Contact authorized personnel to disconnect power supply touching unit.
2. Have someone summon first aid or rescue squad.
3. If operator is unconscious, check to see if he is in a pinned position, or would be endangered if platform is moved.
4. **AFTER POWER IS CUT,** use the emergency lowering procedure to bring platform with operator to a safe location to render first aid (see "Emergency Pump").
5. **Report the incident to your supervisor immediately.**

IMPORTANT: Any incident involving personal injury must be immediately reported to the local Simon Aerials Distributorship as well as to Simon Aerials Inc.

SECTION 2:
HYDRAULIC SYSTEM

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HYDRAULIC FLUID

HANDLING PRECAUTIONS

⚠WARNING

PERSONS IN REGULAR CONTACT WITH MINERAL-BASED HYDRAULIC FLUID NEED TO BE AWARE OF THE IMPORTANCE OF THOROUGH HYGIENE, AND THE PROPER METHODS FOR HANDLING MINERAL OILS IN ORDER TO AVOID POTENTIAL HAZARDS TO HEALTH.

If mineral-based hydraulic fluid is SPLASHED INTO THE EYES, it must be WASHED OUT THOROUGHLY using abundant quantities of water. If irritation persists, medical advice should be sought.

Mineral oils act as solvents on the natural oils in the skin. FREQUENT AND PROLONGED SKIN CONTACT CAN CAUSE DERMATITIS OR SEVERE IRRITATION. Mineral-based hydraulic fluids normally present no health hazard when used properly. Protective clothing and proper washing facilities should be provided or be accessible.

⚠WARNING

HYDRAULIC FLUID UNDER PRESSURE CAN PENETRATE AND BURN THE SKIN, DAMAGE EYES, AND MAY CAUSE SERIOUS INJURY, BLINDNESS, AND EVEN DEATH.

FLUID LEAKS UNDER PRESSURE MAY NOT ALWAYS BE VISIBLE.

IF MINERAL-BASED HYDRAULIC FLUID HAS PENETRATED THE SKIN, IT MUST BE MEDICALLY TREATED, WITHIN A FEW HOURS, BY A DOCTOR FAMILIAR WITH THIS TYPE OF INJURY.

FLUID RECOMMENDATIONS

We strongly recommend the use of MOBIL DTE-15 HYDRAULIC FLUID. An EQUIVALENT substitute can be used if absolutely necessary. Mineral-based hydraulic fluids produced by different companies will USUALLY mix with each other satisfactorily, but this IS NOT RECOMMENDED. When in doubt, consult your supplier.

MOBIL DTE-15 has proven to be suitable for use in all climates. For continued operation in temperatures below 32° F (0° C), use of MOBIL DTE-13 or DTE-11 FLUID is satisfactory. MOBIL DTE-16 is satisfactory in tropical climates.

HYDRAULIC FLUID ANALYSIS

Use the following as a guide to determine when analysis of the hydraulic fluid is necessary.

- Any time the hydraulic pump is replaced.
- If fluid discoloration is noticed in the hydraulic reservoir sight tube.
- If, after the first 50 hours of operation, the hydraulic filter elements are plugged.
- Any time the hydraulic filter elements show signs of metal contamination.
- If valve spools at either operator's station have continuous sticking problems which are not corrected by lubrication.
- Once every six months, under normal operating conditions.
- Every 3 months, in extremely dusty or dirty operating conditions.

The hydraulic fluid analysis must be done by a qualified laboratory. To ensure that you receive accurate recommendations about the fluid being analyzed, always provide the following information with the test sample.

- Type of hydraulic fluid (See Lubrication Chart).
- Model and serial number of unit from which sample was taken.
- Purpose of analysis: i.e. pump failure, discoloration, etc.
- Type of analysis: i.e. complete to show additive breakdown, acid buildup, viscosity, type and percent of contaminants; also, comparison to new fluid and recommendations.

Comply with contamination analysis and recommendations to achieve a clean, contamination free hydraulic system.

Following the above guide will prevent premature failure of pumps, cylinder seals and drive motors, and unnecessary down time.

If system flushing and replacement of fluid is recommended, refer to the flushing procedure.

SYSTEM FLUSHING PROCEDURE

⚠WARNING

BLOCK THE WHEELS OF THE MACHINE TO PREVENT UNEXPECTED MOVEMENT OF THE MACHINE.

1. With BOOM DOWN AND FULLY RETRACTED (in stowed position), drain hydraulic fluid from hydraulic tank into a clean, empty container. Use an oil filter cart so the fluid may be reused if analysis is good.
2. When the hydraulic tank is empty, remove suction hose to pump, emergency pump hose, telescope retract return hose, vent (return) hose for telescope cylinder, manifold return hose, drive hose from pump with the tee for motor drain.
3. Remove all hoses between pump and high pressure filter.
4. Flush the hoses.
5. Remove hydraulic fluid filter, and flush the filter body and attaching hoses. Discard old filter element and replace.
6. With hoses removed from the hydraulic tank, flush out the tank.
7. Reinstall all the hoses removed in the previous steps EXCEPT the return lines to tank. Temporarily tie hoses together and position these hoses so that they will drain into a clean container.
8. If the hydraulic fluid removed from the reservoir is good, pump it (through a filter cart) back into the tank. If fluid is not usable, dispose of it and fill the hydraulic tank with filtered, fresh hydraulic fluid (refer to Lubrication Chart).
9. Open the suction line valve to allow fluid to flow to the hydraulic pump.
10. Loosen hose fittings at pump to allow pump to flood with hydraulic fluid. Tighten pump fittings.
11. Turn main power key switch to the "Ground" position.
12. Press "Engine Start" button to start engine.
13. Activate pump selector toggle switch on remote control pendant and hold at "Main" to active engine powered pump.

⚠ CAUTION

Use care when operating functions as return hydraulic fluid is now being returned to container provided.

14. Cycle all cylinder functions to the end of their stroke to flush the hydraulic components of the hydraulic fluid. This will remove old fluid from the hydraulic system as the cylinder is cycled to its maximum limits.

⚠ CAUTION

Monitor the hydraulic reservoir fluid level when cycling the unit's functions. Add fluid as necessary to replace that being discharged to container through system return line. This fluid may be returned to the reservoir through a filter cart, if the fluid analysis shows that it is good.

Three cycles of ALL hydraulic cylinder functions should remove old hydraulic fluid.

15. Disconnect the return hoses for the drive motors. Tie the hoses together and let them drain into a clean container.

⚠ CAUTION

ALWAYS BLOCK THE WHEELS before you raise the machine.

16. Jack the front end of the unit so the front drive wheels are off the ground.

17. Activate pump selector toggle switch on remote control pendant and hold at "Main" to active engine powered pump.

18. Activate the drive switch on remote control pendant to flush the drive circuit hydraulic components of the hydraulic fluid.

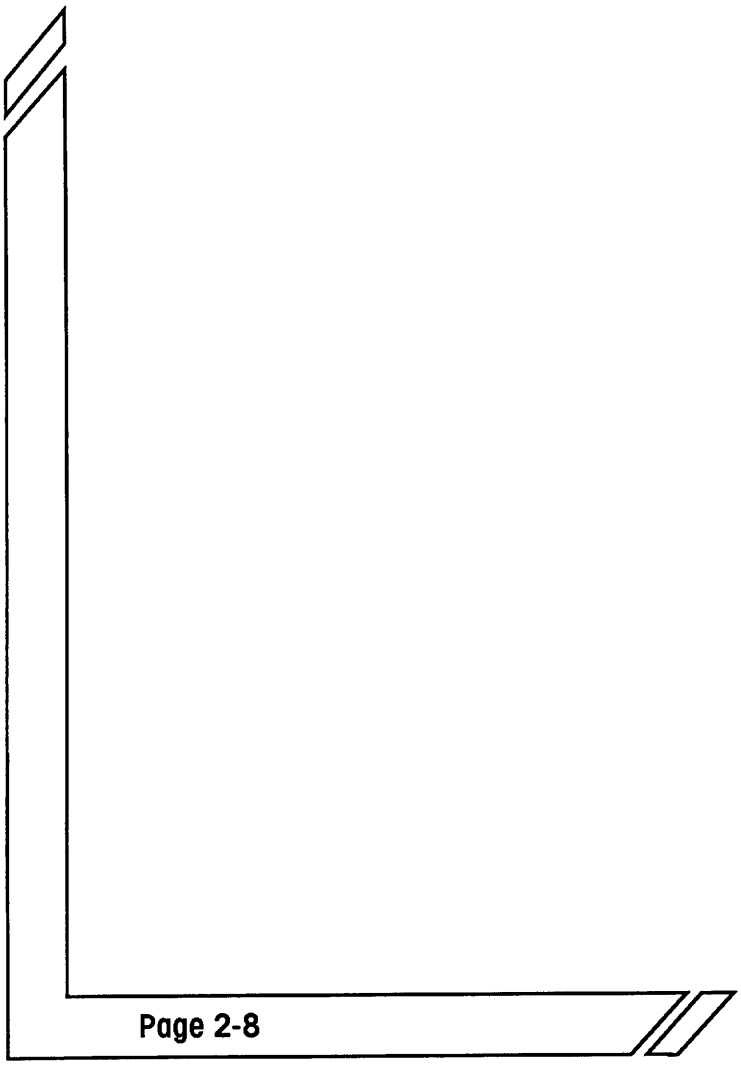
19. Activate the steer toggle switch on remote control pendant to flush the steer cylinder of the hydraulic fluid.

20. When the above procedures have been completed, re-connect all return hoses to tank and the return hoses for the drive motors.

21. Fill hydraulic tank to full mark on sight gauge.

22. Operate all functions to their full extreme positions to ensure proper operation.

23. Check for leaks and correct as necessary. Unit is now ready to be placed back in service.

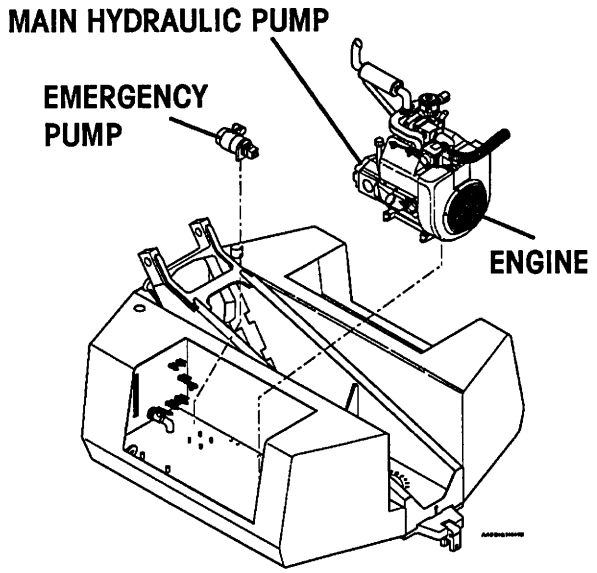


HYDRAULIC SYSTEM COMPONENTS

Following is a description of the major components of the Trailblazer hydraulic system.

HYDRAULIC PUMP

There are two pumps on the machine; the main hydraulic pump and the emergency pump.



Hydraulic Pumps Location.

MAIN HYDRAULIC PUMP

The main hydraulic pump is a variable displacement pressure compensated radial piston pump.

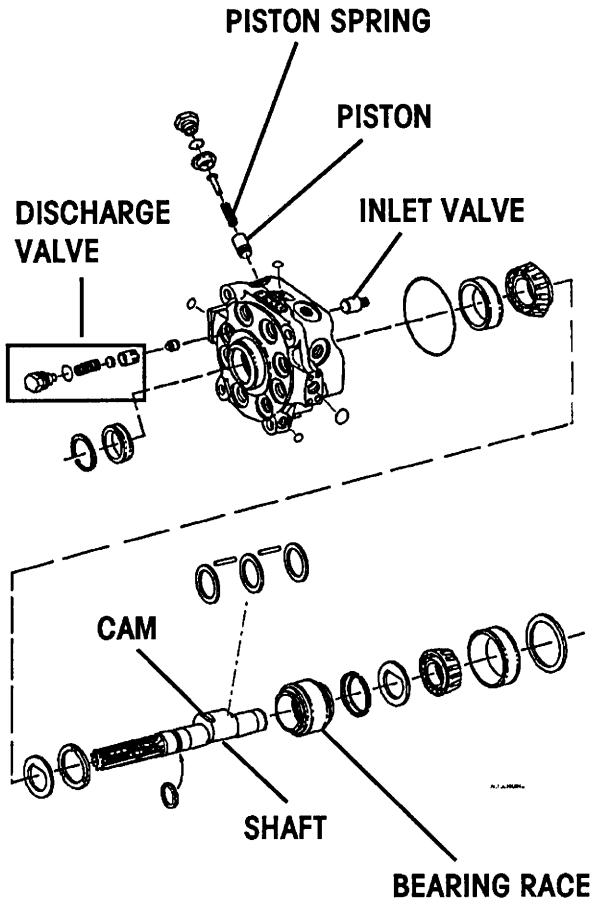
Hydraulic fluid enters through the inlet ports. A common inlet gallery provides fluid to all eight inlet valves in the housing. Pistons radially surround an eccentric cam. The cam moves a bearing race upon which the pistons ride. Behind each piston is a spring which holds the piston against the bearing race.

As the pump shaft rotates a low pressure cavity develops in the piston spring area during downward stroke of the piston. This low pressure allows the inlet valve to open filling the piston cavity with hydraulic fluid. The inlet valve closes at the end of the intake stroke of the piston.

High pressure is developed as the race pushes the piston outward. As pressure increases a discharge valve opens allowing the fluid to pass into the outlet gallery.

At the end of the stroke, the discharge valve closes. All discharge valves share a common outlet gallery in the pump housing.

An orifice is located between the crankcase and the inlet gallery. Any fluid leakage past the pistons is routed through the orifice to the inlet gallery. This flow allows for cooling and lubrication.



Main Hydraulic Pump.

Pressure compensated pumps are designed to provide "on demand" high pressure fluid regardless of flow requirements up to the maximum pump output. The pressure compensator valve regulates fluid pressure into the pump crankcase. Increased pressure in the crankcase overcomes the piston spring pressure and hold the pistons away from the race, thereby destroking the pump.

MAIN HYDRAULIC PUMP ADJUSTMENT

⚠WARNING

ESCAPING FLUID UNDER PRESSURE CAN PENETRATE THE SKIN CAUSING SERIOUS INJURY. RELIEVE PRESSURE BEFORE DISCONNECTING HYDRAULIC LINES. KEEP HANDS AND BODY AWAY FROM PINHOLES AND NOZZLES WHICH EJECT FLUIDS UNDER HIGH PRESSURE. USE A PIECE OF CARDBOARD OR PAPER TO SEARCH FOR LEAKS. DO NOT USE YOUR HAND.

IF MINERAL-BASED HYDRAULIC FLUID HAS PENETRATED THE SKIN, IT MUST BE MEDICALLY TREATED, WITHIN A FEW HOURS, BY A DOCTOR FAMILIAR WITH THIS TYPE OF INJURY.

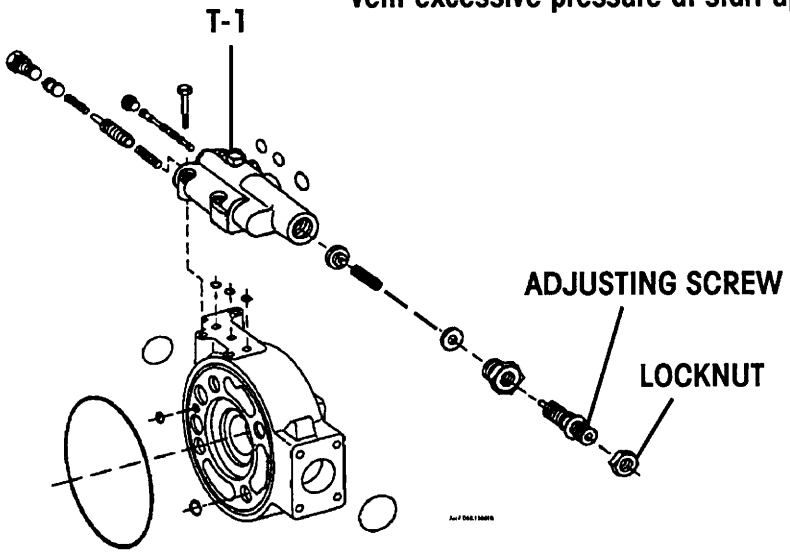
NOTE: Refer to "Machine Specifications" to determine maximum system pressure for your unit.

To adjust the system pressure:

- Install a 14 mm adapter to the high pressure test port (T-1) and connect a 5000 psi (345 Bar/ 352 Kg/cm²) gauge.
- Locate the adjusting screw on the side of the main pump adapter plate.
- Loosen the locknut and while viewing the pressure gauge, set system pressure to value specified in the "Machine Specifications".
    - Turn the adjusting screw out to decrease pressure, in to increase pressure.
- After system pressure has been set, tighten the lock nut.

⚠ CAUTION

When first starting a unit where the pump setting is unknown, the adjusting screw should be set to a minimum depth (nearly all the way out) to prevent excessive pressure at start up.

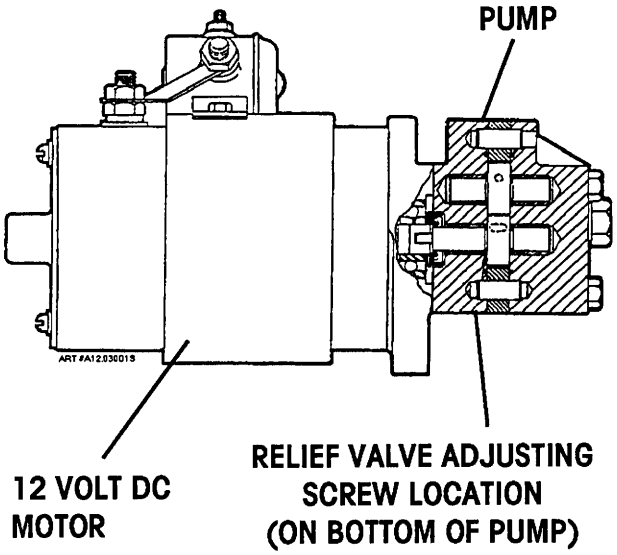


Main Hydraulic Pump Control Adjustment.

EMERGENCY PUMP

The emergency pump is driven by an electric 12 volt DC motor. This pump delivers hydraulic fluid, under pressure, to the manifold assembly. The electric motor is rated for non-continuous duty and will fail if activated continuously for extended time periods.

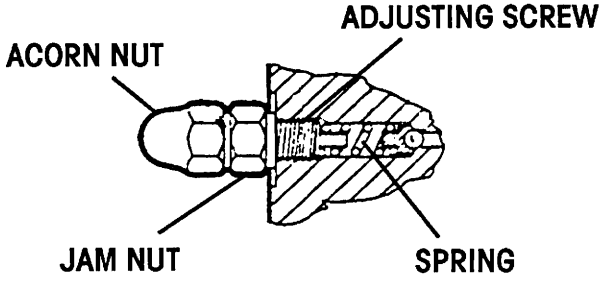
NOTE: This pump should only be used in emergency situations.



Emergency Pump.

EMERGENCY PUMP ADJUSTMENT

The emergency pump pressure setting screw is located on the side of the adapter plate. To adjust the relief pressure on the pump, remove the acorn nut, loosen the jam nut and turn the adjusting screw in to increase pressure. To decrease pressure, turn the adjusting screw out. (See "Machine Specification" for correct setting.)

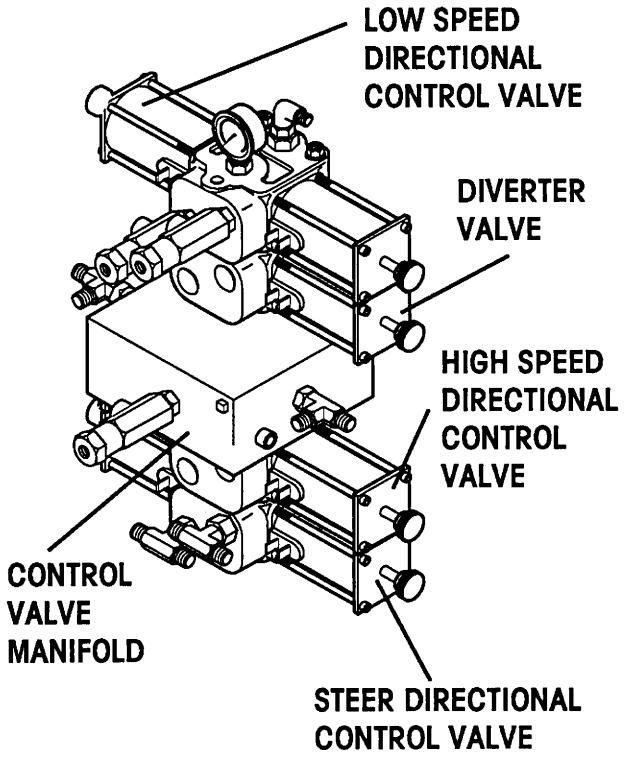


Emergency Pump Adjustment.

DRIVE/ STEER MANIFOLD ASSEMBLY

CONTROL VALVE MANIFOLD

The control valve manifold is located in the center of the drive/ steer manifold assembly (main valve stack). This control valve manifold allows hydraulic fluid, from either the main hydraulic pump or the emergency pump, to enter the directional control valves.



Manifold Assembly.

DIRECTIONAL CONTROL VALVES

The directional control valves send fluid pressure to the steer and drive functions; thereby, allowing steering, driving at high or low speed, or delivering fluid to either the gound or platform station. Three of these valves are 4-way, three position valves. The diverter valve is a 4-way, two position directional control valve. All directional control valves are solenoid operated with manual overrides. The manual override is disabled on the high speed drive valve.

MOTION CONTROL VALVE ASSEMBLY

MOTION CONTROL VALVE

This valve has a pilot operated counterbalance cartridge for forward and reverse hydraulic fluid flow. It also shuttles hydraulic fluid to the intregal brake assemblies, and produces a back pressure in the drive system so that no uncontrolled or "runaway" movement happens when the machine is driven on steep inclines.

FLOW CONTROL VALVE

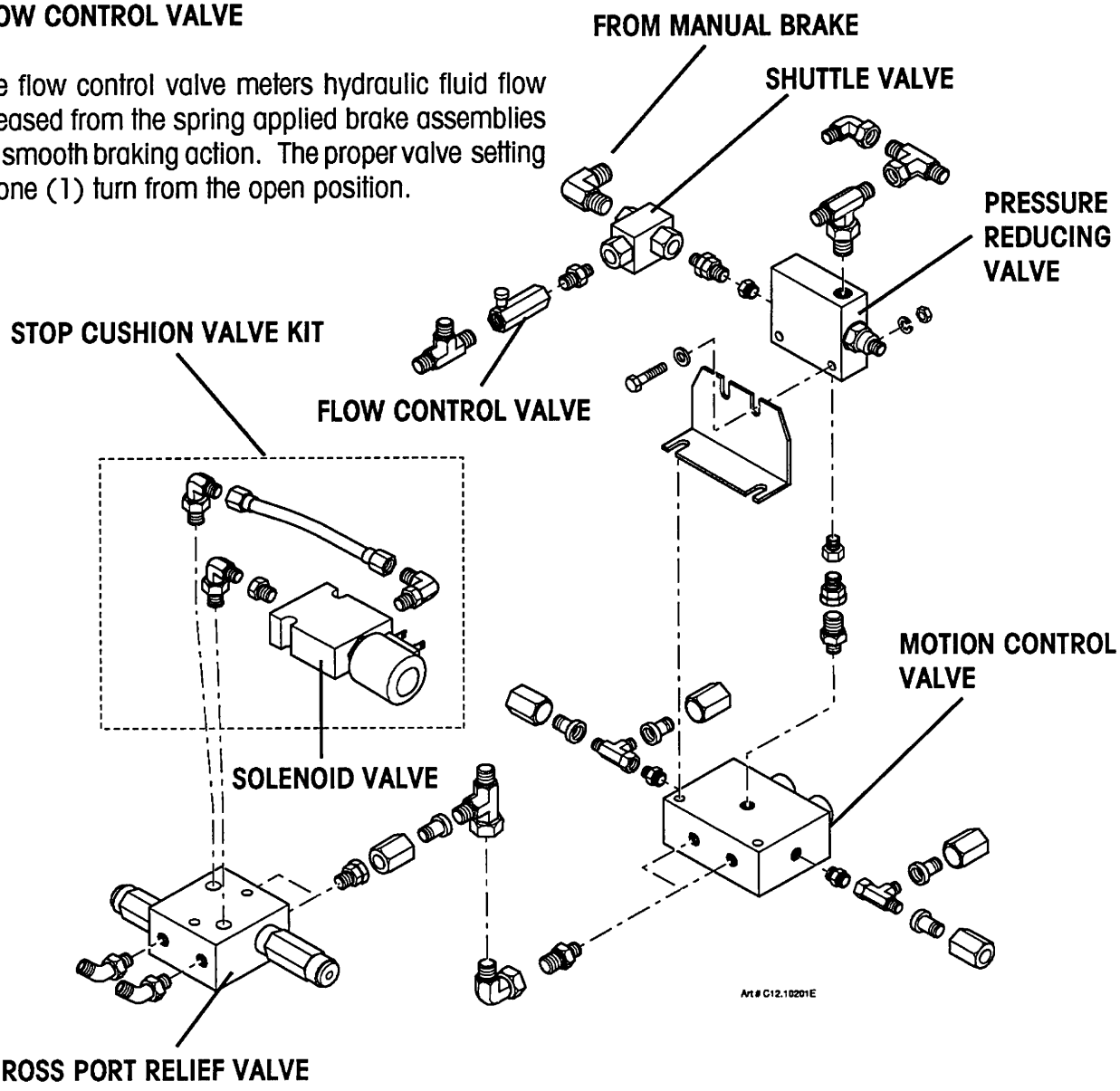
The flow control valve meters hydraulic fluid flow released from the spring applied brake assemblies for smooth braking action. The proper valve setting is one (1) turn from the open position.

SHUTTLE VALVE

The shuttle valve directs hydraulic fluid flow from either the drive pressure reducing valve or the manual brake release to the hydraulic release brake assembly.

PRESSURE REDUCING VALVE

Reduces pressure to a maximum of 435 psi (30 Bar/ 30.6 Kg/cm^2) for the brake assemblies.



Motion Control Valve Assembly.

CROSS PORT RELIEF MANIFOLD

The cross port relief manifold limits pressure to all wheel drive motors. Valves are set at 3000 psi (207 Bar/ 211 Kg/cm^2).

STOP CUSHION SOLENOID VALVE

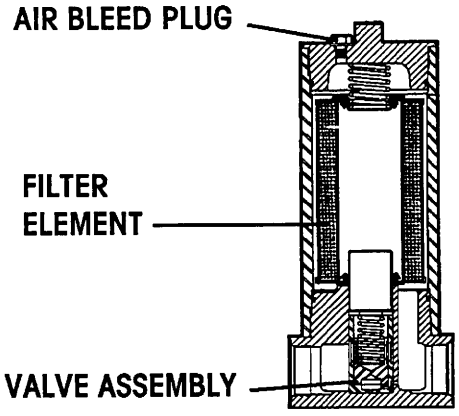
This solenoid valve controls the fluid flow across a small orifice to provide a gradual stop when the drive handle is centered to neutral. The valve is closed when in creep speed or on a slope to stop the machine instantly.

HIGH PRESSURE FILTER

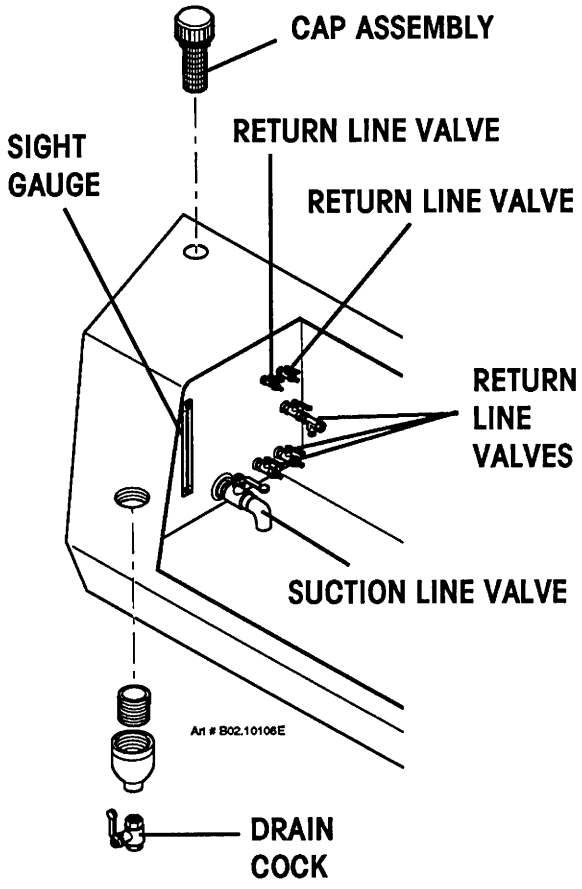
The high pressure hydraulic filter is a non-bypassing filter. This filter allows maximum fluid flow as long as the filter element is free of contaminants. When the filter is clogged, it restricts the hydraulic flow to avoid crushing the filter element due to differential pressure across the element. The build-up of pressure across the filter will affect high speed drive performance and act as an indication of a clogged filter.

HIGH PRESSURE FILTER ELEMENT

A 10 micron element is the standard element for this filter. However, an optional 3 micron element is available. See Lubrication Chart for frequency of changing the filter element.



High Pressure Filter.



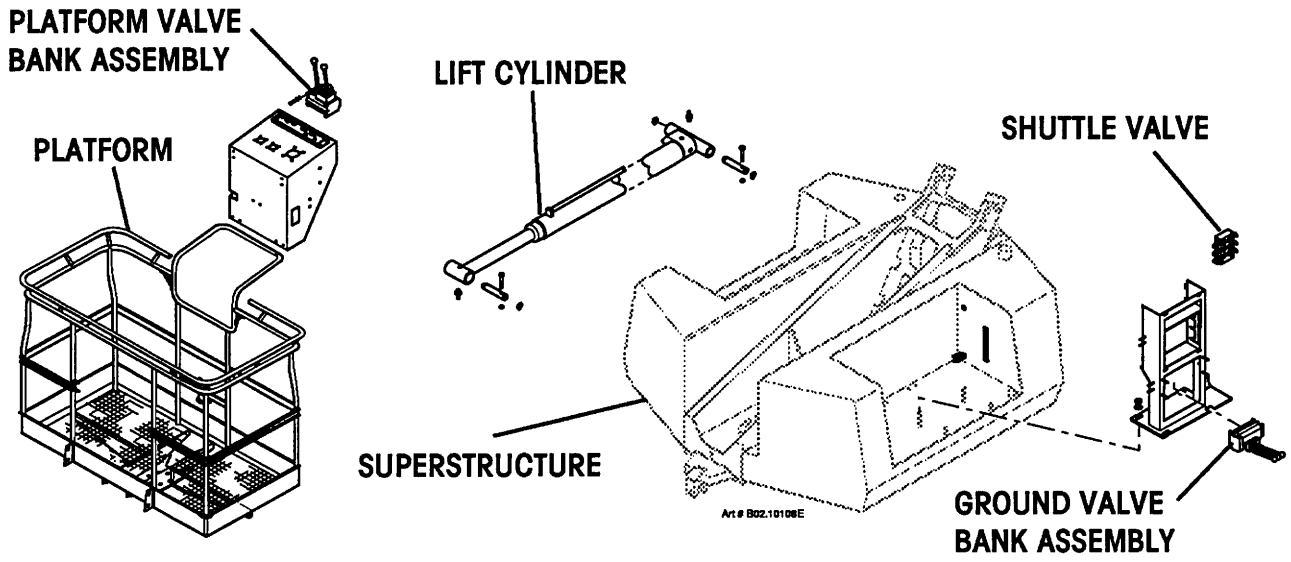
Hydraulic Fluid Reservoir.

HYDRAULIC FLUID RESERVOIR

The hydraulic fluid reservoir is a part of the superstucture weldment and consists of the tank, a cap assembly (breather and strainer), a drain plug, one valve for the suction line, five valves for return lines and a sight gauge.

HYDRAULIC RESERVOIR MAINTENANCE

Check tank for signs of leakage. Clean cap filter by flushing with clean solvent and drying. Condensation should be drained from the tank monthly through the "drain cock".



Boom Lift System Components.

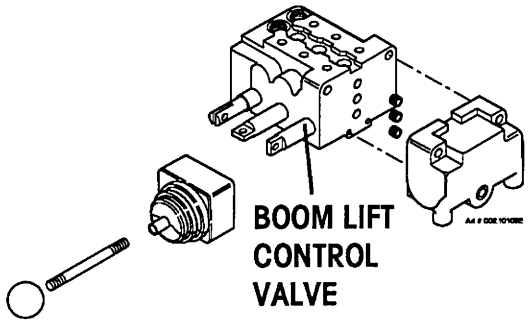
BOOM LIFT SYSTEM

The boom lift system consists of a hydraulic directional control valve in the platform valve bank assembly, another directional control valve in the ground valve bank assembly, a shuttle valve assembly and a lift cylinder with a counterbalance (holding) valve.

DIRECTIONAL CONTROL VALVES

Platform

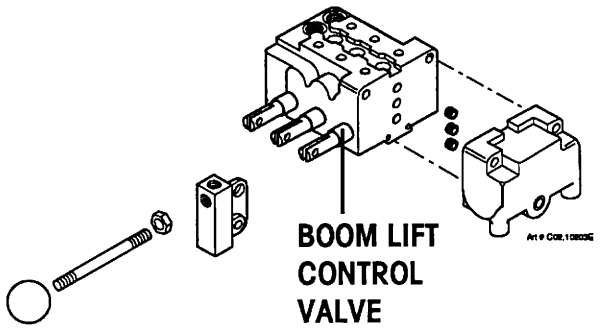
The platform directional control valve directs fluid flow to the boom lift cylinder thereby raising or lowering the boom. This valve is a 3 position, 4 way manually operated valve.



Platform Valve Bank Assembly.

Ground

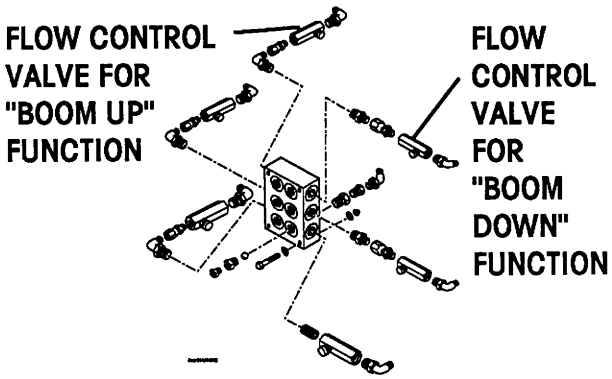
The ground directional control valve is located in the valve bank assembly with the telescope and swing functions. This valve directs fluid flow to the boom lift cylinder thereby raising or lowering the boom. This valve is a 3 position, 4 way manually operated valve.



Ground Valve Bank Assembly.

SHUTTLE VALVE ASSEMBLY

The shuttle valve assembly is located on the superstructure to the right of the ground controls. Two shuttle valves allow the return fluid from the boom lift cylinder to go directly back to the reservoir at the ground instead of traveling the longer route through the valve in the platform.



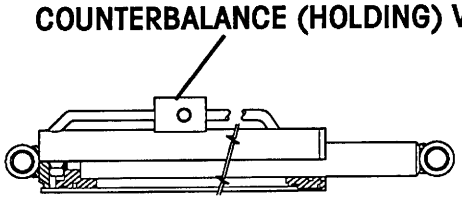
Shuttle Valve Assembly.

Flow Control Valve

The two top flow control valves limit the lift function speeds. Turn the needle valves counter-clockwise to increase fluid flow and clockwise to decrease fluid flow.

LIFT CYLINDER

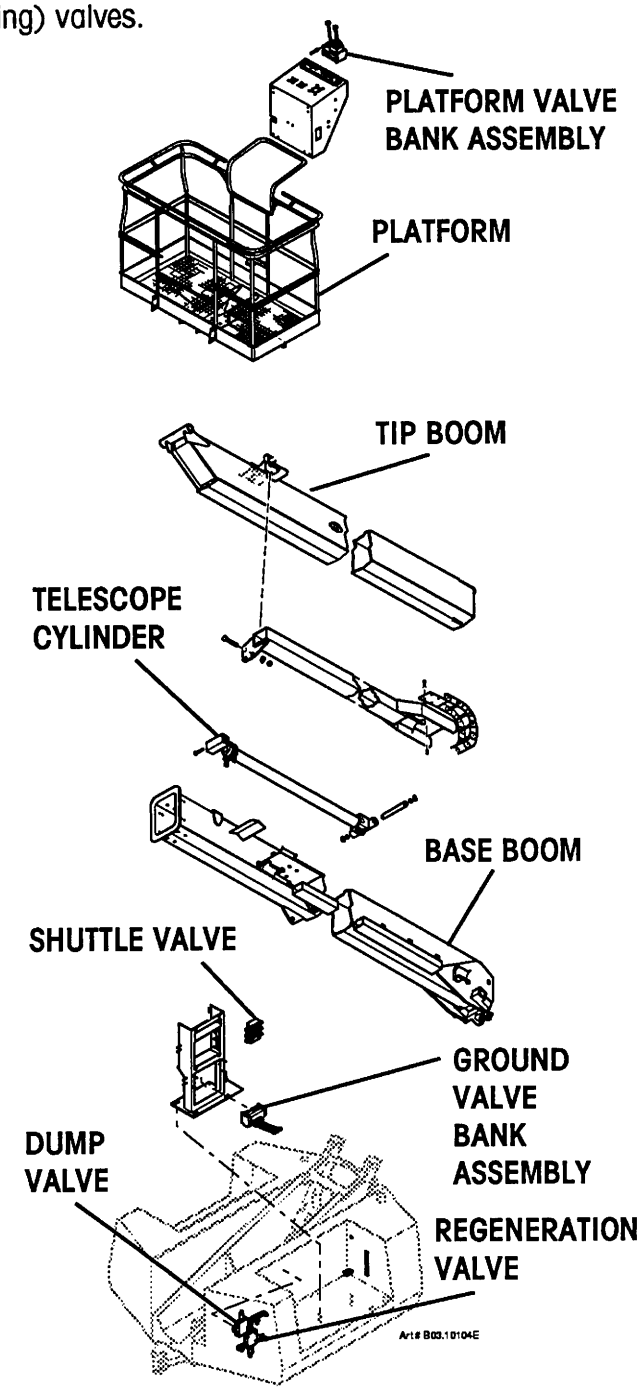
The boom lift function is performed by a double acting cylinder. This cylinder contains a counterbalance (holding) valve, which prevents unintended movement of the cylinder should a hose or fitting develop a leak. When the boom is lowered, fluid flows to the rod end cylinder port and to the counterbalance valve, opening this valve and allowing fluid from the base end of the cylinder to flow back to the reservoir.



Lift Cylinder.

BOOM TELESCOPE SYSTEM

The boom telescope system consists of a hydraulic directional control valve in the platform valve bank assembly, another directional control valve in the ground valve bank assembly, a shuttle valve assembly, a regeneration valve, a dump valve and a telescope cylinder with two counterbalance (holding) valves.

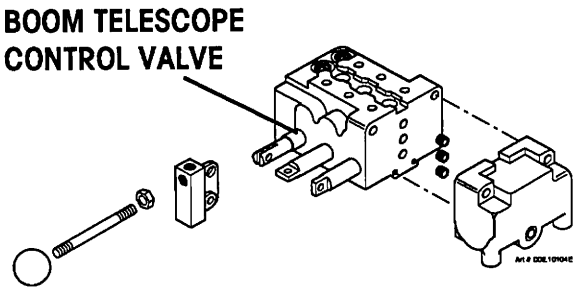


Boom Telescope System Components.

DIRECTIONAL CONTROL VALVES

Platform

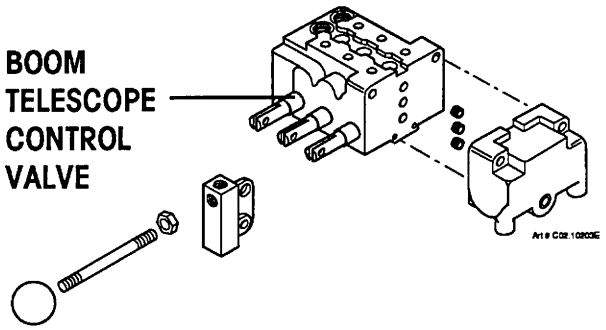
The platform directional control valve directs fluid flow to the telescope cylinder thereby extending or retracting the boom. This valve is a 3 position, 4 way manually operated valve.



Platform Directional Control Valve.

Ground

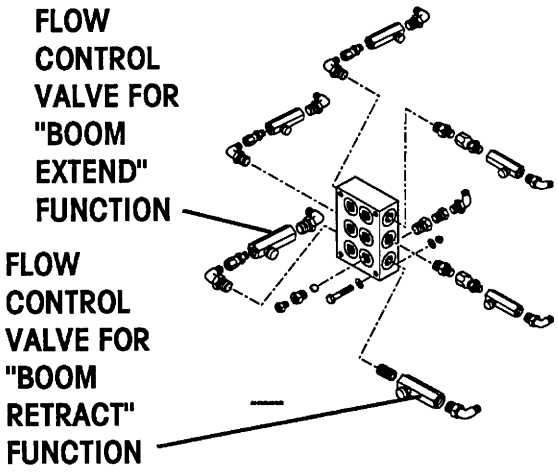
The ground directional control valve is located in the ground valve bank assembly with the lift and swing functions. This valve directs fluid flow to the telescope cylinder thereby extending or retracting the boom. This valve is a 3 position, 4 way manually operated valve.



Ground Valve Bank Assembly.

SHUTTLE VALVE ASSEMBLY

The shuttle valve assembly is located on the superstructure to the right of the ground controls. Two shuttle valves allow the return fluid from the boom telescope cylinder to go directly back to the reservoir at the ground instead of traveling the longer route through the valve in the platform.



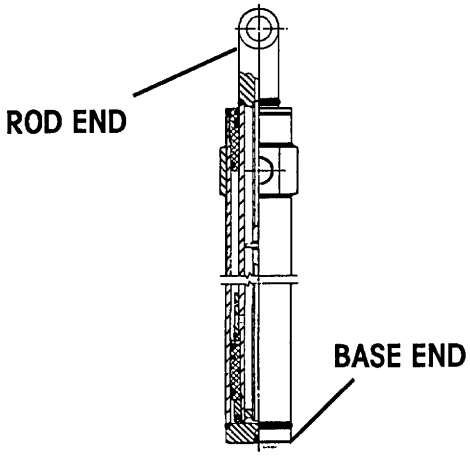
Shuttle Valve Assembly.

Flow Control Valve

The bottom two flow control valves limit the telescope function speeds. Turn the needle valves counter-clockwise to increase fluid flow and clockwise to decrease fluid flow.

TELESCOPE CYLINDER

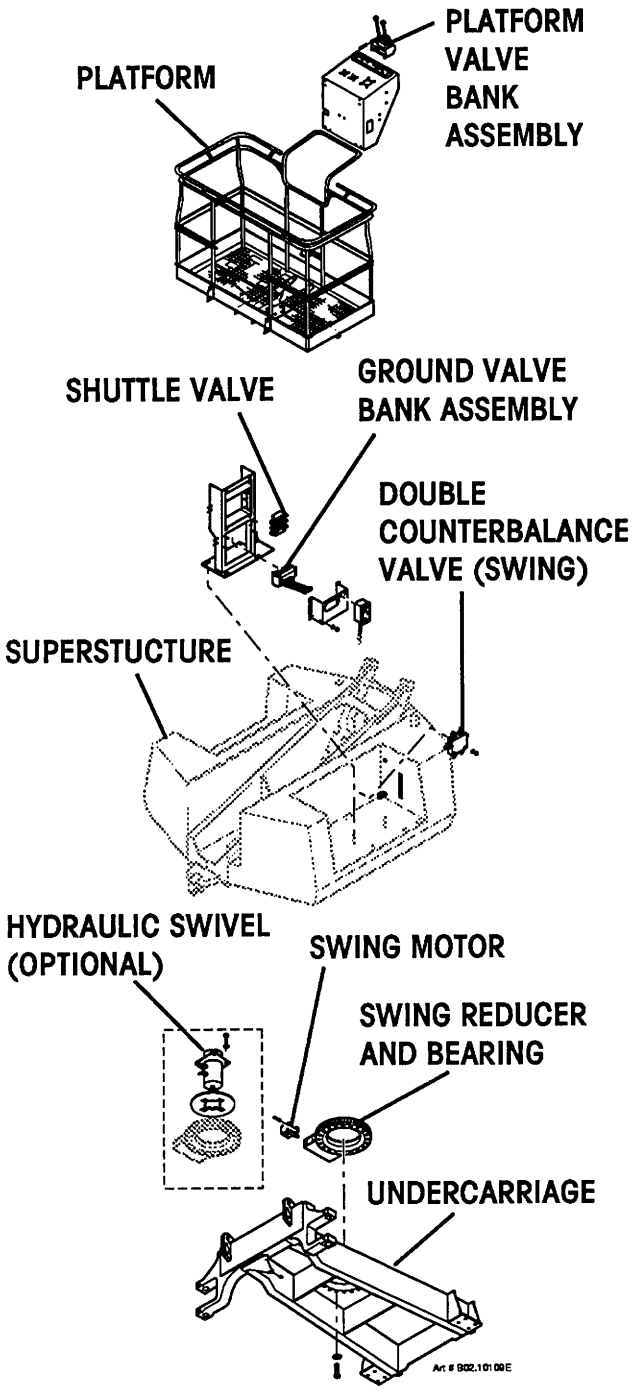
A double acting telescope cylinder performs the extension and retraction of the boom. This cylinder contains two counterbalance (holding) valves, which prevents unintended movement of the cylinder should a hose or fitting develop a leak. When the boom is extended, fluid flows to the base end cylinder port and to the counterbalance valve, opening this valve and allowing fluid from the rod end of the cylinder to flow back to the reservoir.



Telescope (Extend) Cylinder.

SUPERSTRUCTURE SWING SYSTEM

The superstructure swing system consists of a hydraulic directional control valve in the platform valve bank assembly, another directional control valve in the ground valve bank assembly, a shuttle valve assembly, a double counterbalance valve and a motor driven swing/ reducer and bearing.

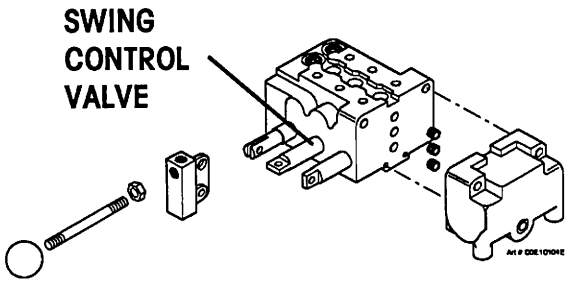


Superstructure Swing System Components.

DIRECTIONAL CONTROL VALVE

Platform

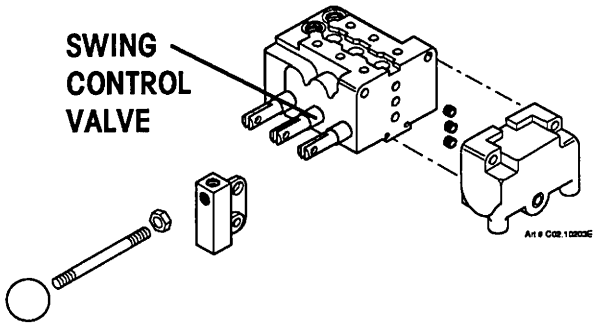
The platform directional control valve directs fluid flow to the swing motor to provide clockwise or counter-clockwise superstructure rotation. This valve is a 3 position, 4 way manually operated valve.



Platform Directional Control Valve.

Ground

The ground directional control valve is located in the valve bank assembly with the telescope and lift functions. This valve directs fluid flow to the swing motor to provide clockwise or counter-clockwise superstructure rotation. This valve is a 3 position, 4 way manually operated valve.



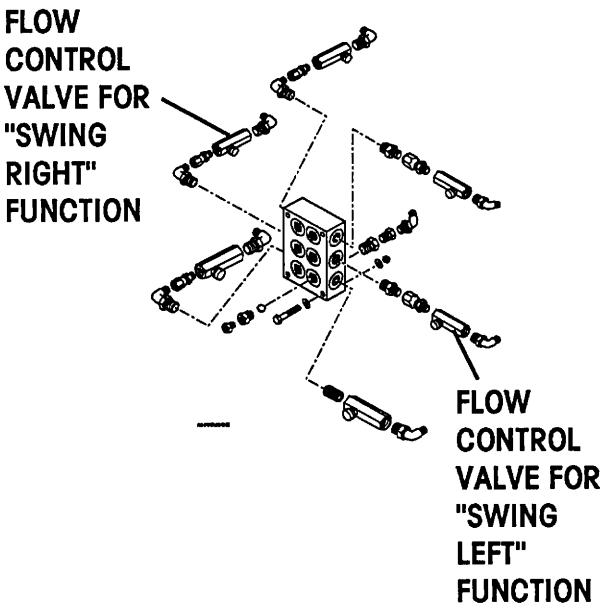
Ground Valve Bank Assembly.

SHUTTLE VALVE ASSEMBLY

The shuttle valve assembly is located on the superstructure to the right of the ground controls. Two shuttle valves allow the return fluid from the swing motor to go directly back to the reservoir at the ground instead of traveling the longer route through the valve in the platform.

Flow Control Valve

The middle two flow control valves limit the swing function speeds. Turn the needle valves counterclockwise to increase fluid flow and clockwise to decrease fluid flow.



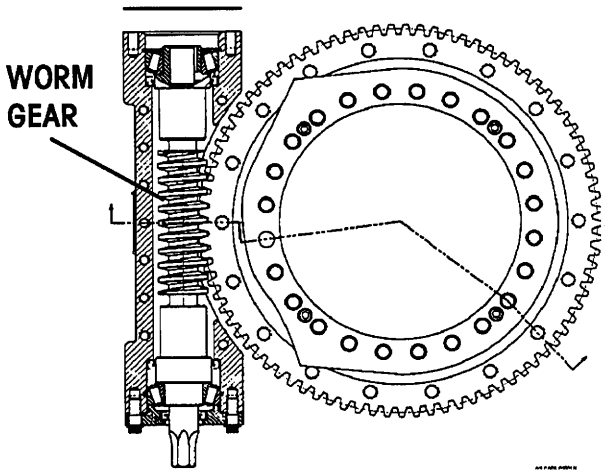
Shuttle Valve Assembly.

DOUBLE COUNTERBALANCE VALVE (SWING)

The double counterbalance valve acts a hydraulic lock for the swing motor. The valve maintains resistance to flow in one direction but permits free flow in the other direction.

SWING DRIVE MOTOR/ REDUCER ASSEMBLY

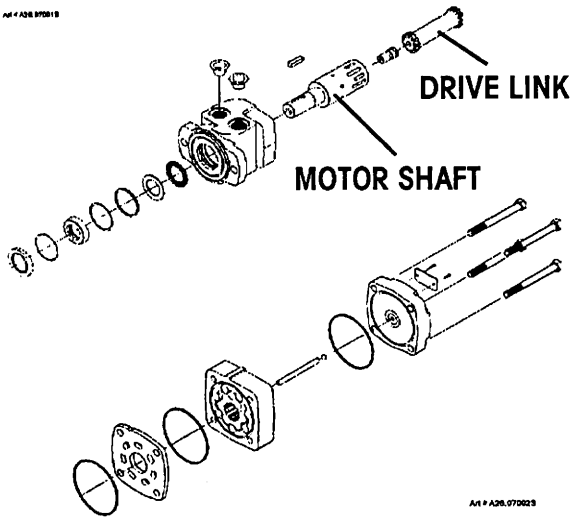
The worm gear swing reducer used on the Trailblazer allows the motor output to be reduced to a fractional speed and greatly reduces swing drive



Worm Gear Swing Reducer.

torque. This allows the superstructure to rotate at a slow controlled speed when fluid power is applied to the swing drive motor.

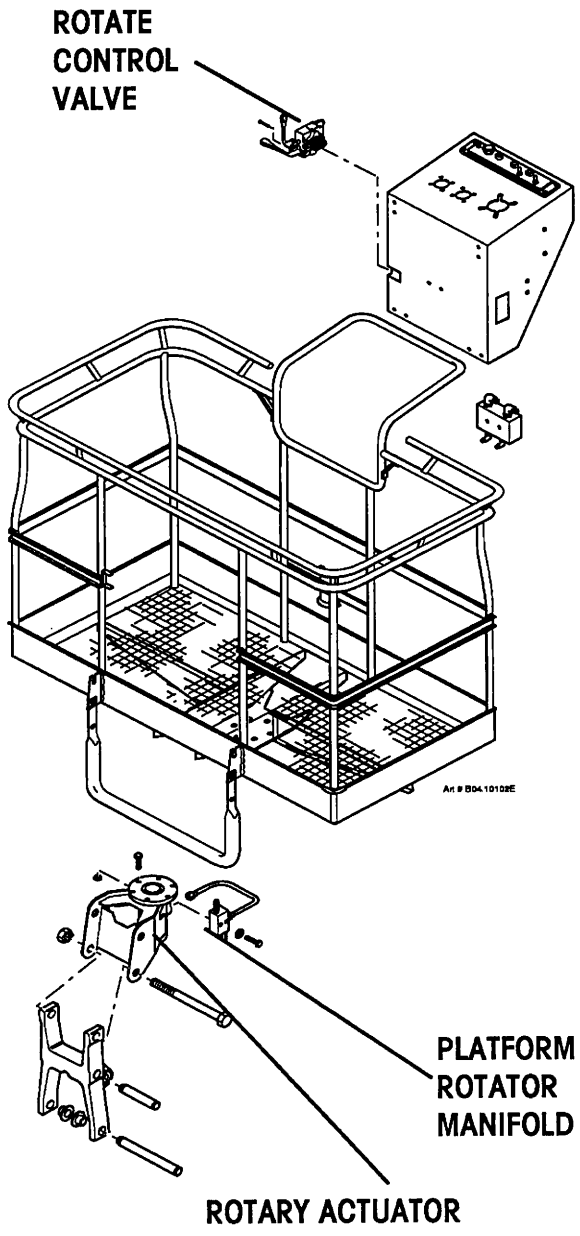
The swing reducer has an automatic built in lock to prevent superstructure rotation when the swing function is not being requested.



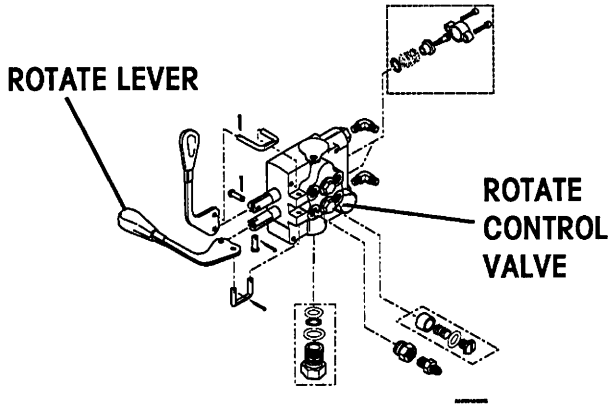
Swing Motor.

PLATFORM ROTATE SYSTEM

The platform rotate system consists of a platform rotate control valve, a rotary actuator and a platform rotator manifold. The platform rotate system can only be operated from the platform control console.



Components of Platform Rotate System.



Rotate Control Valve.

ROTATE CONTROL VALVE

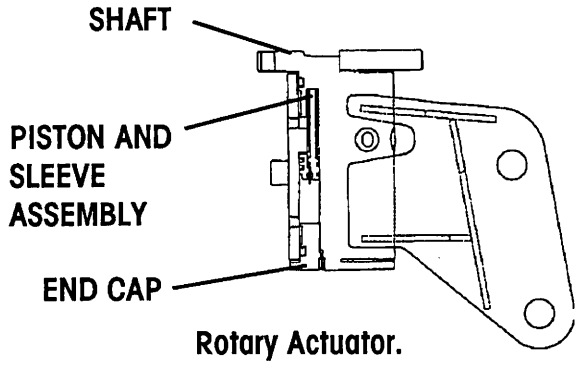
The platform rotate control valve is combined with the platform level control valve and is mounted on the left side of the control console. This valve is a three position, four way valve which is manually operated. This control valve directs fluid flow to the rotate function.

ROTARY ACTUATOR

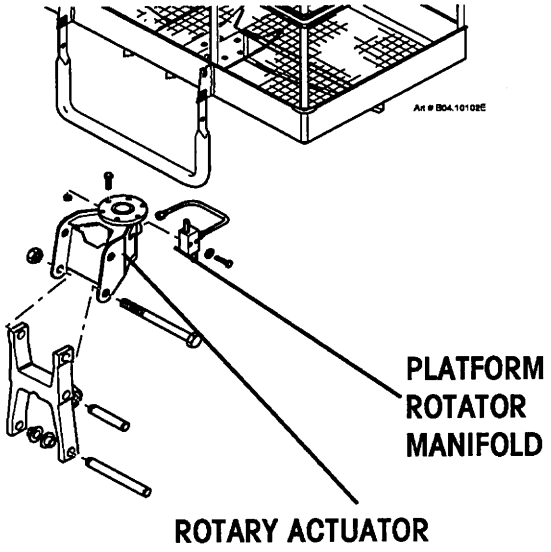
The rotary actuator is a piston type. Hydraulic fluid enters the actuator from one of two ports depending on direction of rotation. Fluid under pressure will bear on the piston and force piston sleeve up or down depending on rotation direction. The piston sleeve engages with the shaft and causes rotation of the platform.

Rotary Actuator Maintenance

Check end cap torque every 800 hours or once a year.



Rotary Actuator.



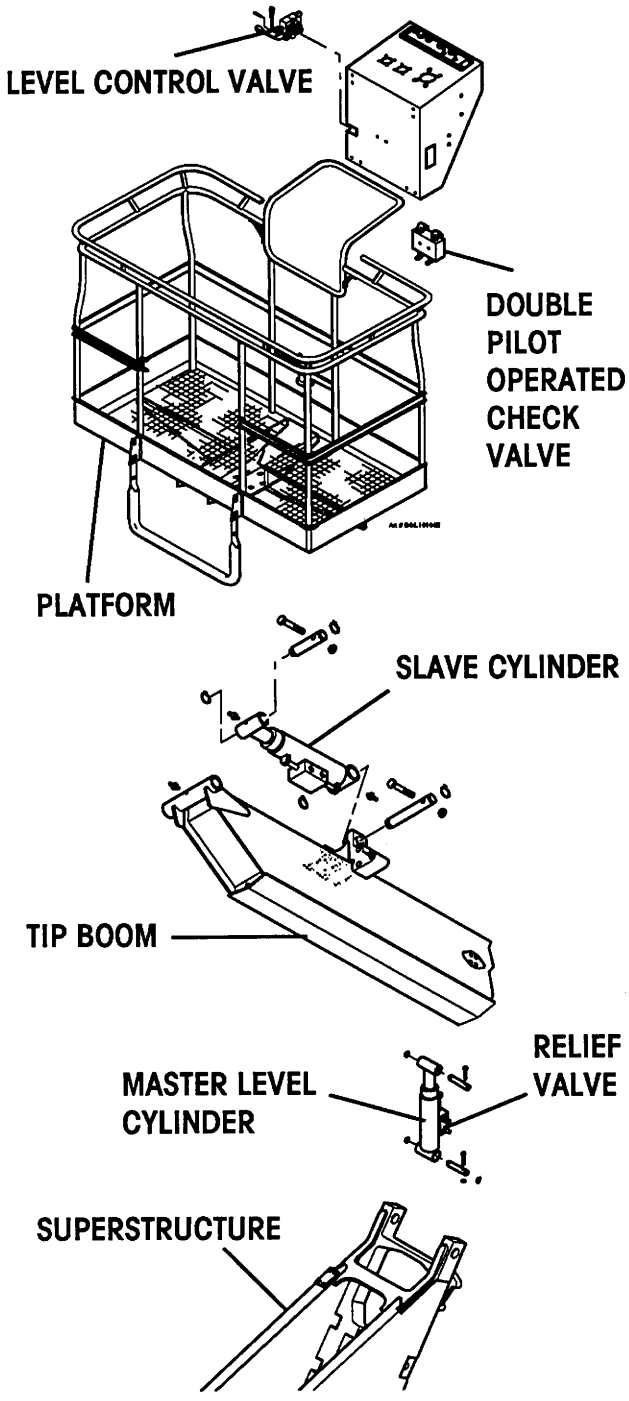
Components of Platform Rotate System.

PLATFORM ROTATOR MANIFOLD

The platform rotator manifold is mounted as an integral part of the rotary actuator. The platform rotator manifold acts as a cross port relief valve to prevent damage to the rotary actuator.

PLATFORM LEVELING SYSTEM

The platform level system consists of a level control valve, master leveling cylinder, slave leveling cylinder with counterbalance (holding) valve, double pilot operated check valve and two relief valves.



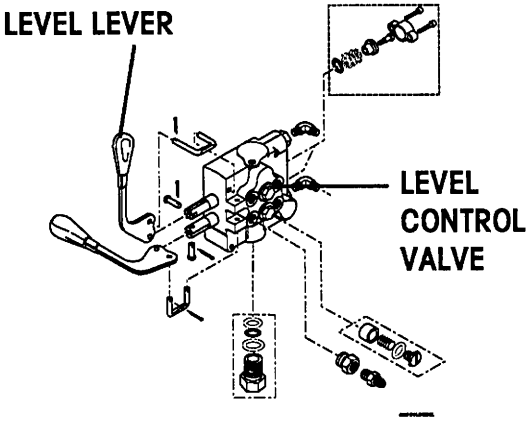
Platform LevelSystem Components.

The platform leveling system automatically keeps the platform level, using a master/ slave cylinder arrangement. As the boom is raised or lowered, fluid is forced from the master cylinder to the slave cylinder in a closed loop, which keeps the platform parallel to the ground in any boom position. Due to slight internal leakage, fluid may at times need to be added to the leveling circuit through the platform level control valve.

The platform level system is manually controlled only from the platform.

LEVEL CONTROL VALVE

The platform level control valve is combined with the platform rotate control valve and is mounted on the left side of the control console. This valve is a manually operated three position, four way valve. This control valve directs fluid flow to the level circuit in order to adjust the platform angle.



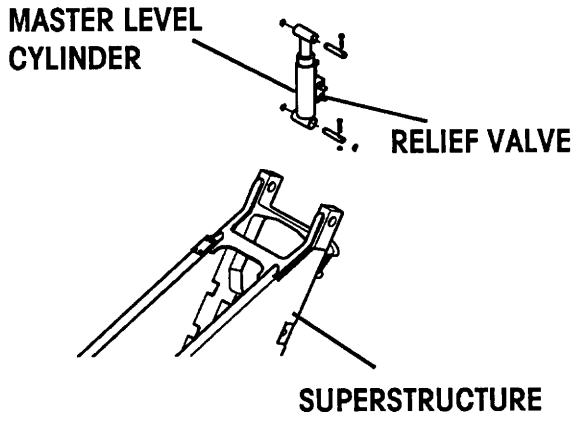
Level Control Valve.

DOUBLE PILOT OPERATED CHECK VALVE

The double pilot operated check valve acts to isolate the manual control valve from the closed loop leveling circuit. It prevents oil in the closed loop from escaping through the manual valve during leveling.

MASTER LEVEL CYLINDER

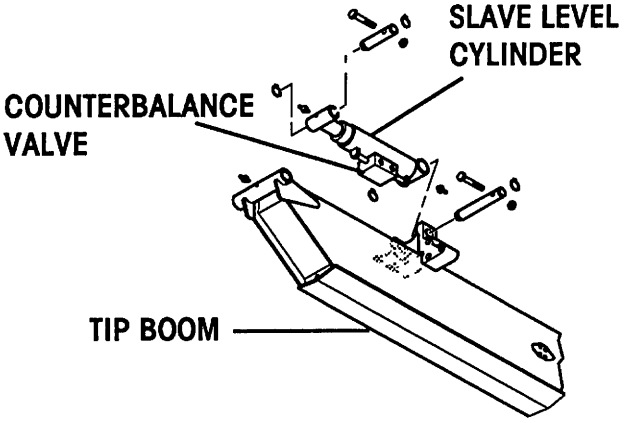
The master leveling cylinder is a double acting cylinder located between the superstructure and the base boom. Whenever the boom is raised or lowered, the master cylinder rod is forced to extend or retract. The fluid displaced from the master level cylinder is in turn sent up the boom to the slave level cylinder. This forces the slave level cylinder to move the same distance as the master level cylinder, tilting the platform to compensate for the change in boom angle.



Master Leveling Cylinder and Relief Valve.

RELIEF VALVES

The relief valves are factory set at 3000 PSI (207 Bar/ 211 Kg/cm^2) and prevent high pressure in the leveling circuit that could result in component damage. High pressure can occur if the platform has been manually levelled, which could cause the slave level cylinder to "bottom out" before the master level cylinder reaches the end of its stroke (either extending or retracting).



Slave Level Cylinder.

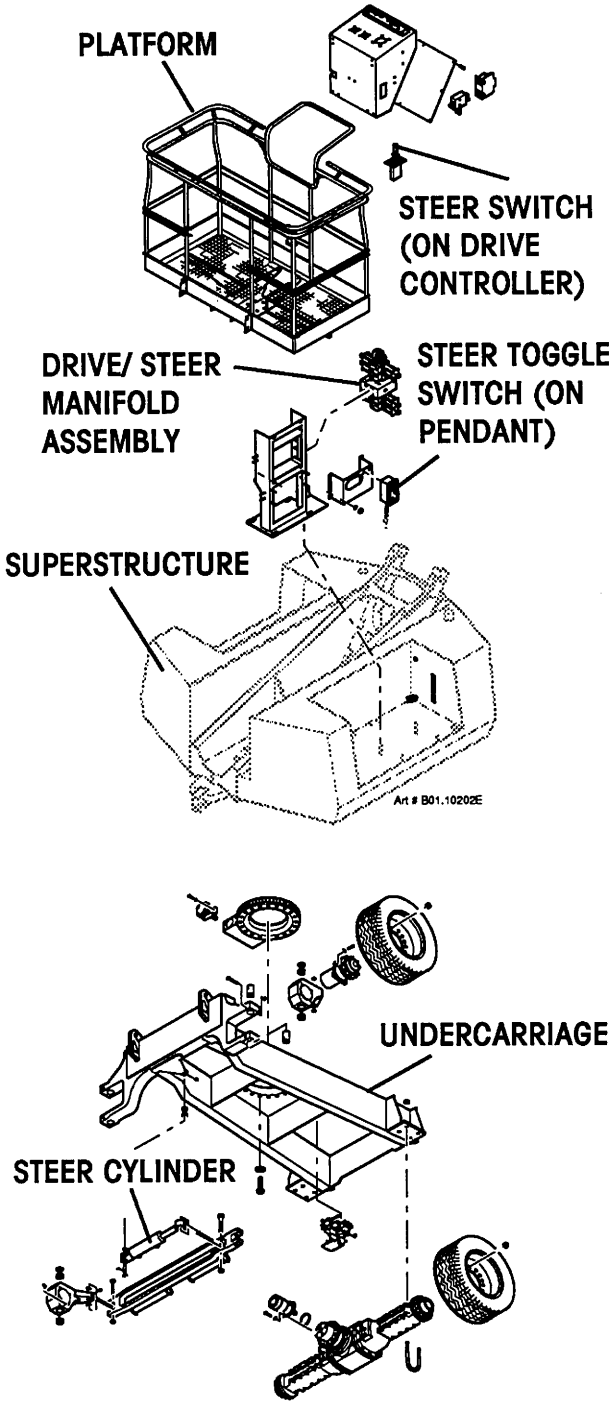
SLAVE LEVEL CYLINDER

The slave leveling cylinder is a double acting cylinder connected between the tip boom and the platform. This cylinder controls the angle of the platform relative to the tip boom.

The slave leveling cylinder contains two counterbalance valves. The counterbalance valves prevent platform movement in the event of hose failure.

STEER SYSTEM

The steer system consists of the steer cylinder, a valve on the drive/ steer manifold assembly, and control switches at both platform and ground.



Steer System Components.

DRIVE/ STEER MANIFOLD ASSEMBLY

The steer system is controlled by the bottom valve on the drive/ steer manifold assembly. This valve is activated from the platform by a thumb button on top of the drive control lever. When the thumb button is pressed to steer "LEFT" or "RIGHT", the steer valve spool, shifts to allow fluid flow to either the rod end or the base end of the steer cylinder.

The steer valve is activated from the ground by a toggle switch on the pendant control on the superstructure. When the toggle switch is moved to steer "LEFT" or "RIGHT", the valve spool, shifts to allow fluid flow to either the rod end or the base end of the steer cylinder.

STEER CYLINDER

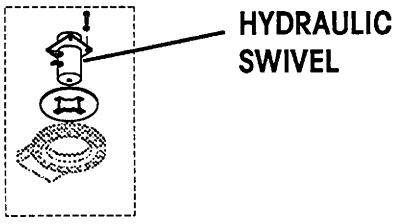
The steering system is actuated by a double acting hydraulic steer cylinder. The base end of the steer cylinder is attached to the undercarriage, while the rod end is connected to the steering linkage.

STEER SYSTEM MAINTENANCE

Check all pins on steering cylinder and linkage for excessive play, and ensure that all clips are in place and secure. Lubricate linkage as necessary. Check cylinder and hoses for hydraulic fluid leakage and security.

HYDRAULIC SWIVEL (OPTIONAL)

The optional hydraulic swivel allows passage of hydraulic fluid between the superstruture and the undercarriage. The swivel allows for 360° of continuous superstructure rotation in either direction.



Hydraulic Swivel Option.

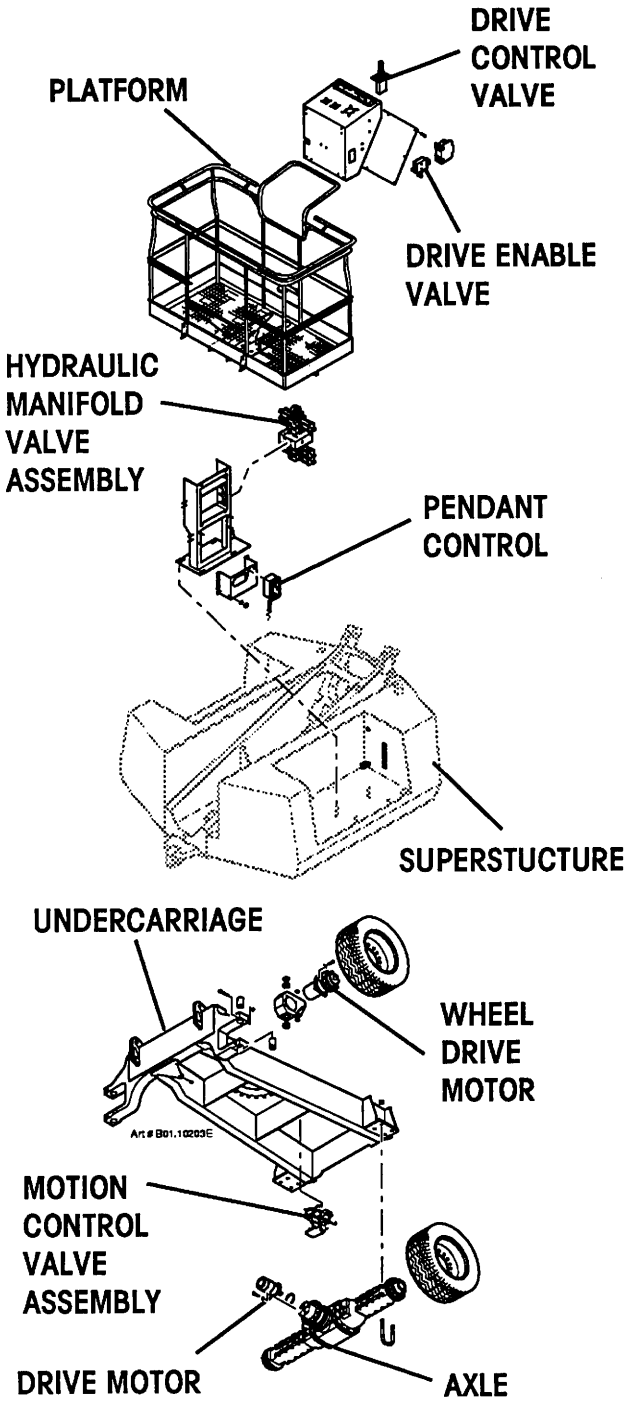
SECTION 3:
DRIVE SYSTEM

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DRIVE SYSTEM COMPONENTS

The Trailblazer drive circuit consists of a wheel drive motor at each front wheel and a hydraulic drive motor on the rear axle, a motion control valve assembly, a hydraulic manifold valve assembly, a pendant control, a drive enable valve and a platform drive control valve.



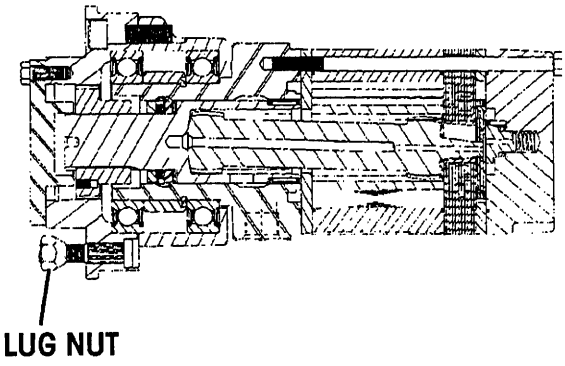
Drive System Components.

DRIVE MOTORS

There are two types of drive motors; one type of drive motor is mounted to each front wheel and a different type is mounted to the rear axle.

FRONT WHEEL MOTOR

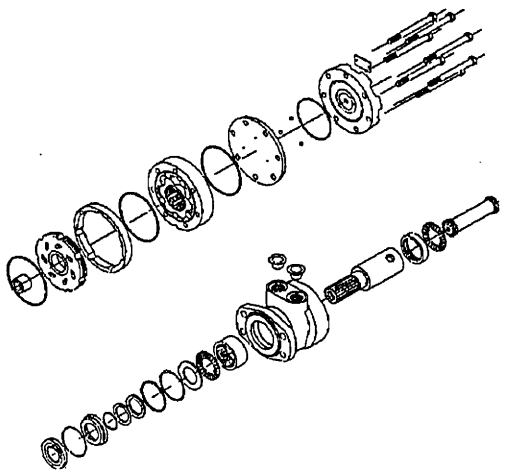
Two hydraulic motors drive the front wheels. If a motor is damaged, replace the motor. See "Mechanical Components" section in this manual.



Front Wheel Drive Motor.

HYDRAULIC DRIVE MOTOR

A third hydraulic motor is mounted on the rear axle assembly and drives the rear wheels. If motor is damaged, replace the motor. See "Mechanical Components" section in this manual.



Rear Hydraulic Drive Motor.

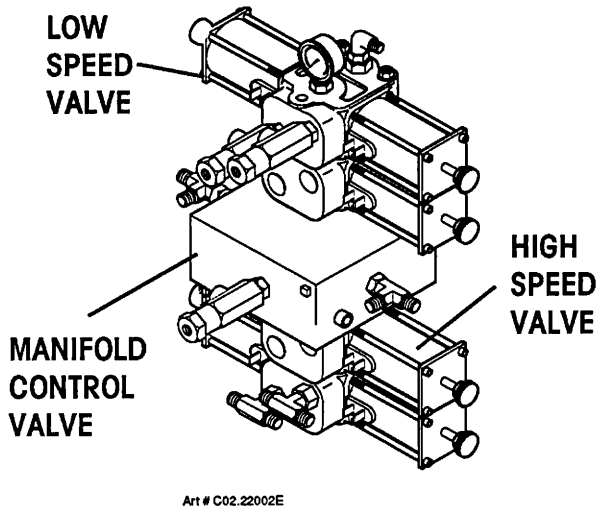
REAR AXLE ASSEMBLY

The rear axle assembly includes a spring applied/ hydraulically released brake. Check the oil monthly and change the oil yearly. For brake adjustment see "Mechanical Components" section in this manual.

HYDRAULIC MANIFOLD VALVE ASSEMBLY

The drive system is controlled by valves on the hydraulic manifold valve assembly. These valves are activated by the drive control lever on the platform control console or a toggle switch on the pendant control at the ground controls. When the drive control lever or the toggle switch is pushed to "FORWARD" or "REVERSE", the valve spools shift to allow hydraulic fluid flow to the drive motors.

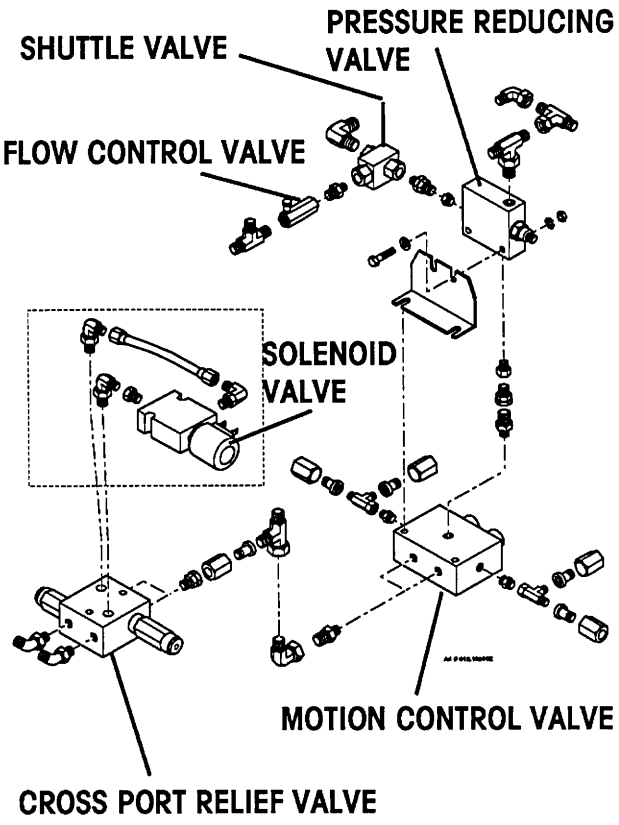
The low speed valve and the high speed valve are both 4-way, three position solenoid operated valves.



Manifold Assembly, Directional Control Valve.

MOTION CONTROL VALVE ASSEMBLY

The motion control valve assembly is mounted on the underside of the undercarriage, near the rear axle. It consists of the motion control valve, a flow control valve, a shuttle valve, a pressure reducing valve, a cross port relief manifold and a solenoid valve.



Motion Control Valve Assembly.

MOTION CONTROL VALVE

This valve has a forward and a reverse cartridge, that produces a back pressure in the drive system so that no uncontrolled movement occurs. This valve is factory preset and cannot be adjusted. It also has a small shuttle valve to direct fluid to the brake circuitry.

FLOW CONTROL VALVE

The flow control valve meters the hydraulic fluid flow released from the spring applied brake assemblies for a smooth braking action. The correct valve setting is one (1) turn from the open position.

SHUTTLE VALVE

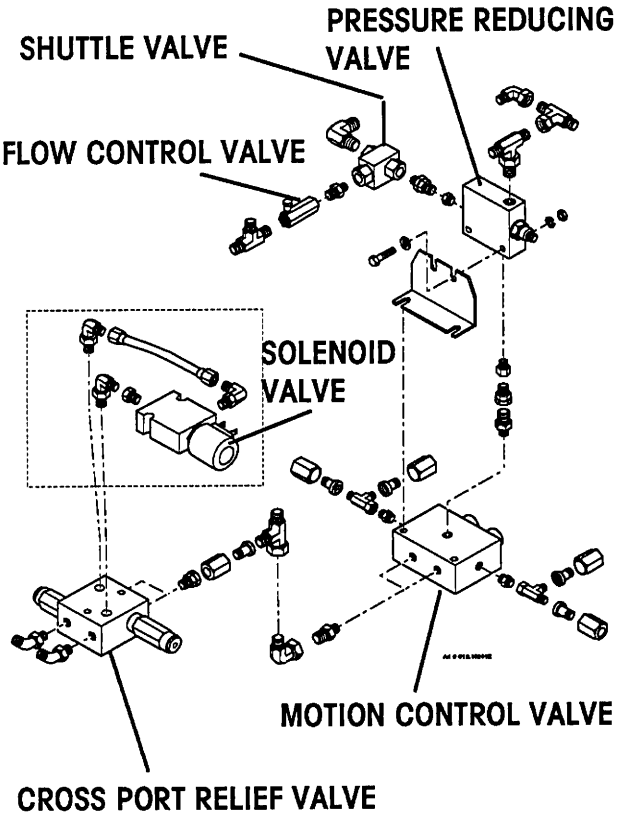
The shuttle valve directs hydraulic fluid flow from either the drive circuit or the manual brake release to the brake pressure ports.

PRESSURE REDUCING VALVE

Reduces pressure from a maximum drive pressure of 3000 psi (207 Bar/ 211 Kg/cm²) to 435 psi (30 Bar/ 30.6 Kg/cm²) for the brake assemblies.

CROSS PORT RELIEF MANIFOLD

The cross port relief manifold relieves pressure to the wheel drive motors. Valves are set at 3000 psi (207 Bar/ 211 Kg/cm²).



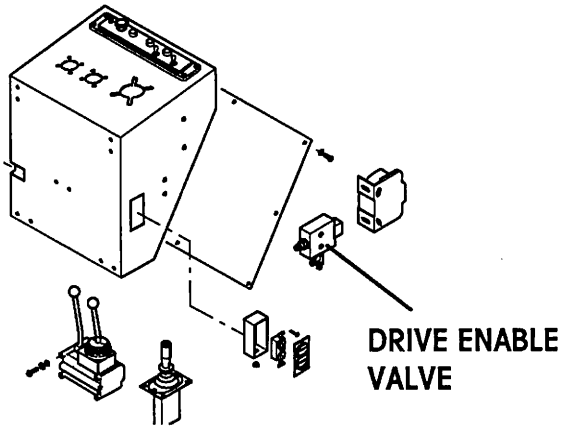
Motion Control Valve Assembly.

SOLENOID VALVE

The solenoid valve controls an orifice to allow for a gradual stop before the brakes are applied.

DRIVE ENABLE VALVE

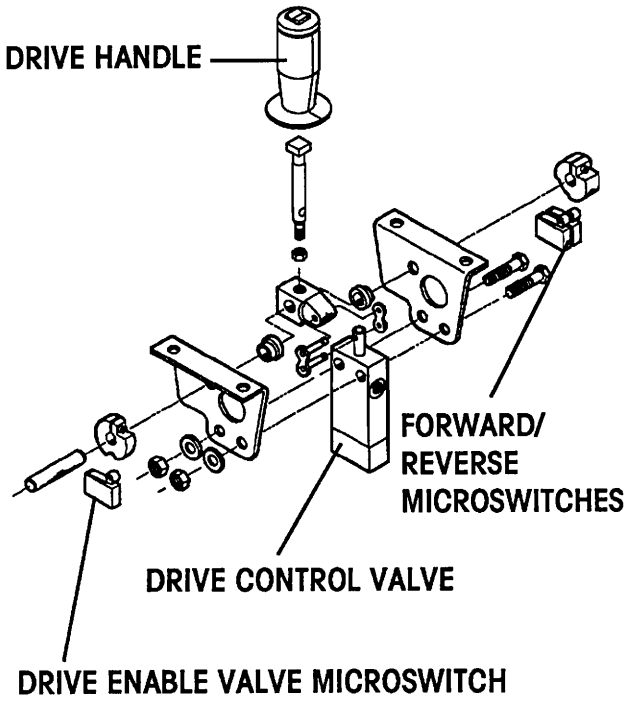
The drive enable valve is a two-way valve which when open allows fluid to go to the drive handle to control the pump output flow. This vavle is normally closed for boom functions.



Drive Enable Valve.

PLATFORM DRIVE CONTROL HANDLE

The platform drive control handle is a proportional control valve which controls the displacement of the main hydraulic pump and, therefore; proportionally controls drive speed.



Platform Drive Control Valve and Handle.

SECTION 4:
ELECTRICAL SYSTEM

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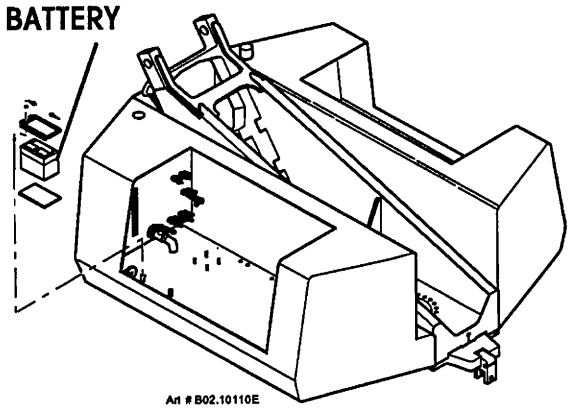
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ELECTRICAL SYSTEM

Following is a description of the major components of the Trailblazer electrical system.

BATTERY

One 12 volt battery supplies the electrical current required to start the engine and supply emergency power. The battery is located in the engine side compartment of the superstructure.



12 Volt Battery Location.

BATTERY MAINTENANCE (IN STORAGE)

Follow these procedures for maintenance of stored batteries:

Keep batteries clean. Electrolyte of "wet" batteries should be checked regularly, and kept at proper levels.

"Wet" batteries should be kept fully charged. A "wet" battery, while in storage, should be recharged to full charge at the following intervals:

IF STORED AT:	RECHARGE:
Below 40° F (4° C)	None required
40° to 60° F (4° to 15° C)	Every 2 months
Above 60° F (15° C)	Every month

BATTERY MAINTENANCE (IN USE)

Check batteries and mounting frame for signs of damage or corrosion.

Check battery terminals for:

- **Corrosion.** Regularly clean connections and apply a non-metallic grease or protective spray to retard corrosion.
- **Loose connections.** Be sure all cable connections are tight, and that good contact is made to terminals.
- **Broken or frayed cables.** Be sure all cable connections are good, and that no loose or broken wires are exposed. Replace as needed.

Check battery electrolyte level. Replenish the electrolyte, if necessary.

⚠WARNING

NEVER ADD ADDITIONAL ACID TO THE BATTERY.

Remove vent caps before filling, and USE ONLY DISTILLED WATER. Fill all cells to the proper level. Do not overfill. Fill to level indicator (or 1/2 inch over the top of the separators if there is no level indicator). Do not use a hose to add water to battery.

Allowing the electrolyte level to drop below the top of the separators will lead to shortened battery life. Excessive water usage can indicate that a battery has been overcharged, subjected to excessively high temperatures, or is nearing the end of its service life.

Keep battery clean. Wash the top of the battery, making sure the vent caps are in place. Do not allow cleaning water or other foreign matter to enter the cells. Use a solution of bicarbonate of soda and water to wash the battery if there is an accumulation of acid.

BATTERY TROUBLESHOOTING

Once a month:

- Check all cells with a hydrometer for variation in specific gravity. A fully charged battery should indicate between 1.25 and 1.28 specific gravity. A variation of 0.03 points or more between cells is an indication that the battery should be replaced. Mark the low cells.

BATTERY REPLACEMENT

To remove the battery, follow these procedures:

⚠WARNING

BEFORE REMOVING BATTERY FROM THE UNIT, TURN OFF THE IGNITION SWITCH. THERE SHOULD BE NO POWER TO THE MACHINE.

Be sure all power to the machine is shut off. Disconnect the battery cables.

⚠ CAUTION

Always disconnect the negative battery cable first.

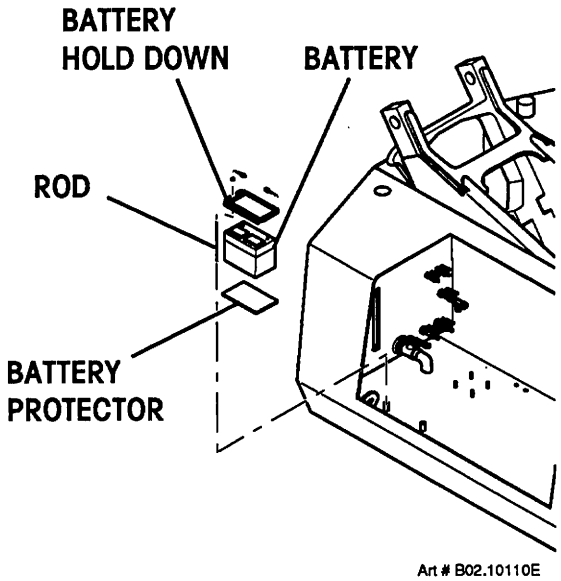
Remove the nut, washer, rod and hold down bracket holding the battery to the superstructure.

Carefully lift the battery from the superstructure. Set aside and dispose of properly.

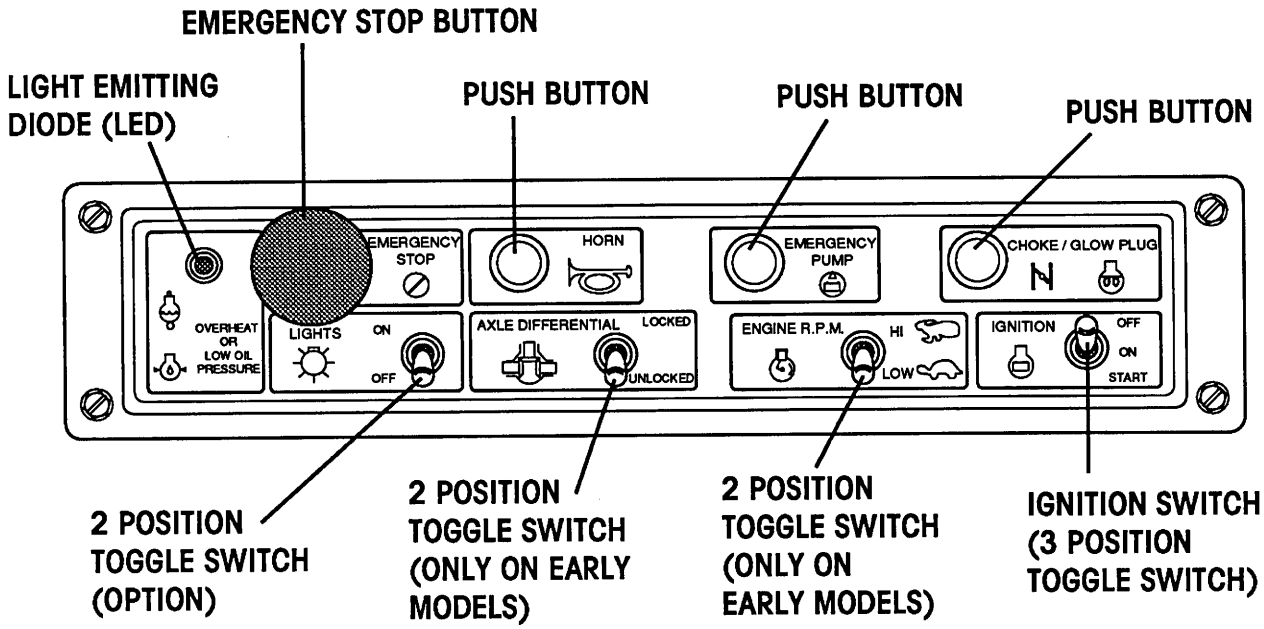
To install the battery, place the battery in its proper location. Position the battery hold down bracket and install rod, washer and nut. Connect the battery cables.

⚠ CAUTION

Always connect the positive battery cable first.



12 Volt Battery.



Platform Control Box.

PLATFORM CONTROL BOX

EMERGENCY STOP BUTTON

The emergency stop button acts as a power "ON/ OFF" switch. Both switches (one on the ground control box and one at the platform control panel) must be "ON" to operate the machine. When either of the emergency stop buttons is depressed, all functions stop immediately, including the engine, and the wheel brakes are automatically applied.

When troubleshooting the electrical circuit, check first if either emergency stop button is depressed. If there is a problem with the emergency stop button, check the wiring to the button. If the wiring is correct, replace the emergency stop button.

IGNITION SWITCH

The ignition switch ("START/ ON/ OFF") on the platform control panel acts as a power "ON/ OFF" switch. The switch must be "ON" to operate the machine from the platform. When the ignition switch is flipped to "OFF", all functions stop immediately and the wheel brakes are automatically applied.

If there is a problem with the ignition switch, check the wiring to the switch. If the wiring is correct, replace the switch.

TOGGLE SWITCH

There are two-position toggle switches on the platform control box. If there is a problem with a toggle switch, check the wiring. If the wiring is correct, replace the toggle switch.

PUSH BUTTON

There are push buttons on the platform control box. If there is a problem with a push button, check the wiring. If the wiring is correct, replace the push button.

LIGHT EMITTING DIODE

There is one light emitting diode (LED) on the platform control box. If there is a problem with the diode, check the wiring. If the wiring is correct, replace the diode.

GROUND CONTROL BOX

CIRCUIT BREAKER

There is one 20 amp circuit breaker mounted on the cover of the ground control box.

Check for a tripped breaker and re-set by pushing in the button. If the breaker trips again, the cause of the high current draw must be corrected prior to further operation.

TOGGLE SWITCH

There is one two-position toggle switch on early models and one optional three-position toggle switch on the ground control box. If there is a problem with a toggle switch, check the wiring. If the wiring is correct, replace the toggle switch.

PUSH BUTTON

There are two push buttons on the ground control box. If there is a problem with a push button, check the wiring. If the wiring is correct, replace the push button.

KEY SWITCH

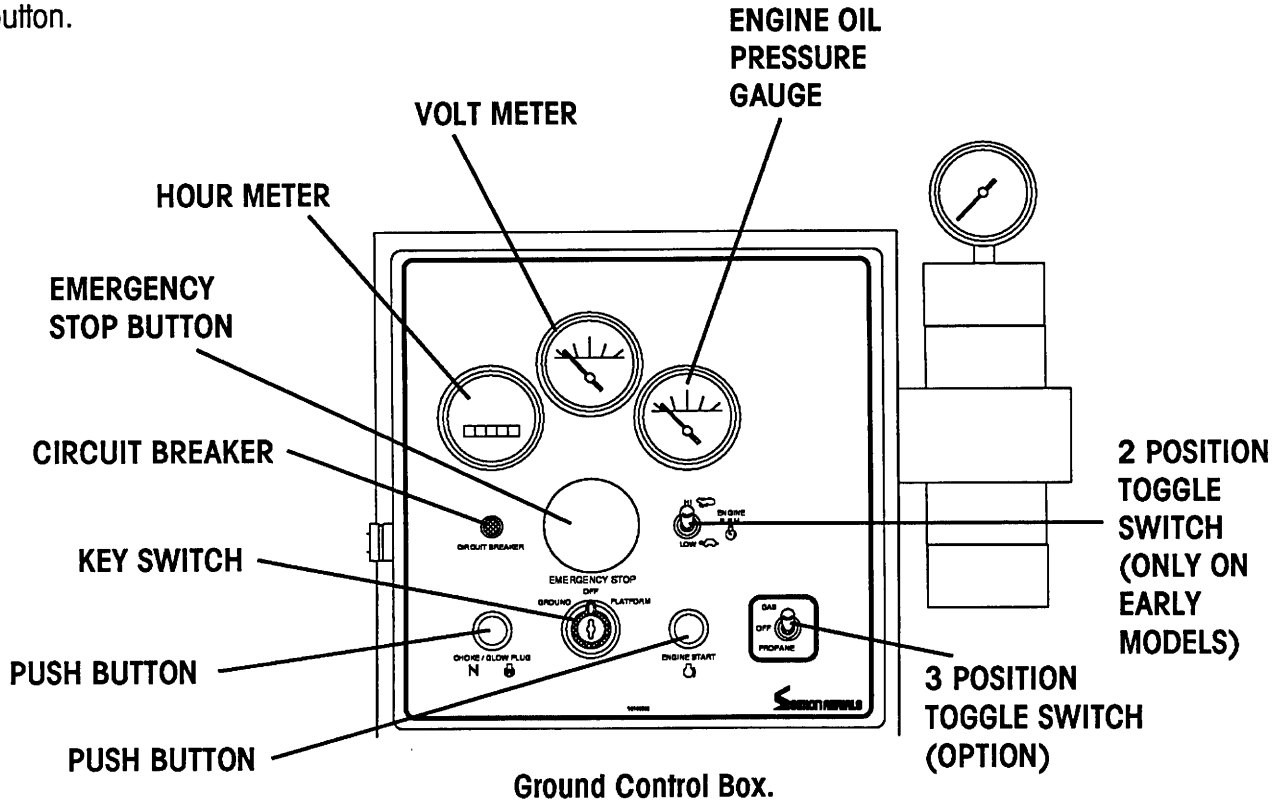
There is a three-position key switch (GROUND/ OFF/ PLATFORM) on the ground control box that acts as a power "ON-OFF"switch. The switch must be in the "GROUND" or "PLATFORM" position to operate the machine. When troubleshooting the electrical circuit, make sure the key switch is in the correct position. If there is a problem with the key switch, check the wiring. If the wiring is correct, replace the key switch.

VOLT METER

The volt meter indicates the current battery charge. If there is a problem with the volt meter, check the wiring. If the wiring is correct, replace the meter.

HOUR METER

The hour meter indicates total elapsed time the machine has been operated in hours and tenths. If there is a problem with the hour meter, check the wiring. If the wiring is correct, replace the meter.



Ground Control Box.

ENGINE OIL PRESSURE GAUGE

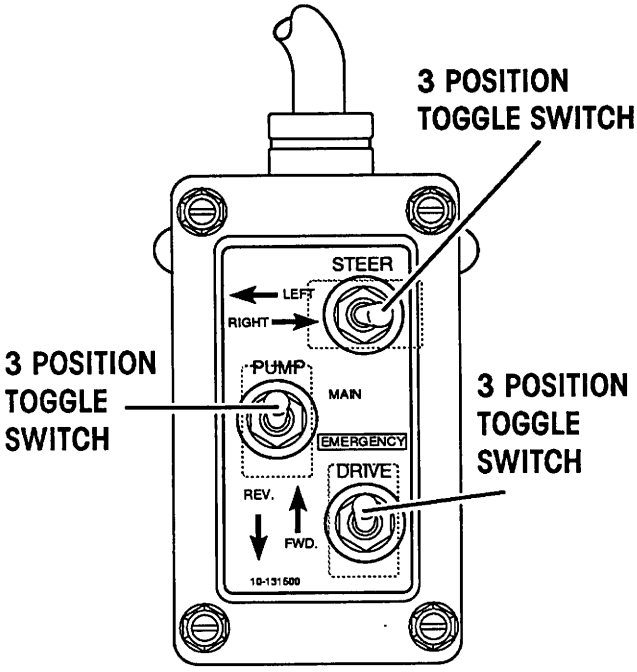
The engine oil pressure gauge indicates the engine oil pressure. If there is a problem with the engine oil pressure gauge, check the wiring. If the wiring is correct, replace the gauge.

PENDANT CONTROL

The pendant control is located on the superstructure, behind the control side door.

TOGGLE SWITCH

There are three three-position toggle switches. If there is a problem with a toggle switch, check the wiring. If the wiring is correct, replace the toggle switch.



Pendant Control.

FOOT PEDAL SWITCH

The foot pedal is located on the platform floor. The foot pedal is a double pole, double throw electrical switch which must be fully depressed before any machine function can be operated from the platform. When the foot pedal switch is released, power to the diverter valve solenoid and drive valve solenoids is terminated, and all machine functions stop. The engine continues to run.

When troubleshooting the electrical and hydraulic circuits to the platform, ensure that the foot pedal switch is depressed. Check the wiring to the foot pedal switch. If the wiring is correct, but there is a problem with the foot pedal circuit, replace the switch.

MOVEMENT ALARM

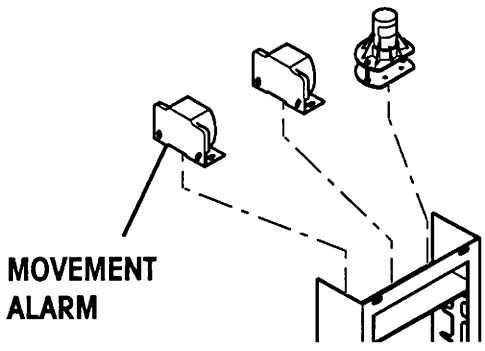
The movement alarm is located on top of the ground control bracket. It is activated as soon as the drive controller on the platform control console or the forward/ reverse toggle switch on the pendant control is moved off the center "Neutral" position.

⚠WARNING

THE MOVEMENT ALARM IS PROVIDED FOR YOUR PROTECTION, AND THE PROTECTION OF PERSONS WORKING IN THE IMMEDIATE AREA.

DISABLING THIS IMPORTANT SAFETY DEVICE MAY RESULT IN DEATH OR SERIOUS INJURY.

If the movement alarm does not function, check the wiring. If wiring is correct, replace the alarm.

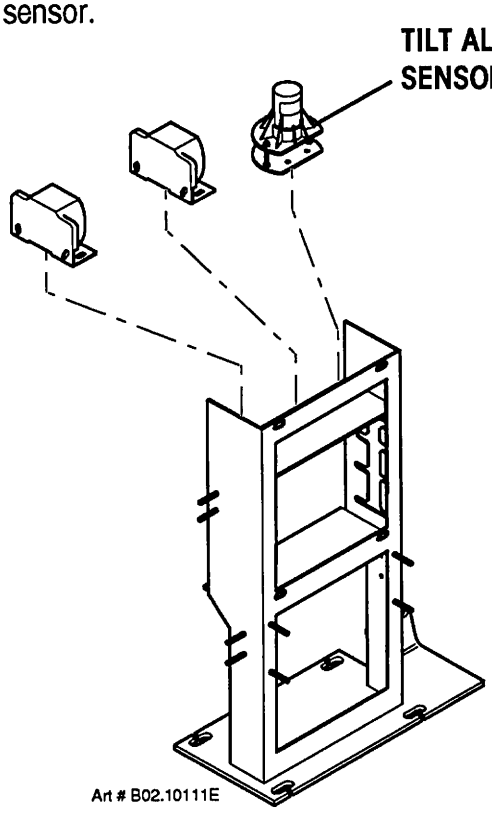


Movement Alarm.

TILT ALARM

The tilt alarm gives an audible warning when the machine is five degrees or more out of level. The alarm can be tested by manually tipping the alarm sensor (see "Tilt Alarm Test" procedure). If the tilt alarm does not function, check the horn, then check the output relay in the ground control box.

Check the wiring. If wiring is correct, replace the alarm sensor.



Tilt Alarm.

TILT ALARM TEST

Check the tilt alarm daily with the boom extended. Individually push down and hold for 10 seconds each of the three fastened corners of the tilt alarm sensor. There should be enough travel to cause the alarm to sound as each corner is pressed. If not, the flange nuts have been tightened too far. Loosen the nut on the 90° corner and perform the adjustment procedure. This "Push-to-Test" feature enables the tilt alarm to be tested without losing its adjustment.

TILT ALARM SENSOR ADJUSTMENT

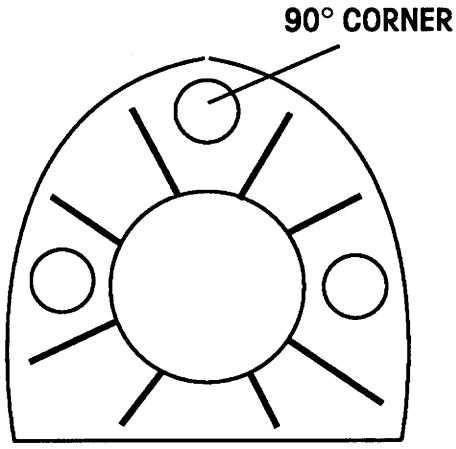
The tilt alarm sensor can be adjusted. Before attempting to adjust the sensor, park the machine on a flat, level surface.

Level the base of the sensor by tightening each of the three flange nuts to take up approximately one half of its spring's travel. During the remainder of the adjustment procedure, DO NOT ADJUST THE NUT ON THE 90° CORNER.

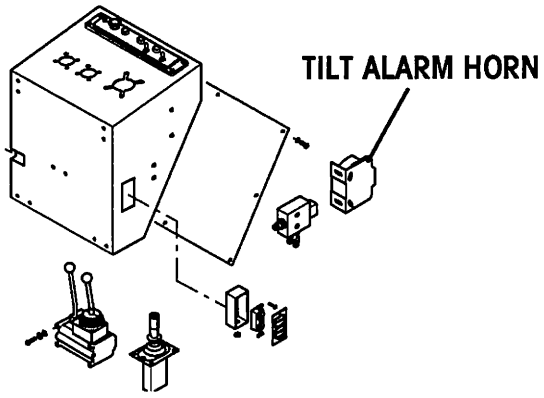
Check to be sure the electrical connections are correct. Slowly tighten the nut on one of the two corners ADJACENT to the 90° corner until the light-emitting diode (LED) just turns on, indicating that the circuit is closed. Note the position of the nut.

Loosen the nut (LED will go out), carefully counting the number and fraction of turns until the LED lights up again. Divide that number by two and tighten the nut by this number of turns.

Adjust the nut on the OTHER corner adjacent to the 90° corner in the same manner. The alarm is now level, to the degree of accuracy determined by the nut adjustments and the surface on which the machine is sitting. Test the tilt alarm for proper function.



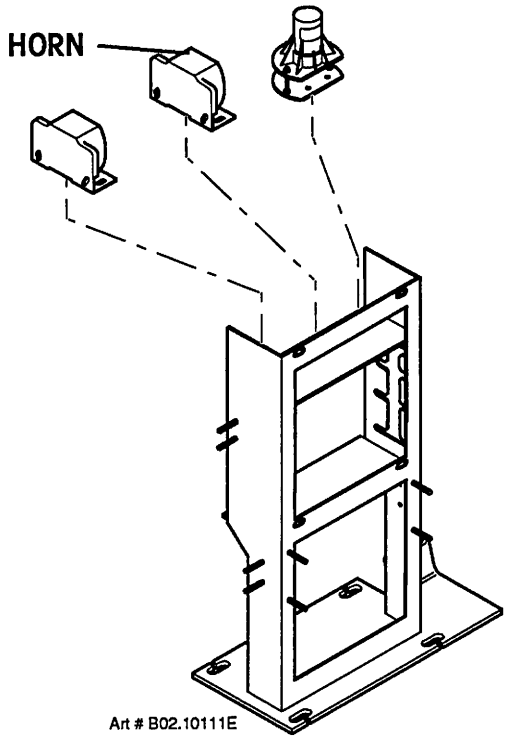
Tilt Alarm 90° Corner.



Tilt Alarm Horn.

TILT ALARM HORN

The horn gives an audible warning. If the horn does not function, check the wiring. If wiring is correct, replace the horn.



Horn.

HORN

The horn gives an audible warning. If the horn does not function, check the wiring. If wiring is correct, replace the horn.

RELAYS

There are a number of relays associated with machine functions that are located in the ground control box (refer to Electrical Schematic at the back of this manual). If faulty replace.

LIMIT SWITCHES

There are two limit switches located on the unit as safety devices for boom hoist and boom telescope functions. The boom telescope limit switch is located on the lower right side of the base boom. The boom hoist limit switch is located on the right side of the pylon weldment of the superstructure.

Unless the boom hoist and telescope limit switches are closed as shown on the unit electrical schematic at the end of this manual, the unit will only be able to travel at creep speed. Replace any faulty limit switches.

SECTION 5:
MECHANICAL COMPONENTS

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MECHANICAL COMPONENTS

Following is a description of the major mechanical components of the Trailblazer 40.

TIRES

Tires used are calcium or optional foam filled. Inspect tires for cuts, sidewall damage or abnormal wear. Any tire faults MUST BE CORRECTED before further machine operation.

CHANGING TIRES

⚠WARNING

CALCIUM FILLED AND/OR FOAM FILLED TIRES ARE EXTREMELY HEAVY. CARE MUST BE TAKEN TO AVOID PERSONAL INJURY.

When a tire change is necessary, follow these steps:

⚠ CAUTION

ALWAYS BLOCK THE WHEELS before you raise the machine.

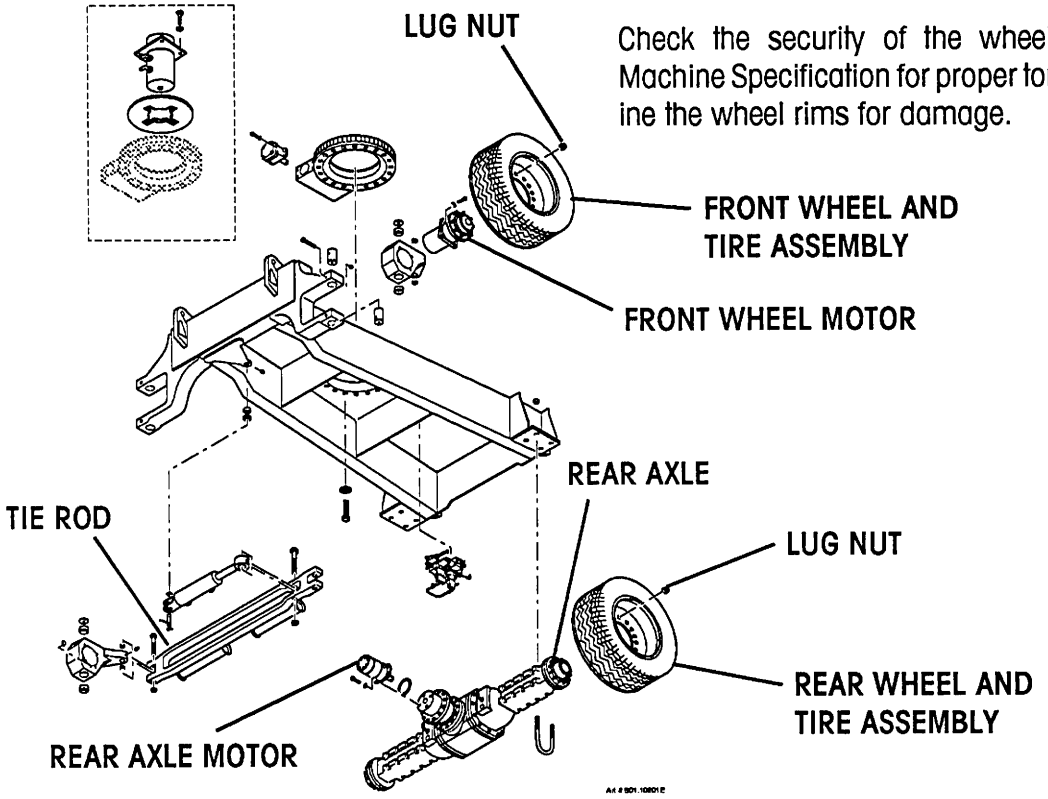
- Loosen and remove lug nuts, and pull off the wheel and tire assembly.
- Replace the tire and reinstall.

  NOTE: Tire should have the correct amount of calcium.

- Fasten lug nuts and tighten to proper torque (see Machine Specifications).
- Lower the machine and remove the blocks.

WHEELS AND LUG NUTS

Check the security of the wheel lug nuts (see Machine Specification for proper torque) and examine the wheel rims for damage.



Undercarriage Mechanical Components.

WHEEL MOTOR ASSEMBLY

- Check for any leaks. Check for proper operation. Replace hydraulic wheel motor if damaged.

- To remove front wheel motor:

  1. Block the rear wheels and raise the machine at the front end.

⚠WARNING

CALCIUM FILLED AND/OR FOAM FILLED TIRES ARE EXTREMELY HEAVY. CARE MUST BE TAKEN TO AVOID PERSONAL INJURY.

  2. Loosen and remove the lug nuts and remove tire and wheel assembly.

⚠ CAUTION

Plug all open hydraulic fittings to prevent contamination by dirt or other foreign objects.

  3. Disconnect hoses to the wheel motor.

  4. Loosen and remove four capscrews and helical lockwashers holding the wheel motor.

  5. Remove all fittings.

  6. Slide out wheel motor from motor housing.

- Install front wheel motor:

  1. Align the wheel motor in the motor housing.

  2. Install and torque the four capscrews with helical lockwashers. See "Machine Specification".

  3. Install all fittings.

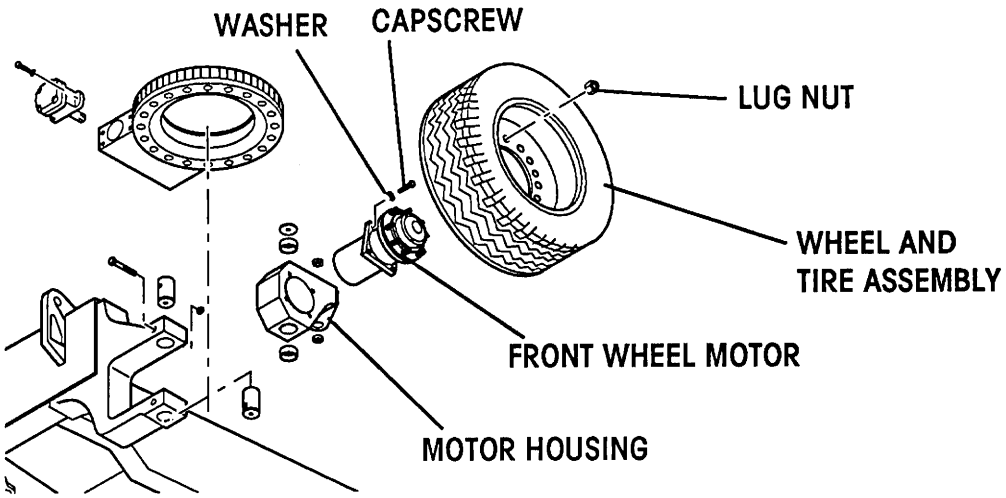
  4. Connect hydraulic hoses to the wheel motor assembly.

⚠WARNING

CALCIUM FILLED AND/OR FOAM FILLED TIRES ARE EXTREMELY HEAVY. CARE MUST BE TAKEN TO AVOID PERSONAL INJURY.

  5. Position tire and wheel assembly and install and torque lug nuts. See "Machine Specification".

  6. Lower the machine and remove the rear wheel blocks.



Front Tire and Wheel Assembly, and Wheel Motor.

STEER CYLINDER

The steer cylinder is of the double acting type. Check the cylinder for hydraulic fluid leaks.

STEER CYLINDER PINS

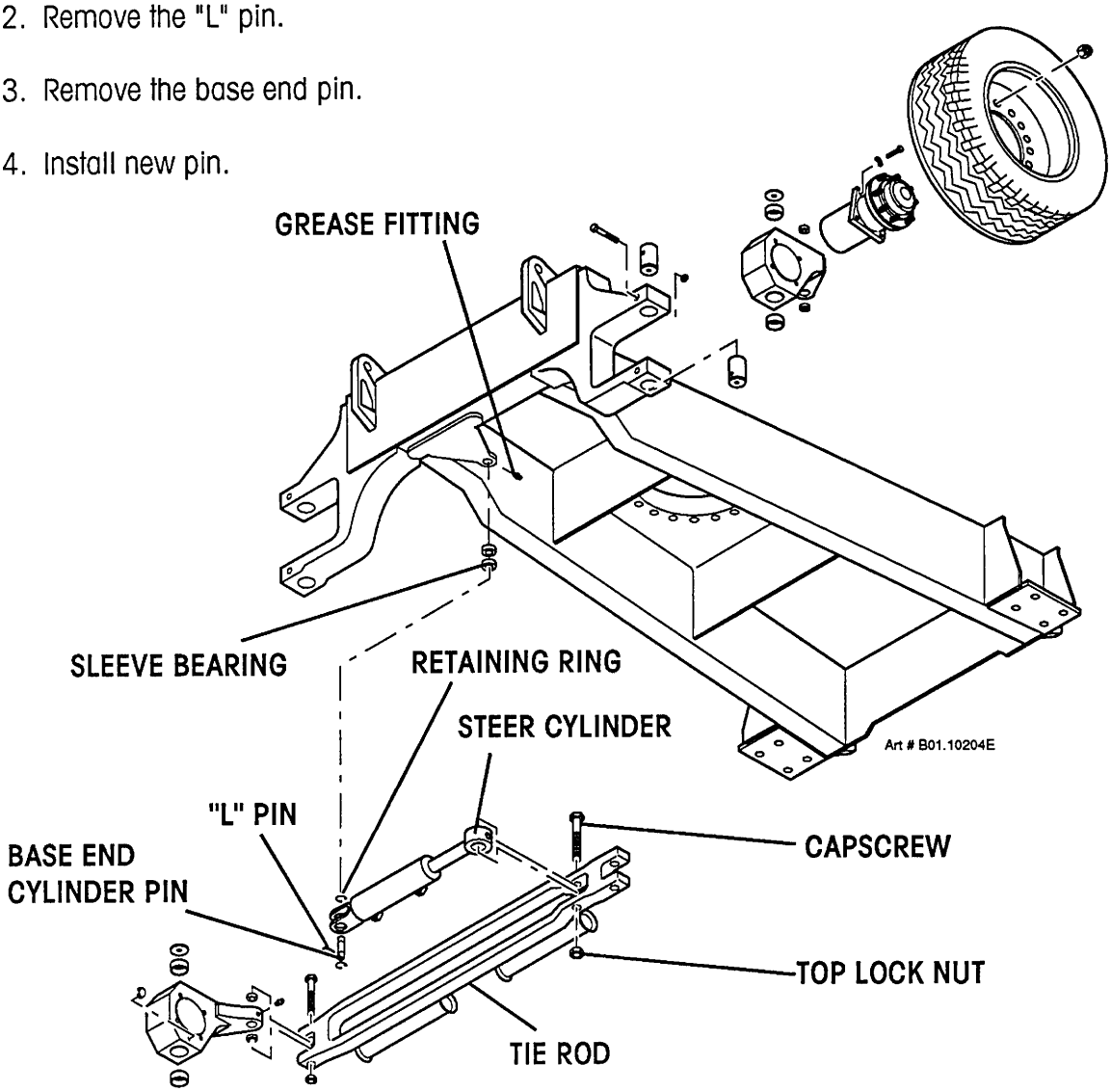
Check all pins for wear. If base end pin rotates, check for a missing retaining ring or "L" pin. If wear is detected, the pin must be replaced.

Base End Cylinder Pin Replacement

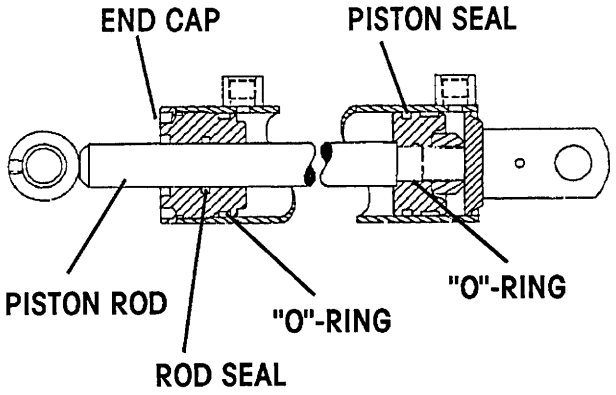
1. Remove retaining ring.
2. Remove the "L" pin.
3. Remove the base end pin.
4. Install new pin.
5. Install "L" pin and retaining ring.
6. Apply grease to sleeve bearing.

STEER CYLINDER SEAL REPLACEMENT

1. Disconnect the hydraulic hoses.
2. Remove the base end steer cylinder pin.
3. Remove capscrew and top lock nut holding the steer cylinder rod end.
4. Remove the cylinder.



Steer Cylinder and Tie Rod Assembly.



Steer Cylinder.

5. Clean the cylinder.

6. Loosen the end cap and withdraw it over the piston rod.

⚠ CAUTION

Take care not to damage the rod surface and guard against dirt entering the system.

7. Remove the rod and piston assembly.

8. Replace the seals and "O"-rings.

9. Install the rod and piston assembly.

10. Install and tighten the end cap.

11. Install cylinder.

    - Position steer cylinder base end.
    - Install base end steer cylinder pin.
    - Install capscrew and top lock nut holding the steer cylinder rod end.

12. Connect the hydraulic hoses.

TIE ROD ASSEMBLY

Check for a bent or broken tie rod assembly. Replace if bent or broken.

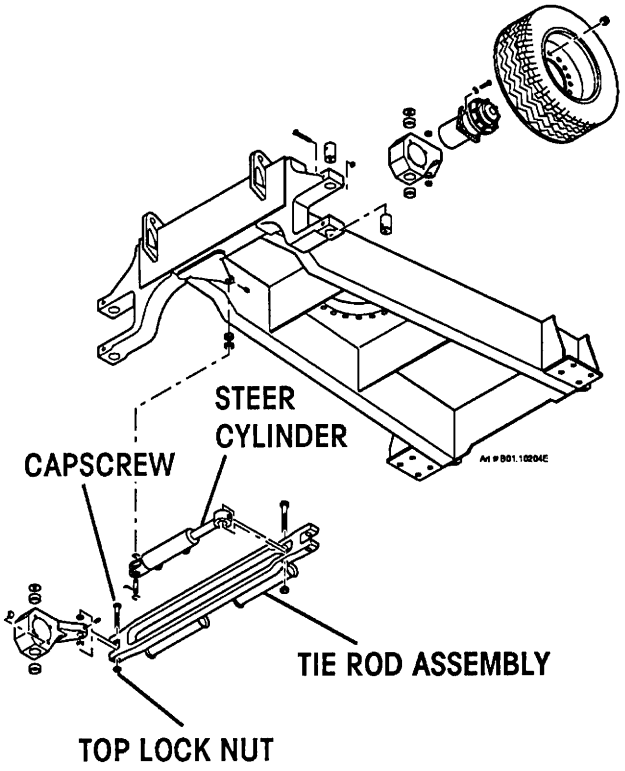
TIE ROD ASSEMBLY REPLACEMENT

1. Remove capscrews and top locknuts at both ends and steer cylinder rod end.

2. Remove tie rod assembly.

3. Install new tie rod assembly and attach it with the capscrews and top locknuts.

4. Install rod end of steer cylinder.



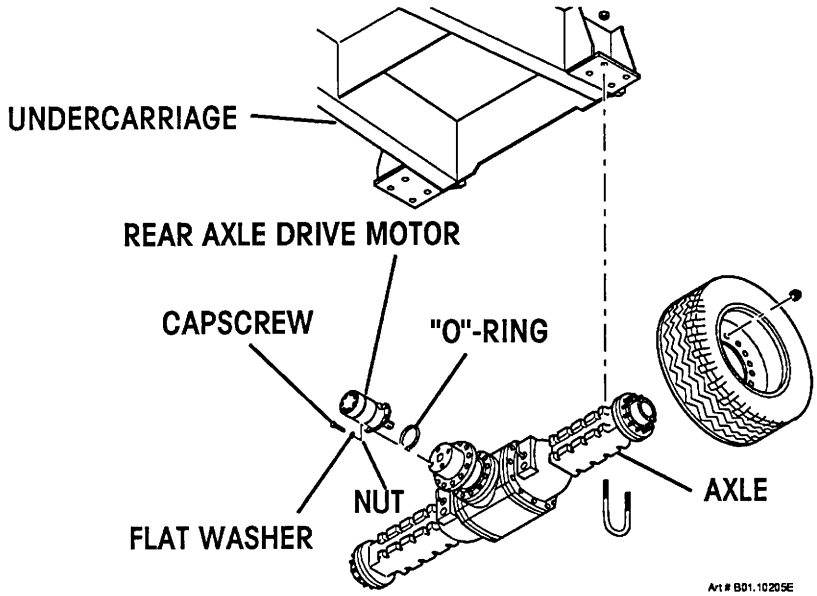
Steer Cylinder and Tie Rod Assembly.

REAR AXLE DRIVE MOTOR

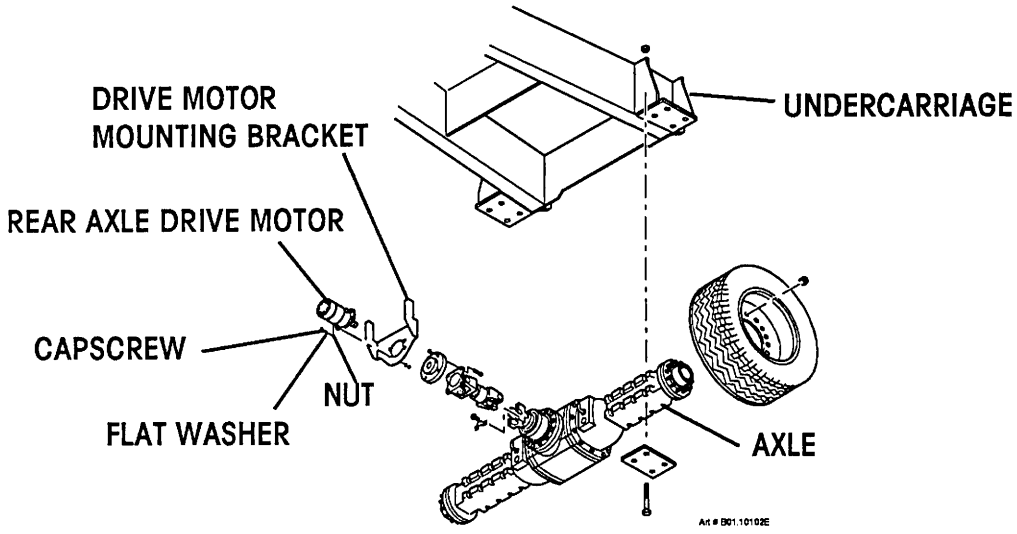
Check for any leaks. Check for proper operation. Replace rear axle drive motor if damaged.

REAR AXLE DRIVE MOTOR REPLACEMENT

1. Block the front wheels and raise the rear of the machine.
2. Remove the capscrews, flat washers and nuts (only on some early axles) holding the motor to the axle.
3. Remove the rear axle drive motor.
4. Remove the "O"-ring.
5. Install a new "O"-ring.
6. Install the rear axle drive motor.
7. Install capscrews, flat washers and nuts (only on some early axles).
8. Torque the capscrews. See "Machine Specifications".



Rear Axle Drive Motor (later model).



Rear Axle Drive Motor (early model).

REAR AXLE ASSEMBLY

Check for any leaks. Check for proper operation. Check for any bearing or gear damage. Replace rear axle assembly if components can't be replaced.

REAR AXLE ASSEMBLY REPLACEMENT

To remove the rear axle assembly:

⚠ CAUTION

ALWAYS BLOCK THE WHEELS before you raise the machine.

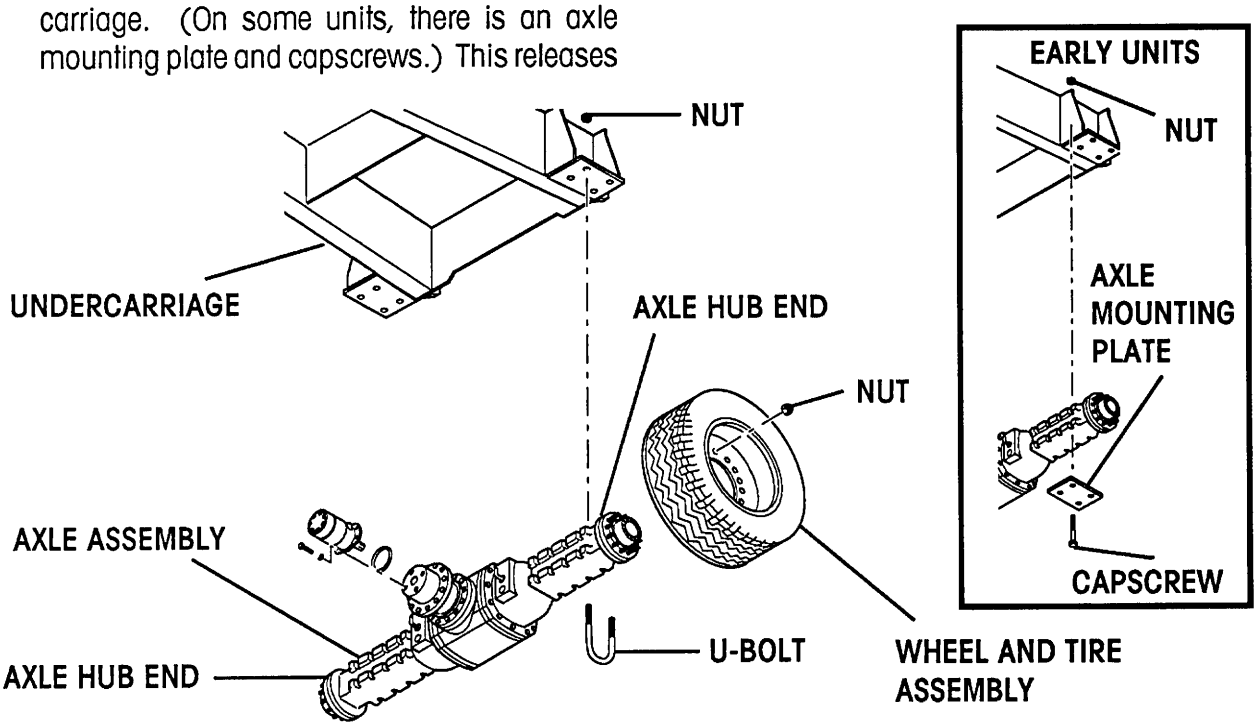
1. Block the front wheels.
2. Raise the rear of the machine and support the undercarriage structure.
3. Remove both rear wheel and tire assemblies.
4. Support both axle hub ends with a crane and chains.
5. Remove the "U"- bolts and nuts from the undercarriage. (On some units, there is an axle mounting plate and capscrews.) This releases the axle assembly. Carefully lower the axle to the ground.

⚠ CAUTION

DO NOT let the axle drop. You may damage the axle.

To install the rear axle assembly:

1. Support both axle hub ends with a crane and chains.
2. Position the rear axle assembly to align with the undercarriage mounting holes.
3. Install "U" - bolts and nuts. (On some units, there is an axle mounting plate and capscrews.)
4. Remove the support chains.
5. Install rear wheel and tire assemblies. Fasten lug nuts and tighten to proper torque (see Machine Specifications).
6. Lower the machine and remove the blocks.



Rear Axle Assembly.

REAR AXLE BRAKE ADJUSTMENT

1. Remove the socket head center plug on the brake cover. Install a dial indicator shaft to the end of the brake actuator shaft to measure the travel of the shaft. Indicator shaft must be in the same plane as the actuator shaft.

2. Set the dial indicator at "0" setting. Remove the hydraulic line fitting just below the actuator shaft. Install bolt (M10 x 1)where the hydraulic line fitting was removed and screw to maximum depth to disengage the failsafe brake.

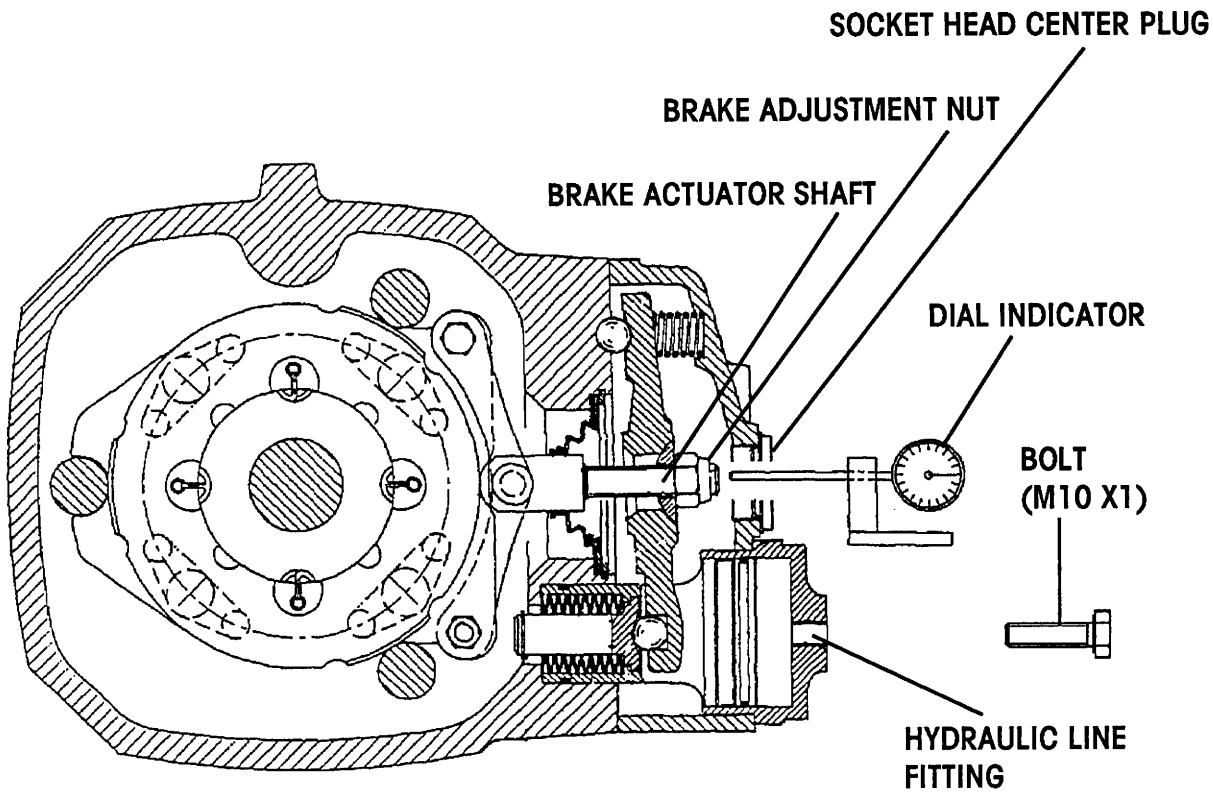
3. Read the indicator setting. The proper setting range is 0.059 - 0.079 inch (1.5 - 2.0 mm). If the indicator setting is out of this range, the indicator should be removed so the brake adjustment nut can be adjusted to the proper shaft travel.

4. Adjust the brake adjustment nut.

5. Install the dial indicator shaft to the end of the actuator shaft and adjust the dial setting to "0".

6. Back out the bolt (M10 x 1) until the brake engages, bolt will turn free.

7. Read gauge setting. If setting is not in the proper range 0.059 - 0.079 inch (1.5 - 2.0 mm), repeat steps 4, 5 and 6 until the proper setting is obtained.

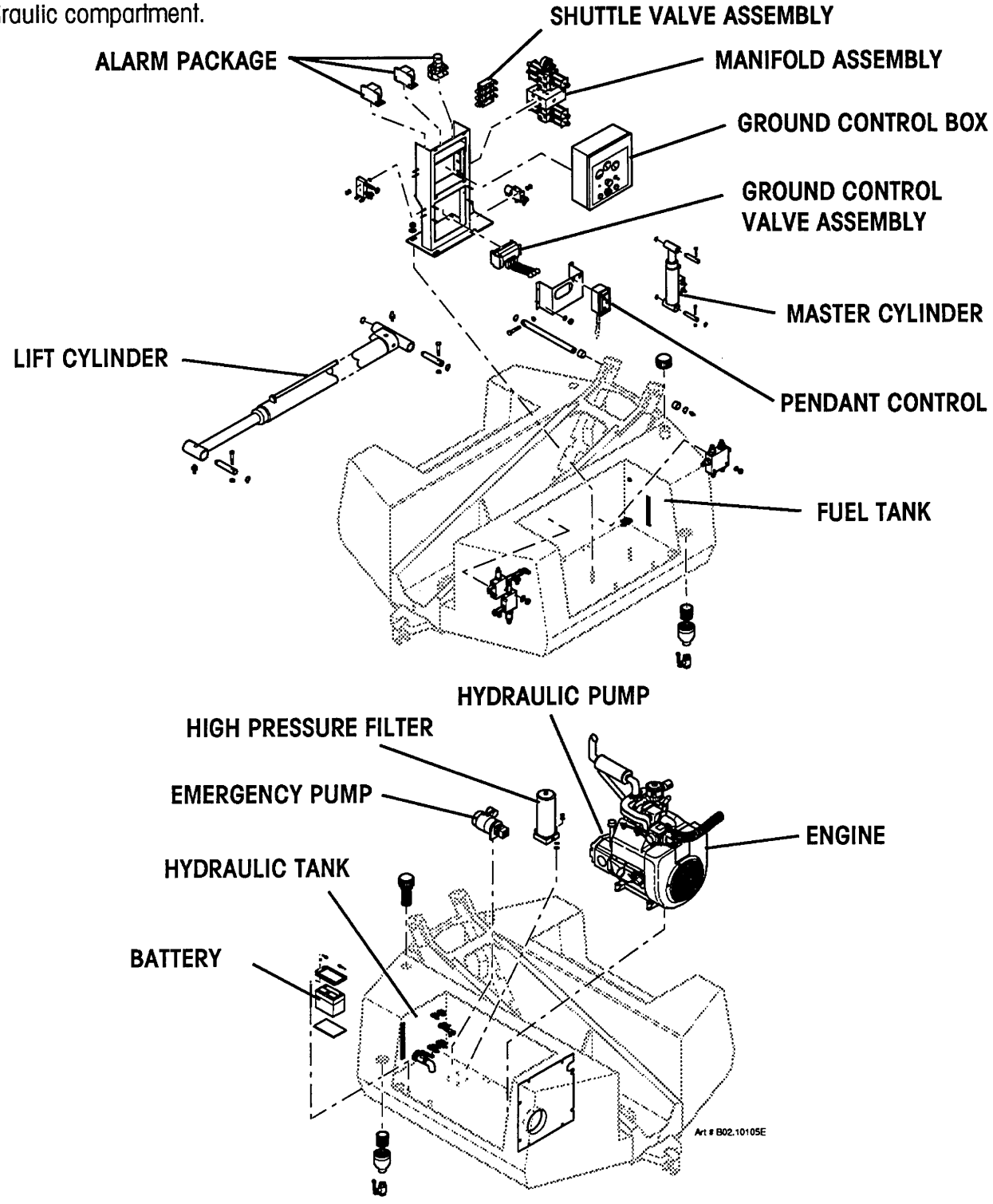


Spring Applied Hydraulic Release Brake.

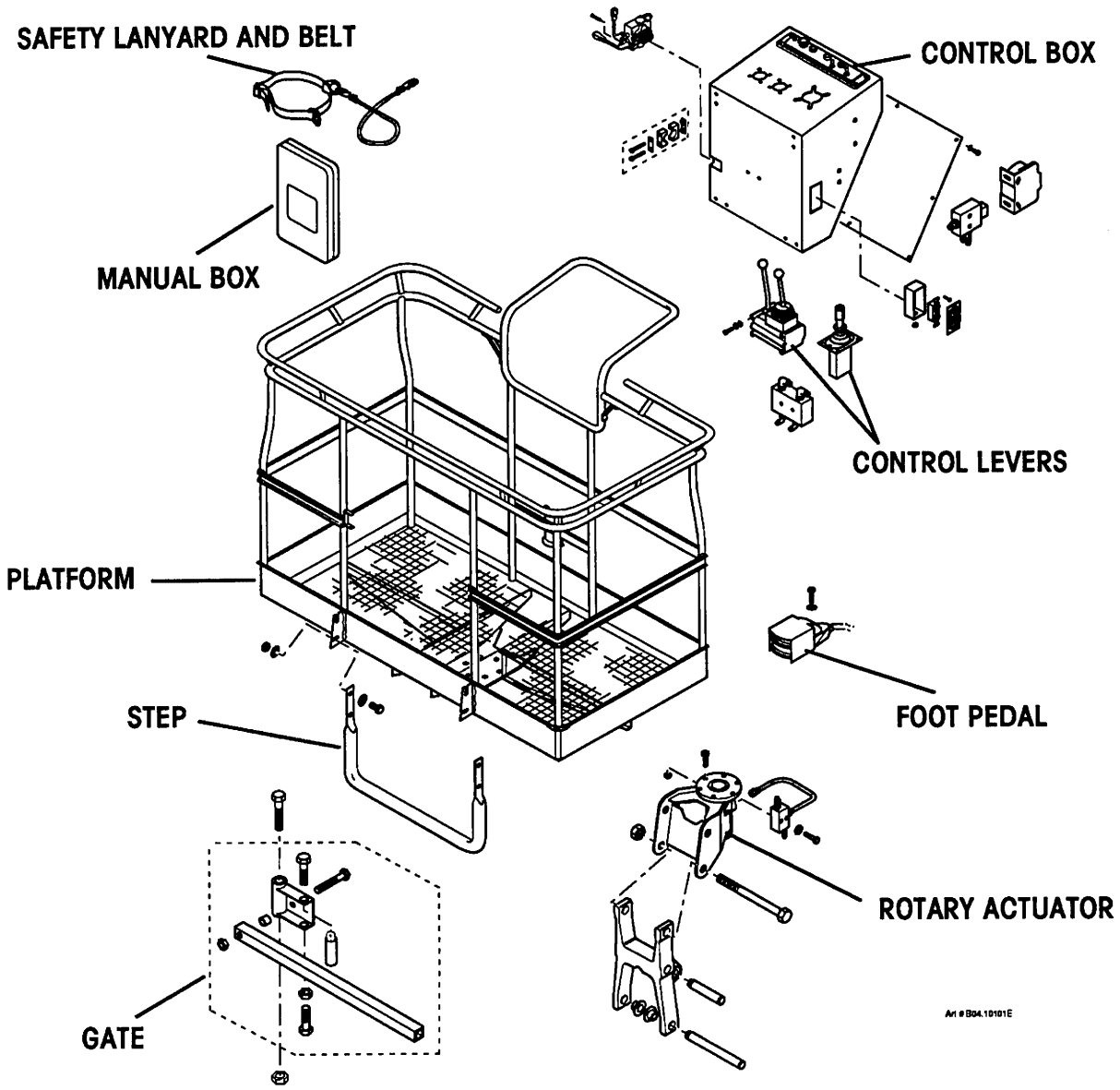
SUPERSTRUCTURE

The superstructure consists of two compartments; one is the engine compartment and the other is the hydraulic compartment.

Steam clean the superstructure once a year, and inspect all welds and brackets. Check for cylinder pins that turn in their mountings, which will indicate sheared pin lock bolts.



Components Found on the Superstructure.



Platform Components.

PLATFORM

Steam clean the platform and inspect all welds and brackets. Check all the hydraulic and electrical components.

HOSES AND CABLES

Inspect all hoses and electrical cables for security and damage. Check for leaks at fittings. ANY DAMAGED HOSES OR CABLES SHOULD BE REPLACED.

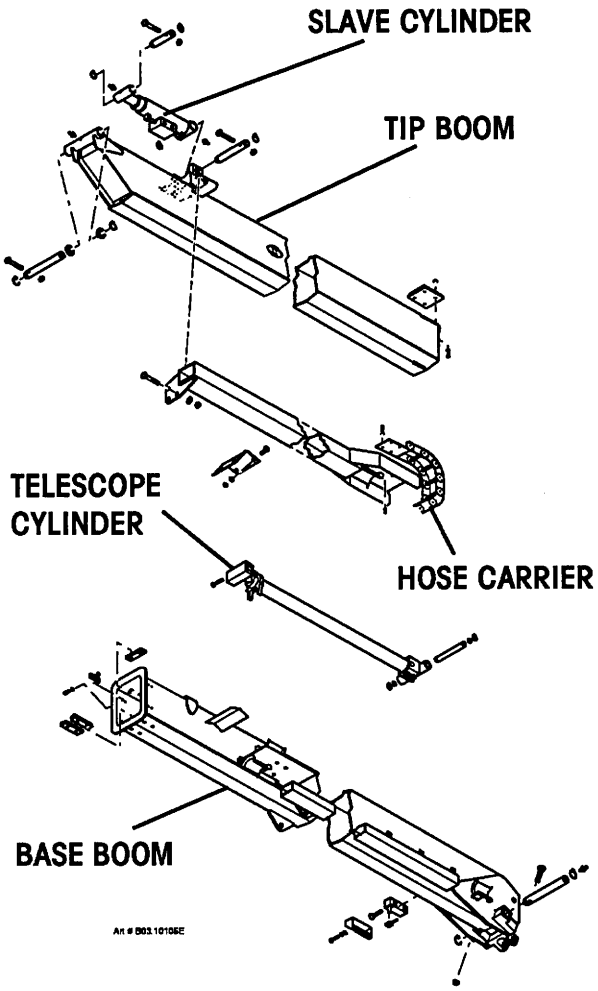
Cables and hoses should be examined for rubbing and chafing, especially in the swing bearing area and the hose track area.

MISCELLANEOUS EQUIPMENT

Check all miscellaneous equipment mounted on the machine for secure attachment. Check for evidence of oil or hydraulic fluid leakage.

BOOM

Clean the boom once a year and inspect along the boom structure, especially all welds and brackets.



Boom Components.

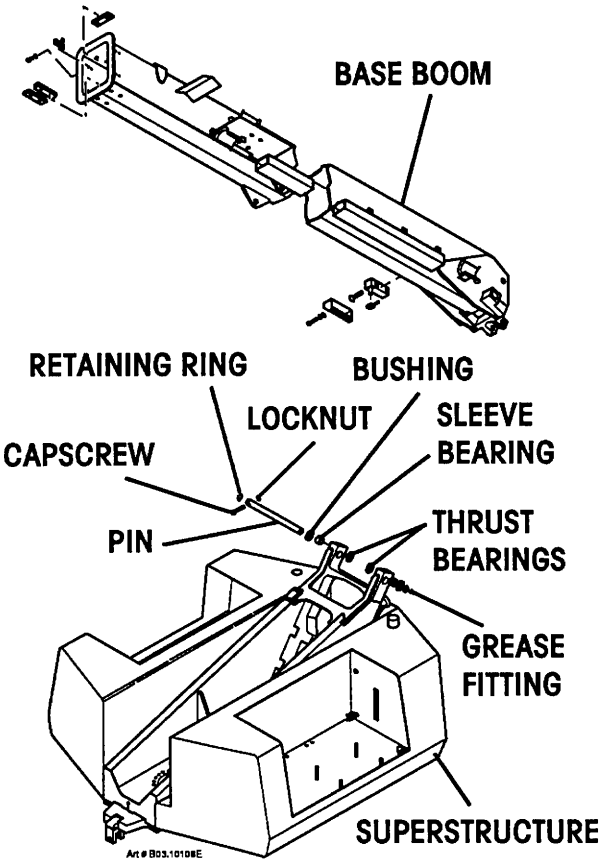
BOOM PIVOT PIN AND BUSHING REPLACEMENT

IMPORTANT: It is NECESSARY TO MAINTAIN THE CORRECT ALIGNMENT between the boom and pylon weldment during this operation. Any relative movement will make fitting of the pin more difficult.

⚠WARNING

THE BOOM WILL FALL IF NOT SUPPORTED WHEN THE PIVOT PIN IS REMOVED.

1. SUPPORT THE BOOM securely (on a boom stand or similar rigid platform).
2. Remove the retaining rings, capscrew, and locknut and drive out the boom pivot pin, taking care not to damage the inner bore, bushings, sleeve bearings or thrust bearings.
3. Check bushings, sleeve bearings and thrust bearings and replace if necessary.
4. Install new pivot pin.
5. Install capscrew, locknut and retaining rings.
6. Apply grease to pin through the grease fitting.



Boom Pin and Bushing.

WEAR PADS

Wear to boom sections, due to in and out movement, is prevented by the installation of nylon wear pads at several points along the boom length. The nylon wear pads should be checked for wear approximately every six months. Fully retract the boom, and check the gap between the wear pad and the boom section.

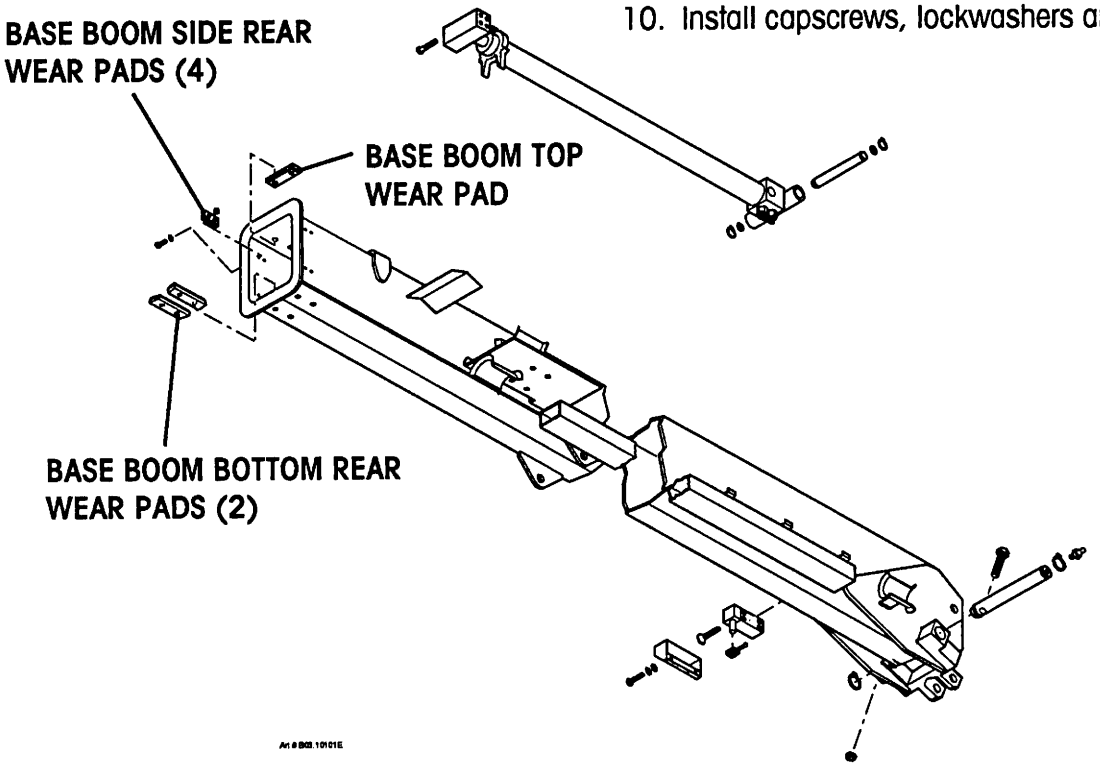
Wear pads are located at the top front of the tip boom and at the top, bottom and side rear of the base boom. There is also a moving anchor wear pad mounted on a weldment located on the side of the base boom.

⚠ CAUTION

If a pad wears to approximately 3/8" (9.5 mm) thick, it should be replaced or shimmed. Generally, only the bottom pad at the upper end and the top pad at the lower end of the boom will show wear.

Base Boom Top Wear Pad Replacement

1. Fully retract and lower the boom.
2. Remove the capscrews, lockwashers and jam nuts holding the top and side wear pads.
3. Slide out the top and side wear pads.
4. Use a crane to hold the tip boom section off the bottom wear pad.
5. Remove the capscrews, lockwashers and jam nuts holding the bottom wear pad.
6. Remove the bottom wear pad.
7. Install new bottom wear pad with capscrews, lockwashers and nuts.
8. Rest the tip boom section on the new bottom wear pad.
9. Install new base boom top and side wear pads.
10. Install capscrews, lockwashers and jam nuts.



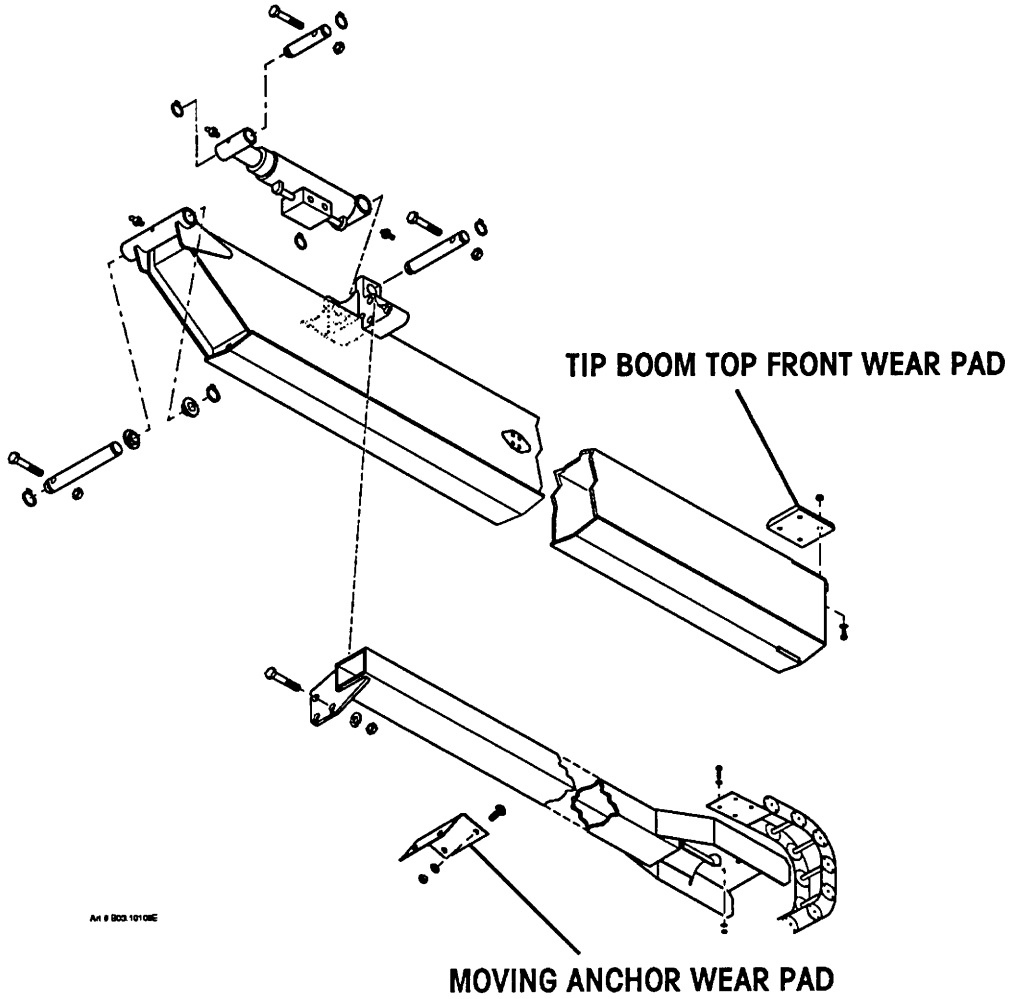
Base Boom Wear Pads.

Tip Boom Top Front Wear Pad Replacement

1. Fully retract the boom and support the boom in the horizontal position.
2. Remove the telescope cylinder pin retaining rings and flat washers.
3. Remove telescope cylinder pin and lower the end of the telescope cylinder.
4. Access can now be gained to the tip boom top front wear pad retaining bolts, lockwashers and nuts.
5. Remove bolts, washers and nuts; wear pad will easily fall out.
6. Install new wear pad with bolts, lockwashers and nuts.
7. Raise cylinder and install cylinder pin, retaining rings and flat washers.

Moving Anchor Wear Pad Replacement

1. Fully retract and lower the boom.
2. Remove the capscrews, flat washers and locknuts holding moving anchor wear pad.
3. Remove wear pad.
4. Install new wear pad.
5. Install capscrews, flat washers and locknuts.



Tip Boom Wear Pads.

BOOM LIFT CYLINDER

The boom lift cylinder is of the double acting type. During operation, the cylinder should not leak, but a slight dampness at the rod seal is acceptable. The pins should be checked for wear. Check the pin capscrew for tightness. The cylinder and holding valve should be inspected for fluid leakage, damage and security.

LIFT CYLINDER PIVOT PIN REPLACEMENT

⚠ CAUTION

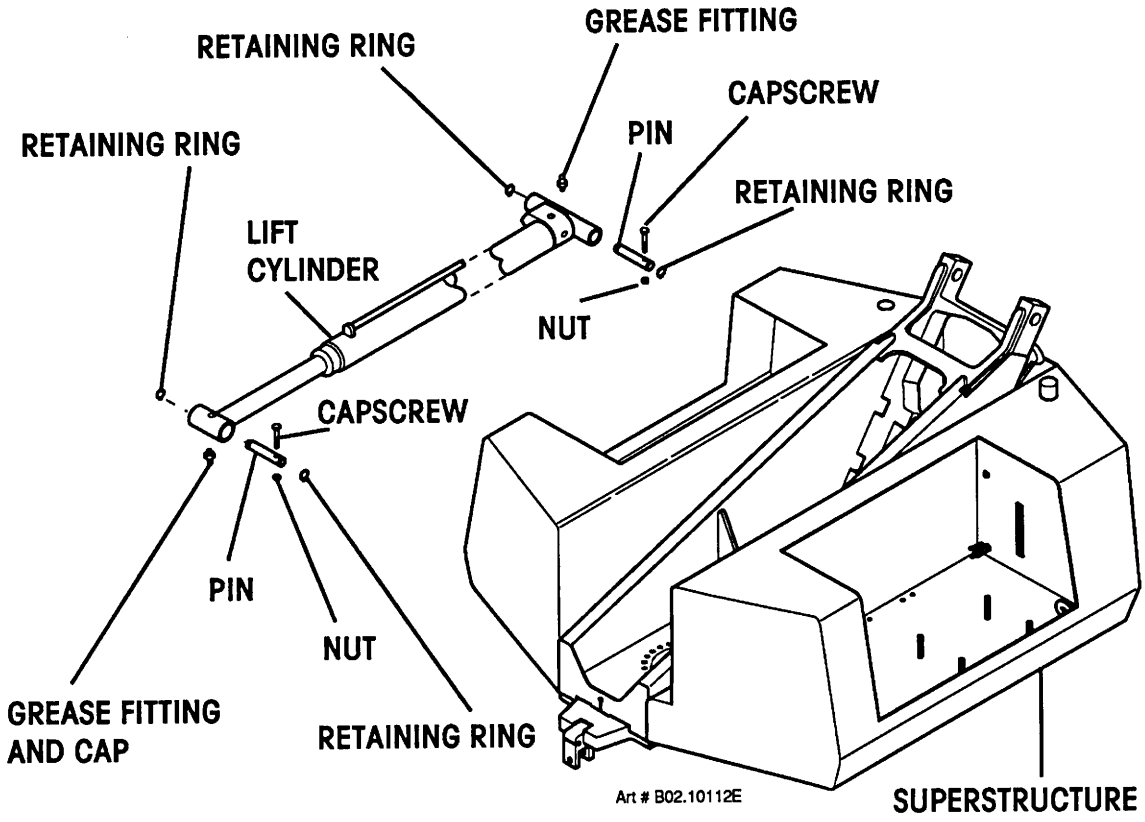
Support the boom any time maintenance is required on the boom or boom cylinders.

1. Support the boom securely (on a boom stand or similar rigid platform).
2. Operate the boom lift control to release hydraulic pressure and remove any load on the lift cylinder.
3. Remove the retaining rings.
4. Remove the capscrews and nuts.

⚠ CAUTION

The cylinder will fall if not supported when the pivot pin is removed.

5. SUPPORT THE LIFT CYLINDER and remove the pin.
6. Install new pin, capscrews, nuts and retaining rings.
7. Apply grease to pin through grease fitting.



Lift Cylinder Pivot Pin.

LIFT CYLINDER SEAL REPLACEMENT (ON MACHINE)

⚠ CAUTION

Support the boom any time maintenance is required on the boom or boom cylinders.

1. Support the boom securely in the horizontal position (on a boom stand or similar rigid platform).
2. Operate the boom lift control to release hydraulic pressure and remove any load in the lift cylinder circuit.
3. Clean the cylinder, and loosen the cylinder end cap by several turns.

⚠ CAUTION

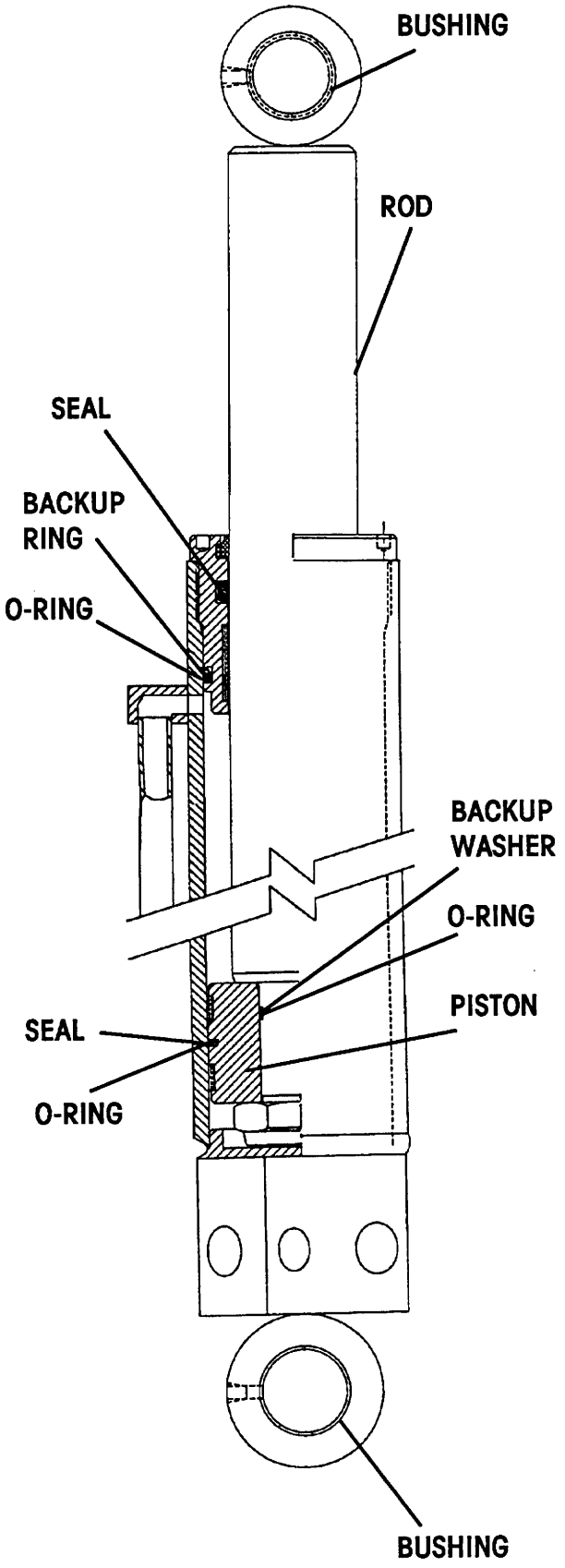
The cylinder barrel will fall if not supported when the pivot pin is removed.

4. Remove the rod end pivot pin, and support the cylinder barrel.
5. Loosen the end cap completely, and withdraw it carefully over the piston rod.

⚠ CAUTION

Take care not to damage the rod surface and guard against dirt entering the system.

6. Remove the rod and piston assembly.
7. Replace the "O"-rings, seals and backup rings.
8. Reassemble the lift cylinder, again AVOIDING DIRT AND ROD DAMAGE.
9. Tighten the end cap.
10. Install rod end pin.



Lift Cylinder.

BENCH REPLACEMENT OF LIFT CYLINDER SEALS

The lift cylinder can also be removed from the machine for seal replacement.

1. Operate boom lift to horizontal position.

⚠ CAUTION

Support the boom any time maintenance is required on the boom or boom cylinders.

2. SUPPORT THE BOOM (on a boom stand or similar rigid platform) at the horizontal position.

3. Disconnect the hydraulic hoses from the cylinder.

⚠ CAUTION

The cylinder will fall if not supported when the rod end pin is removed.

4. Support the cylinder with a crane.

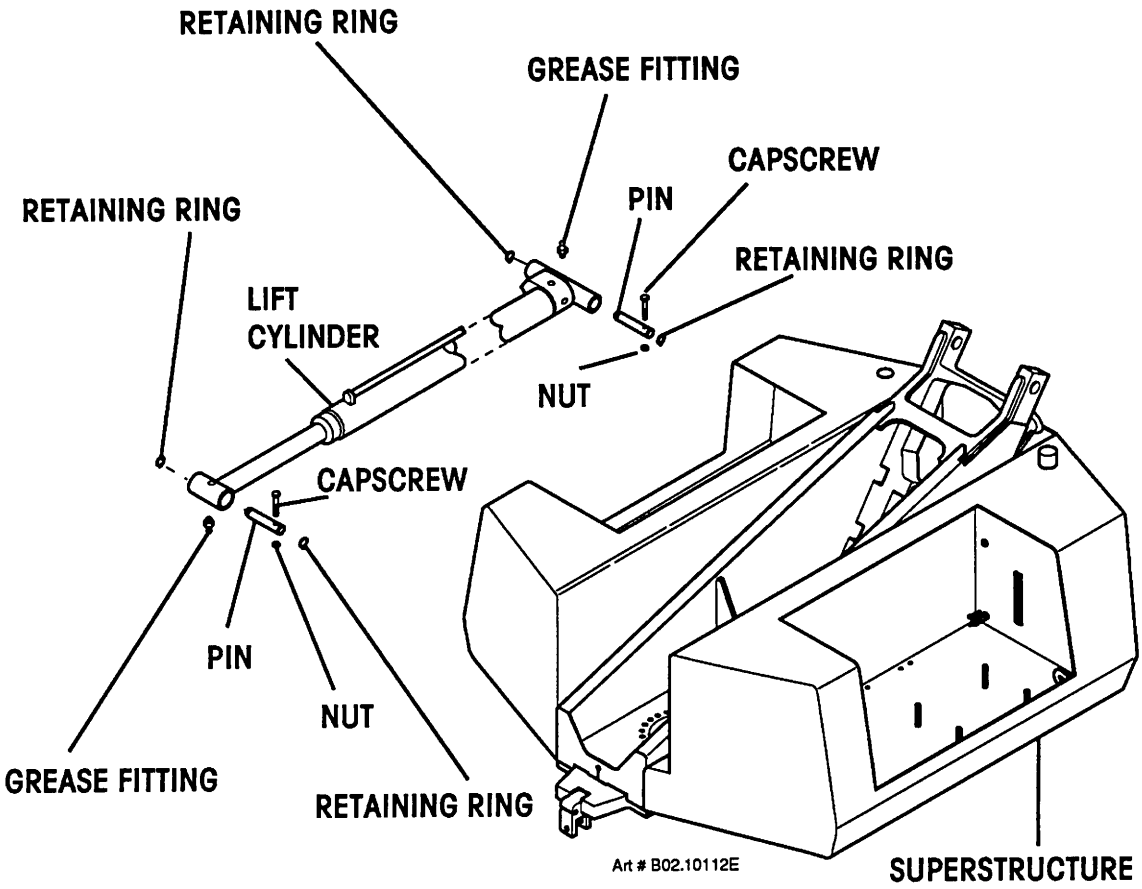
5. Remove the rod end cylinder pin.

6. With the cylinder supported, remove the base end cylinder pin.

7. Move the cylinder to a bench for examination.

8. Extend the cylinder, and examine the protruding rod for score marks and damage.

9. Clean the holding valve and examine for signs of leakage.



Lift Cylinder Pivot Pin.

10. Clean the end of the cylinder.

11. Loosen the end cap, and withdraw it carefully over the piston rod.

⚠ CAUTION

Take care not to damage the rod surface and guard against dirt entering the system.

12. Remove the rod and piston assembly.

NOTE: It is recommended that the backup rings be replaced when seals are changed.

13. Replace the seals and backup rings and reassemble the cylinder; AVOIDING DIRT AND ROD DAMAGE.

14. Tighten the end cap.

15. Install the base end of the cylinder on the machine.

16. Connect all the hydraulic hoses.

17. Extend the lift cylinder and install the rod end to the boom.

18. Remove cylinder support.

19. Remove boom support.

20. BLEED THE SYSTEM after reinstalling the cylinder.

COUNTERBALANCE VALVE INSPECTION

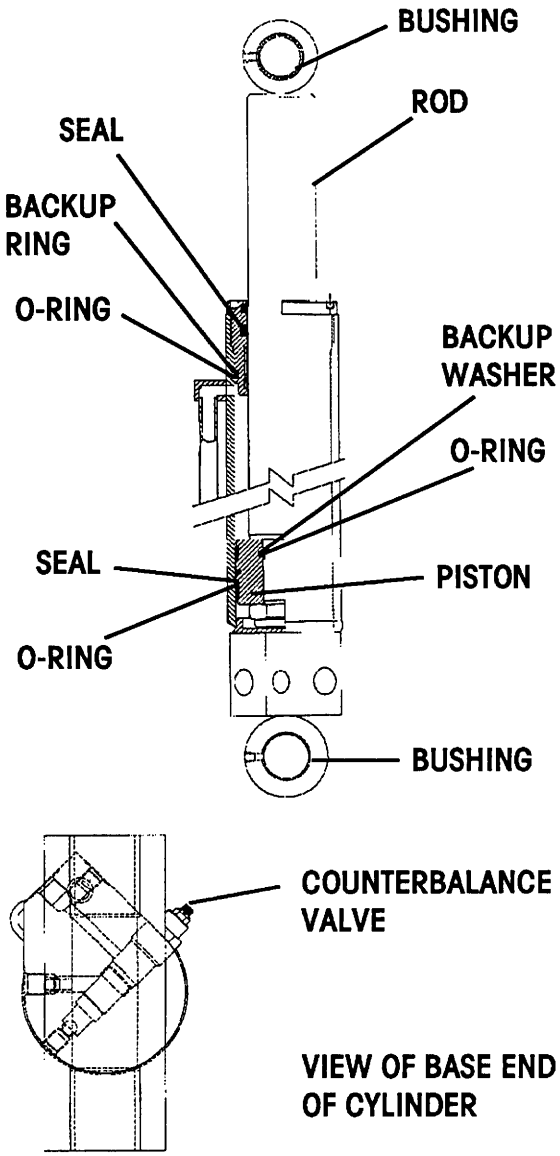
1. Place rated load in platform, raise the boom to the horizontal position, extend the boom to full side reach and stop the engine.

2. If the cylinder subsequently begins to move, the counterbalance valve is faulty and the cartridge should be replaced.

⚠ DANGER

BOOM MUST BE SUPPORTED WHEN CHANGING THE COUNTERBALANCE VALVE. CYLINDER WILL RETRACT WHEN CARTRIDGE IS REMOVED.

NOTE: The counterbalance valve is pre-set at the factory and is not field adjustable.



Lift Cylinder.

BOOM TELESCOPE CYLINDER

The function of the telescope cylinder is to extend and retract the upper boom segment to allow positioning of the work platform. The double acting cylinder must be removed from the machine before a thorough inspection can be accomplished.

TELESCOPE BOOM CYLINDER PIN REPLACEMENT

1. Operate boom lift to horizontal position.

⚠ CAUTION

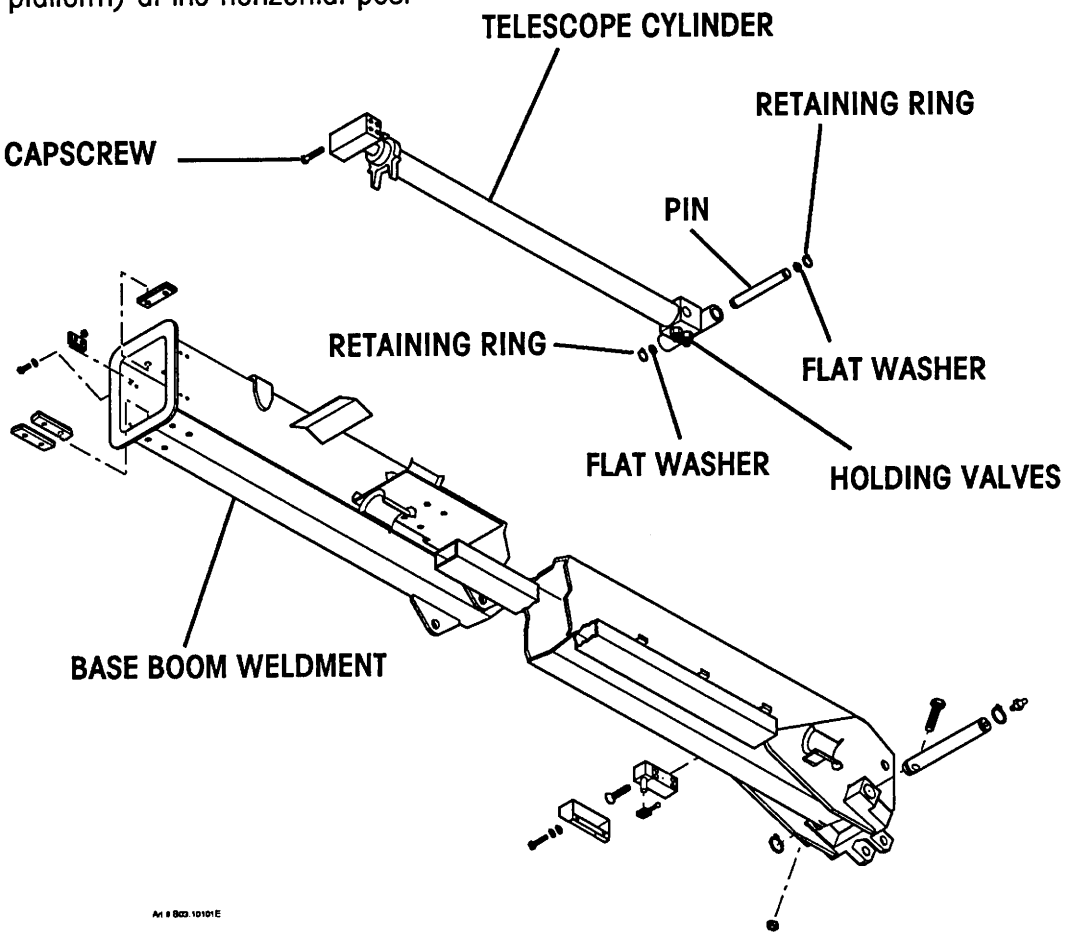
Support the boom any time maintenance is required on the boom or boom cylinders.

2. SUPPORT THE BOOM (on a boom stand or similar rigid platform) at the horizontal position.
3. Remove the retaining ring and flatwasher.

⚠ CAUTION

The cylinder will fall if not supported when the rod end pin is removed.

4. SUPPORT THE CYLINDER and remove the base end pin.
5. Install new pin, flat washers and retaining rings. Cylinder must be lined up for ease of installation.



Telescope Cylinder Replacement.

TELESCOPE CYLINDER REMOVAL

1. Elevate the boom to the horizontal position.

⚠ CAUTION

Support the boom any time maintenance is required on the boom or boom cylinders.

2. Extend the boom until the telescope cylinder rod end mounting capscrews are exposed.
3. SUPPORT THE EXTENDED TIP BOOM (on a boom stand or similar rigid platform).
4. Remove the eight capscrews holding the rod end of the telescope cylinder to the tip boom.
5. Disconnect the hydraulic hoses from the telescope cylinder.
6. Remove the retaining rings, flat washers and pin from the base end of the cylinder.
7. Using a crane, withdraw the cylinder from the boom.

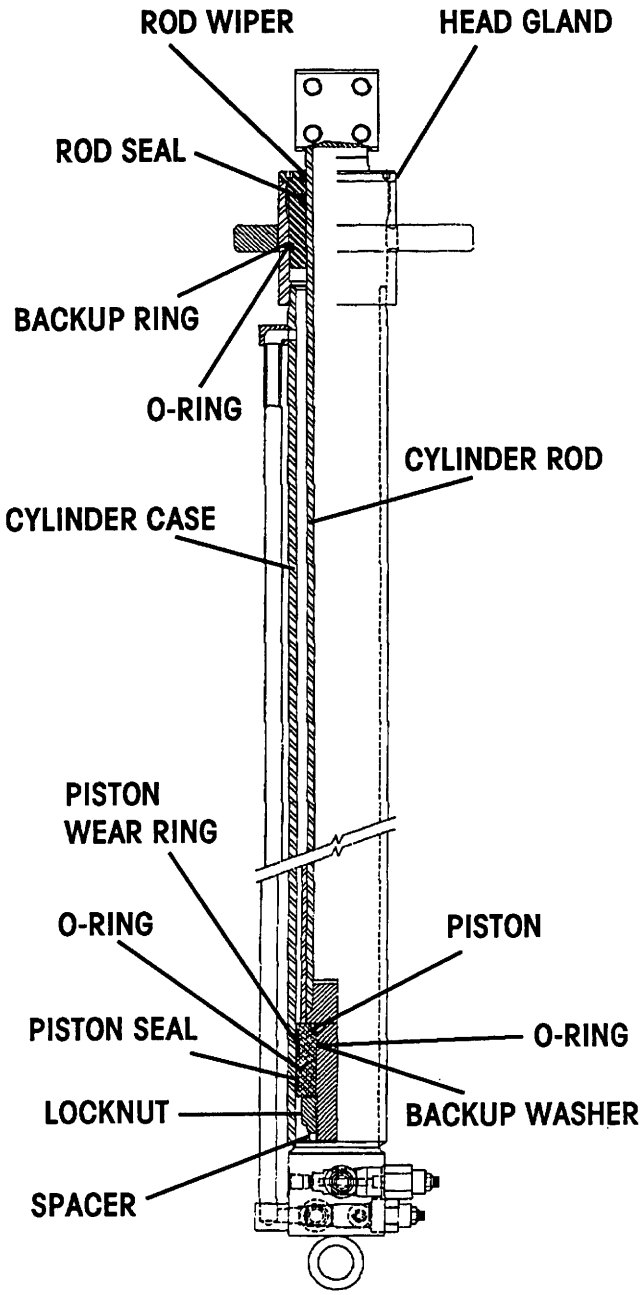
TELESCOPE CYLINDER SEAL REPLACEMENT

1. Remove the end cap from the cylinder.

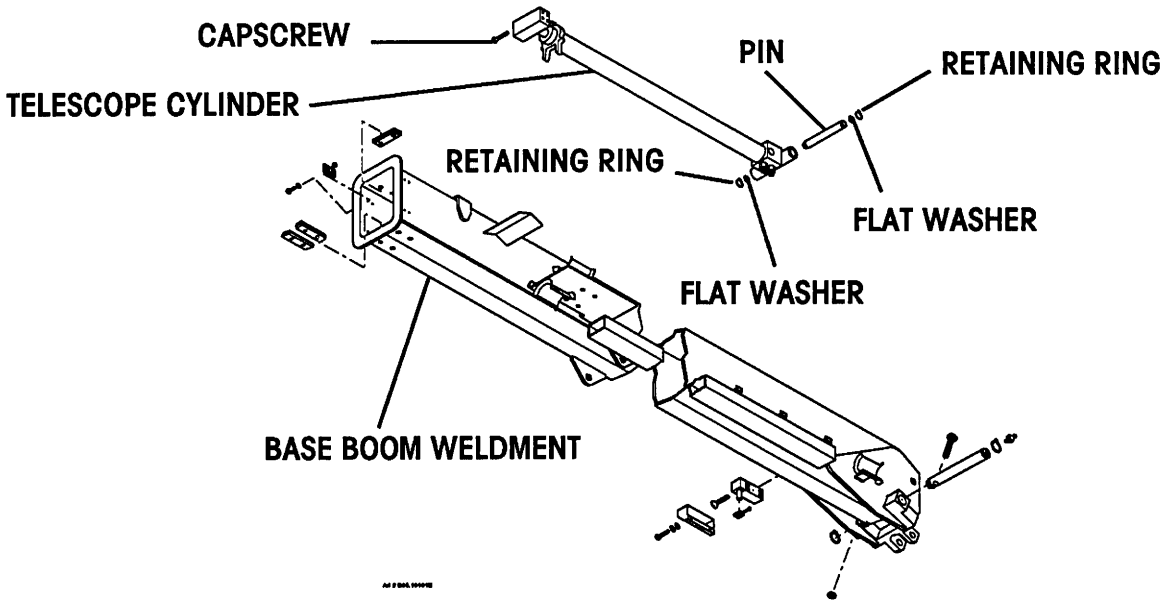
⚠ CAUTION

Take care not to damage the rod surface and guard against dirt entering the system.

2. Pull the cap and rod straight out of the cylinder barrel.
3. Remove the nut from the end of the rod.
4. Slip off the piston.
5. Examine the rod and seals for signs of damage or wear.
6. Remove the old seals and backup rings.
7. Install new seals and backup rings.



Telescope Cylinder.



Telescope (Extend) Cylinder Replacement.

TELESCOPE CYLINDER INSTALLATION

⚠ CAUTION

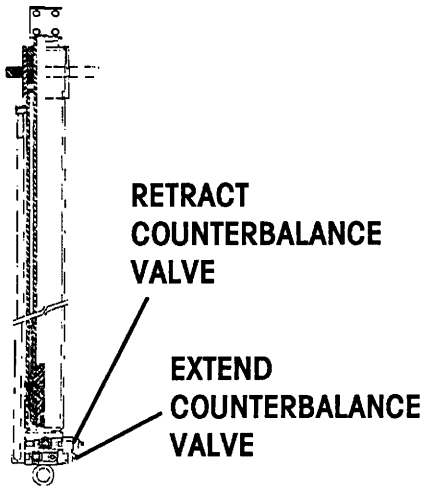
Support the boom any time maintenance is required on the boom or boom cylinders.

1. SUPPORT THE EXTENDED TIP BOOM (on a boom stand or similar rigid platform) IN THE HORIZONTAL POSITION.
2. Using a crane, slide the telescope cylinder into the boom until the rod end mounting holes align with the holes in the tip boom.
3. Install the eight capscrews holding the rod end of the telescope cylinder to the tip boom.
4. Install the pin, flatwashers and retaining rings in the base end of the cylinder.
5. Connect the hydraulic hoses to the telescope cylinder.
6. Cycle the telescope cylinder several times to BLEED THE SYSTEM.

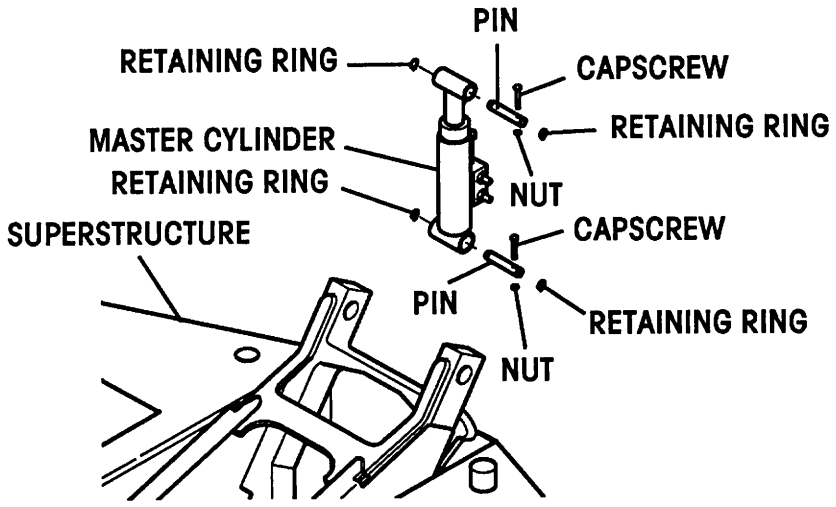
COUNTERBALANCE VALVE INSPECTION

1. Place rated load in the platform, hoist the boom to full elevation and extend the telescope cylinder, then stop the engine.
2. If the telescope cylinder subsequently begins to move, the counterbalance valve is faulty and the cartridge should be replaced.

NOTE: The counterbalance valve is pre-set at the factory and is not adjustable.



Telescope Cylinder.



Master Cylinder Pin Replacement.

PLATFORM LEVEL CYLINDERS

The platform level system automatically keeps the platform level, using a master/ slave cylinder arrangement. As the boom is raised or lowered, fluid is forced from one cylinder to the other in a closed loop, which keeps the platform parallel to the ground in any boom position. The platform level cylinders (master and slave) are of the double acting type.

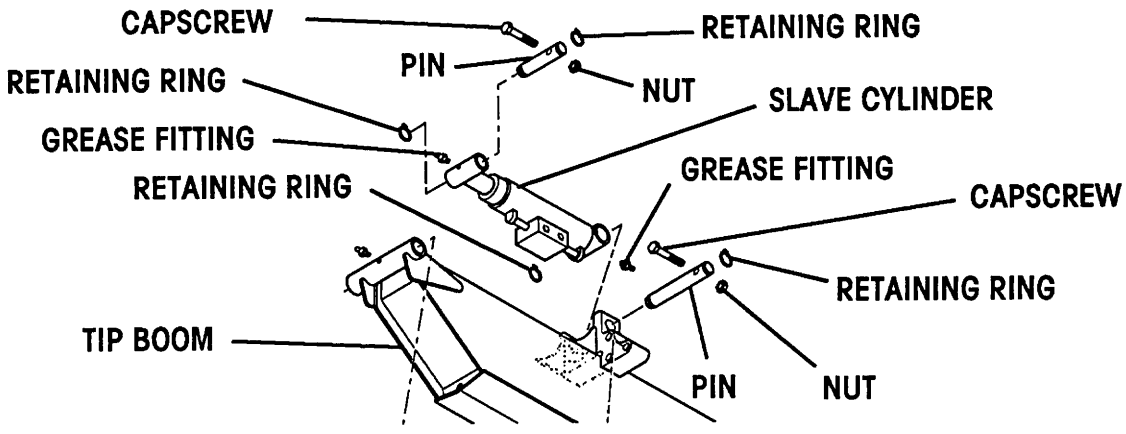
1. Check pivot pins for wear.
2. Check the pivot pin locking bolts for tightness.
3. Inspect the cylinders for fluid leakage, damage and security.
4. Replace the seals when the cylinder is serviced.

PLATFORM LEVEL CYLINDER PIN REPLACEMENT

⚠ CAUTION

Support the platform any time maintenance is required on the level cylinders.

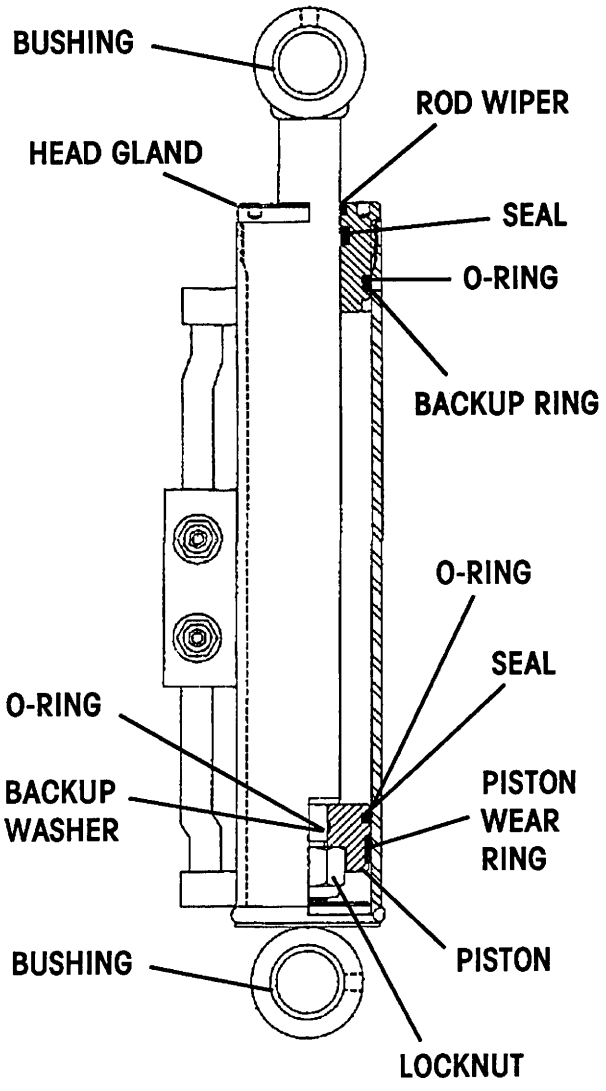
1. SUPPORT THE PLATFORM to remove the load on both master and slave leveling cylinders.
3. Remove the retaining rings, the pin locking capscrew and nut, and remove the pin.
4. Install new pin, locking capscrew, nut and retaining rings.
5. Apply grease to pin through the grease fitting.



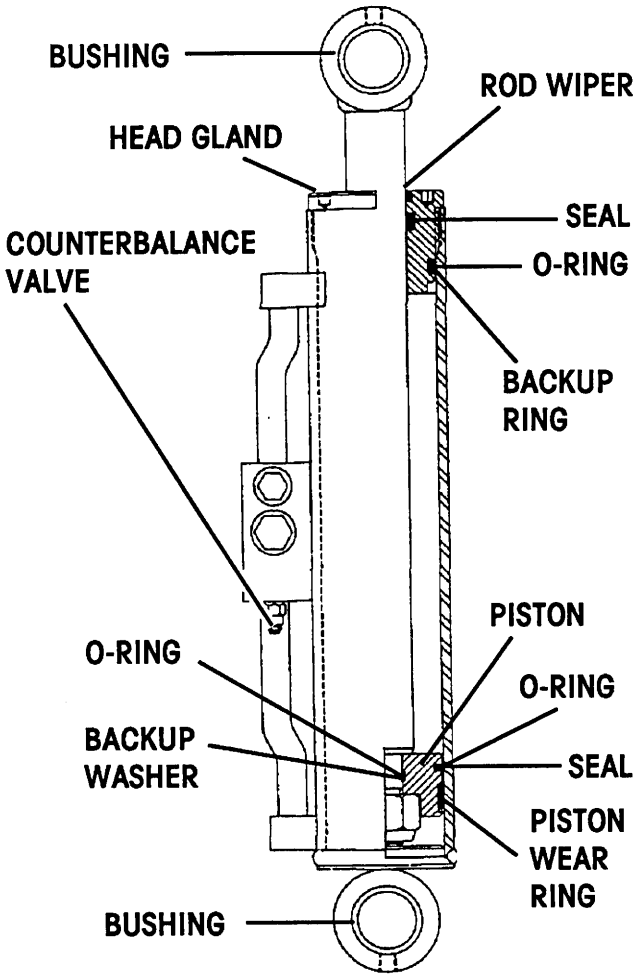
Slave Cylinder Pin Replacement.

LEVEL CYLINDER SEAL REPLACEMENT

1. Lower the boom all the way.
2. SUPPORT THE PLATFORM to remove the load on the slave leveling cylinder.
3. Remove the lock collar and pin. Slave cylinder seals can be replaced on the machine. Master cylinder must be removed for seal replacement.
4. Clean the cylinder.
5. Unscrew the end cap and pull the cap and rod straight out of the cylinder barrel.



Master Level Cylinder.



Slave Level Cylinder.

⚠ CAUTION

Take care not to damage the rod surface, and guard against dirt entering the system.

6. Remove the split pin and nut from the end of the rod.
7. Slip off the piston.
8. Examine the rod and seals for signs of damage or wear.
9. Remove the old seals and install a new seal kit.

BLEEDING THE PLATFORM LEVELING CIRCUIT

After a platform level cylinder has been repaired or replaced, or if the platform does not remain level with the raising and lowering of the boom, the platform leveling circuit may need to be bled.

NOTE: Assistance is required in order to perform the bleeding procedure. One person is needed to operate the platform level control, while the second person bleeds the system.

1. With boom retracted, check the hydraulic fluid level in the tank.

⚠WARNING

HYDRAULIC FLUID WILL BE FORCIBLY EJECTED FROM "B" AND "C" FITTINGS. LOOSEN NIPPLE SLOWLY.

NOTE: The "B" and "C" are marked on the hoses and the fittings are for the hoses marked "B" and "C".

2. Slightly loosen the "B" and "C" hose fittings at the base of the master leveling cylinder.

3. With the platform near ground, operate the platform level control to move the platform fully backward and forward. Perform procedure five (5) times in order to expel any air from the system.

⚠WARNING

CARE MUST BE TAKEN WHEN OPERATING LEVEL CONTROL. AIR IN CYLINDERS CAN CAUSE ERRATIC OR JERKY PLATFORM MOTION.

4. Tighten the "B" and "C" hose fittings and replenish the hydraulic tank.

5. Repeat the procedure as required until all air is expelled.

6. After bleeding the leveling circuit, raise boom to full elevation and then fully lower boom to ensure that platform remains level.

7. Check platform level control lever for proper operation.

SECTION 6:
MAINTENANCE SCHEDULE

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Routine Servicing 6-3
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MAINTENANCE SCHEDULE

The Simon Trailblazer is designed to require a minimum amount of maintenance. However, it is essential that the specified services be performed at the indicated intervals, and that the instructions contained in this manual are followed to ensure safety and reliability.

⚠ DANGER

DEATH OR SERIOUS INJURY MAY RESULT IF MACHINE IS OPERATED IN AN UNSAFE CONDITION. DO NOT OPERATE ANY MACHINE IF IN UNSAFE OPERATING CONDITION.

GENERAL MAINTENANCE TIPS

- ALWAYS clean the surrounding area before opening hydraulic components.
- Never open a hydraulic system when there are contaminants in the air.
- Never leave components or hoses open. They must be protected from contamination (including rain) at all times.
- Use only recommended lubricants (see Lubrication Chart in this manual). Improper lubricants or incompatible lubricants may be as harmful as no lubrication.
- Watch for makeshift "fixes", which can jeapordize safety as well as lead to more costly repairs.
- Any work platform found not to be in safe operating condition should be removed from service until repaired. All repairs should be made by authorized personnel in conformance with the manufacturer's operating, maintenance, and repair manuals.

FIRST THREE MONTHS OF OPERATION

As with any new machine, minor fluid leaks may occur until the various hydraulic components and pipe fittings are fully seated.

It is particularly important that, for the first three months of operation, all hydraulic components, hoses and pipe fittings be checked regularly for leaks and tightness, and corrective action taken as required.

The hydraulic pump, electric motor, cylinders and pressure valves are self-lubricating.

ROUTINE SERVICING

NOTE: The following recommendations are based on advice of our component suppliers, and the requirements of various safety regulations. They should be followed with discretion based on factors such as amount and type of machine usage, environmental conditions, and local safety regulations.

IMPORTANT: Make certain that the unit is inspected per the operational checklists at the end of this section.

DAILY SERVICE

Hydraulic System

Before checking the hydraulic fluid level, ensure that the machine booms are stowed in the traveling position, and the machine is standing on level ground. Fluid level must be to full mark on sight gauge, located on the side of tank. Refer to Lubrication Chart for correct grade of hydraulic fluid.

Ensure that the filler cap is secure to prevent entry of water or other impurities into the tank.

Tire Condition

Check that the tires are in good condition.

Platform Rails and Safety Gate

Check security of platform and safety gate.

Control Valves

Control valves must be checked for correct operation. Check that all control valve handles automatically return to the center (neutral) position.

Steering

Check the steer cylinder for fluid leakage. Inspect steering linkage for signs of wear.

Batteries

Check the electrolyte level in battery cells. Replenish with distilled water, if necessary.

Pivot Pins

Examine all pivot pins on booms and cylinders to ensure that they are positively secured in position.

Test All Machine Systems

Test the operation of the drive assembly, including drive motor and steering.

Test the operation of all machine boom functions.

Checklist

Perform all items on the Daily Checklist found later in this section.

MONTHLY SERVICE

Hydraulic System

Pressurize the hydraulic circuit and inspect the system for any signs of leakage, particularly at flexible hoses, connections and hydraulic components.

Check hydraulic fluid color. If the hydraulic fluid does not appear clear amber, but has a cloudy appearance, it is usually an indication that water is present. A dark brown color, accompanied by a strong "burnt" smell, indicates that the fluid has overheated. If either condition occurs, a complete hydraulic fluid and filter change will be necessary.

The cause of hydraulic fluid deterioration should be investigated and rectified. Have fluid analyzed by a qualified laboratory.

Chassis Bolts

Check all bolts for signs of looseness. Refer to individual items in the monthly checklist.

Cylinders

Check all cylinders for hydraulic fluid leakage.

Pivot Pins and Grease Fittings

Lubricate all pivot pins and grease fittings.

Platform Mounting

Check that platform weldments and platform frame members are in good condition.

Checklist

Perform all items on the Monthly Checklist found later in this section.

SEMI-ANNUAL SERVICE

Boom Cylinders

Fully retract, then extend the boom lift cylinder. At each extreme position, check that there is no movement between cylinder rod and bearing housing, or between cylinder cap and tube.

Fully retract, then extend the boom telescope cylinder. At each extreme position, check that there is no movement of the cylinder pin.

High Pressure Filter

Change the high pressure filter element.

In severe use applications, more frequent filter changes will be necessary.

Checklist

Perform all items on the Semi-Annual Checklist found later in this section.

ANNUAL SERVICE

> **NOTE:** Machine Annual Inspection Report Forms are available from Simon.

Flexible Hoses

Inspect all hoses over their complete length. Replace any hoses showing looseness or corrosion at the end fittings. Replace hoses exhibiting cracking, blistering or excessive wear of outer protective covering.

Hydraulic Fluid

If the hydraulic system has been properly maintained, the fluid should only need to be changed once each year. This, of course, will depend on machine application, amount of use, temperature, atmospheric conditions and other factors.

Hydraulic Fluid Tank

Carefully check the condition of the fluid inside the tank to ensure that it flows easily and is of clear, amber color. In cases of gross contamination, it will be necessary to completely drain and refill the entire hydraulic system.

Place a suitable waste oil container under the drain tap, or attach a suitable hose from the drain tap to the container.

Open the drain tap, and completely drain the fluid from the tank.

Clean or replace the suction hose, and close the drain tap. Refill the tank to the correct level.

Structural Examination

A thorough examination of the machine should be carried out for signs of corrosion, misalignment, material fractures, and other damage. Particular attention should be given to the condition of welded joints.

FOUR YEAR INTERVAL SERVICE

Pivot Pins and Bearings

Remove the pivot pins for examination. Check the pivot pin bearings with the pivot pins removed. Replace with the correct type of pins and bearings, as necessary.

DAILY OPERATIONAL CHECKLIST

All checks must be completed before operation of the unit.

These checklists can be copied as needed to aid in performing these inspections.

DATE: _____ **INSPECTED BY:** _____

MODEL NUMBER: _____ **SERIAL NUMBER:** _____

GENERAL INFORMATION

1. Keep inspection records up-to-date.
2. Record and report all discrepancies to your supervisor.
3. A dirty machine cannot be properly inspected.
   Keep your Simon Trailblazer clean!!



THIS CHECKLIST MUST BE USED AT DAILY INTERVALS OR AFTER EVERY 8 HOURS OF USE, WHICHEVER IS SOONER. FAILURE TO DO SO COULD ENDANGER THE LIFE OF THE OPERATOR. REMEMBER, A LITTLE PREVENTIVE MAINTENANCE CAN SAVE MUCH MORE THAN IT COSTS.

INITIAL	DESCRIPTION
_____	1. Perform a visual inspection of all machine components, i.e. missing parts, torn or loose hoses, hydraulic fluid leaks, torn or disconnected wires, or damaged tires etc. Open both compartment doors to inspect components inside.
_____	2. Check battery electrolyte level and connections. Check fuel, engine oil and coolant levels.
_____	3. Check hydraulic fluid level. The level should be at the line marked on the sight gauge with the unit in stowed position.
_____	4. Check that all shutoff valves on hydraulic tank are open (parallel to flow).

Continued on following page . . .

DAILY OPERATIONAL CHECKLIST (CONTINUED)

INITIAL	DESCRIPTION
_____	5. Check tires for damage.
_____	6. Check tire pressure (see "Machine Specifications").
_____	7. Check wheel lug nuts for tightness.
_____	8. Check hoses for worn areas.
_____	9. Check hose carrier to verify that it is not bent or sagging.
_____	10. Inspect safety belt connections.
_____	11. Check platform rails and gate latch for damage.
_____	12. Check pivot pins for security.
_____	13. Check that all warning and instructional labels are legible and secure.
_____	14. Start engine. Check that hydraulic pressure is as stated on the data plate.
_____	15. Check that the tilt alarm is working properly.
_____	16. Check that no attempt has been made to override the drive interlock system by a previous operator.
_____	17. When all pre-inspection checks have been completed, the operator is ready to test the ground controls for proper operation.
_____	18. Check platform controls for proper operation.
_____	19. With the platform raised, check for the smooth operation of low speed drive.
_____	20. Follow engine daily service requirements. Refer to the Engine Maintenance Manual supplied with your Trailblazer.

Continued on following page . . .

DAILY OPERATIONAL CHECKLIST (CONTINUED)

ADDITIONAL MAINTENANCE REQUIREMENTS FOR HARSH ENVIRONMENTS

NOTE: Do not grease boom slide pads in dusty or sandblast environments. There are boom seals and covers available to extend the life of these items in severe applications. Consult Simon Aerials Service Department.

DAILY

INITIAL	DESCRIPTION
_____	21. Inspect cylinder boots, valve spool boots, etc., for cuts or other damage after every eight (8) hours of service. Repair or replace if necessary.
_____	22. Check hydraulic system for leakage after every eight (8) hours of operation.
_____	23. Follow engine severe usage service requirements. Refer to the Engine Maintenance Manual supplied with your Trailblazer.

WEEKLY

INITIAL	DESCRIPTION
_____	24. Inspect condition of hydraulic fluid in the reservoir. Fluid should have a clear amber color.
_____	25. Lubricate all grease fittings (see Lubrication Chart).
_____	26. Wash and lubricate hose track chain.

MONTHLY OPERATIONAL CHECKLIST

DATE: _____ **INSPECTED BY:** _____

MODEL NUMBER: _____ **SERIAL NUMBER:** _____

These checklists can be copied as needed to aid in performing these inspections.

GENERAL INFORMATION

1. Keep inspection records up-to-date.
2. Record and report all discrepancies to your supervisor.
3. A dirty machine cannot be properly inspected.
   Keep your Simon Trailblazer clean!!

⚠ WARNING!!!

THIS CHECKLIST MUST BE USED AT MONTHLY INTERVALS OR EVERY 100 HOURS OF OPERATION, WHICHEVER OCCURS FIRST. FAILURE TO DO SO COULD ENDANGER THE LIFE OF THE OPERATOR. ALWAYS REMEMBER, A LITTLE PREVENTIVE MAINTENANCE CAN SAVE MUCH MORE THAN IT COSTS.

INITIAL	DESCRIPTION
_____	1. Perform all checks listed on Daily Operational Checklist.
_____	2. Lubricate all grease fittings (see Lubrication Chart).
_____	3. Inspect condition of hydraulic fluid in the reservoir. Fluid should have a clear amber color.
_____	4. Check hydraulic system for leaks, examine hoses for signs of excessive wear, chafing or twisting. Adjust the hoses and/ or replace them if necessary.
_____	5. Inspect the work platform and boom structure for signs of damage and broken welds. Check all bolts (including cab rotate bolts) for tightness.
_____	6. Check for unit damage, broken welds, loose bolts, improper or make-shift repairs.
_____	7. Check protective rubber cover around hoses at moving anchor, tip boom, boom hose passages, and at swing bearing.

Continued on following page . . .

MONTHLY OPERATIONAL CHECKLIST

INITIAL	DESCRIPTION
_____	8. Check torque of swing bearing bolts (see "Machine Specifications").
_____	9. Check torque of swing drive mounting bolts (see "Machine Specifications").
_____	10. Check that wheels are not leaning in or out.
_____	11. Check that steer wheel spindles turn freely, with no end play. Refer to Lubrication Chart.
_____	12. Check torque of axle mounting bolts (see "Machine Specifications").
_____	13. Check wheel lug nut torque (see "Machine Specifications").
_____	14. Check that the boom does not drift down with a full load, no hydraulic pressure (engine off).
_____	15. Check to make sure boom sections are not dented or bent.
_____	16. Check that all jam nuts on adjustable flow valves are locked. Check settings if any are not locked.
_____	17. Check fuel shutoff rack for proper operation. Loosen lever arm and lubricate with WD-40 or equivalent.
_____	18. Follow engine monthly service requirements. Refer to the Engine Maintenance Manual supplied with your Trailblazer.
_____	19. Check axle and planetary ends. Refer to Lubrication Chart.
_____	20. Check swing bearing and swing bearing teeth. Refer to Lubrication Chart.
_____	21. Spray all manual hydraulic valve spool linkages with WD-40.

ADDITIONAL MAINTENANCE REQUIREMENTS FOR SEVERE USAGE APPLICATIONS

EVERY 90 DAYS

INITIAL	DESCRIPTION
_____	22. Replace high pressure filter element.

SEMI-ANNUAL OPERATIONAL CHECKLIST

DATE: _____ **INSPECTED BY:** _____

MODEL NUMBER: _____ **SERIAL NUMBER:** _____

These checklists can be copied as needed to aid in performing these inspections.

GENERAL INFORMATION

1. Keep inspection records up-to-date.
2. Record and report all discrepancies to your supervisor.
3. A dirty machine cannot be properly inspected.
   Keep your Simon Trailblazer clean!!



THIS CHECKLIST MUST BE USED AT SIX MONTH INTERVALS OR EVERY 500 HOURS OF OPERATION, WHICHEVER OCCURS FIRST. FAILURE TO DO SO COULD ENDANGER THE LIFE OF THE OPERATOR. ALWAYS REMEMBER, A LITTLE PREVENTIVE MAINTENANCE CAN SAVE MUCH MORE THAN IT COSTS.

INITIAL	DESCRIPTION
_____	1. Perform all checks listed on Daily and Monthly Operational Checklists.
_____	2. Have hydraulic fluid sample analyzed at a test laboratory. Comply with test results and recommendations to ensure long, trouble free operation. **NOTE:** If hydraulic fluid has been regularly maintained, it should only require changing once every year, depending on maintenance, temperature, application, duty cycle, and atmospheric conditions.
_____	3. Clean and lubricate all electrical switches with an electrical contact cleaner and ensure that the switches operate freely in all positions.
_____	4. Check the electrical mounting and hardware connections for security.
_____	5. Replace high pressure filter elements.

Continued on following page . . .

SEMI-ANNUAL OPERATIONAL CHECKLIST (CONTINUED)

INITIAL	DESCRIPTION
_____	6. Follow engine semi-annual service requirements. Refer to the Engine Maintenance Manual supplied with your Trailblazer.

SECTION 7:
TROUBLESHOOTING

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GENERAL TROUBLESHOOTING TIPS

Before investigating a malfunction, check the following items:

- The Main Power Key Switch should be in the "GROUND" or "PLATFORM" position.
- The Foot Pedal Switch is pressed and held for platform console operation.
- Pump Selector Switch is pressed and held for ground control operation.
- Check that battery connections are secure and battery is fully charged.
- Check that the Emergency Stop Button(s) are released.
- Check that the hydraulic reservoir ball valves are open.
- Check that hydraulic fluid is at the correct level.

Common Causes of Hydraulic System Malfunctions:

- Mixing incompatible hydraulic fluids, destroying the additives and causing varnish build up resulting in sticking valves.
- Water in the hydraulic fluid due to a damp climate and loss of reservoir pressurization.
- Improper viscosity hydraulic fluid; too high in a cold climate, too low in a warm climate.

  NOTE: Mobil DTE-15 is recommended as a general purpose fluid suitable for all but the most extreme environmental conditions.

- Fuel in the hydraulic fluid, which lowers the viscosity and lubricity of the fluid.

TROUBLESHOOTING CHART

Problem	Probable Cause	Solution
• Excessive heat causing excessive wear on seals and metal parts due to lowered hydraulic fluid viscosity. Symptoms to watch for are: pump case turns brown, hydraulic fluid darkens and premature pump failure.	• Excessive water in the hydraulic fluid.	• Drain, flush and refill hydraulic system.
	• Improper oil viscosity.	• Drain, flush and refill hydraulic system with the correct fluid.
	• Improper lubrication and hydraulic fluid.	• Drain and flush hydraulic system.
	• Pump cam bearing failure.	• Rebuild pump as required.
	• Foot pedal blocked to the "ON" position.	• Unblock foot pedal.
• Water in hydraulic fluid. Symptoms to watch for are: pitting and etching of pump pistons and pump piston cam wear causing heat build up and premature pump failure.	• Damp climate.	• Drain and flush hydraulic system.
	• Hydraulic fitting or port open to contaminants.	• Drain and flush hydraulic system. Replace worn pump components.
	• Reservoir not pressurized.	• Check pressure. Check reservoir for leaks.
• Varnish, the dark brownish residue left from oxidation of hydraulic fluids. Symptoms to watch for are: pistons, spools and moving parts with close tolerances tend to stick and hang up.	• Mixing of incompatible fluids or poor quality fluids.	• Drain and flush hydraulic system, then fill with recommended hydraulic fluid.
	• Excessive heating of the fluids.	• Drain and flush hydraulic system, then fill with recommended hydraulic fluid.
• Poor lubrication, parts break through lubricant causing metal to metal contact. Symptoms to watch for are: heads of pump pistons worn and excessive heat build up.	• Hydraulic fluid viscosity low.	• Drain and flush hydraulic system, then fill with recommended hydraulic fluid.
	• Improper or poor grade hydraulic fluid or lubricant without anti-wear additives.	• Drain and flush hydraulic system, then fill with recommended hydraulic fluid.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Cavitation, a gaseous condition within the fluid stream where the pressure is reduced to the vapor pressure of the fluid. The higher the system pressure the more violent the reaction will be. Symptoms to watch for are: pitting and etching of pump pistons.	• Low reservoir fluid level.	• Add hydraulic fluid.
	• Air leaks in suction line.	• Repair any suction hose leaks.
	• Improper hydraulic fluid.	• Have fluid analyzed regularly and drain and flush hydraulic system, then fill with recommended hydraulic fluid.
	• Vaporization of water.	• Have fluid analyzed regularly and drain and flush hydraulic system, then fill with recommended hydraulic fluid.
	• Hydraulic fluid system has not been warmed before using full system pressure.	• Warm up system before using full system pressure.
	• Pump speed too high.	• Ensure reservoir pressurization is operating properly and adjust engine speed.
• Boom track cross braces breaking.	• Hoses skiving in the boom trac.	• Check hydraulic pressure and adjust if necessary.
	• System pressure too high, causing boom hoses to shrink more than normal.	• Check hydraulic pressure and adjust if necessary.
	• Hoses too tight in the track.	• Adjust hose tension.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Boom track sagging.	• Track pin holes stretched usually caused by a damaged "I" beam support. • Overhead guard is damaged. If the guard is damaged, the track could get caught and could also tear off the moving anchor. • Improper lubrication and cleaning.	• Check "I" beam support and replace if necessary. • Replace overhead guard and any other items damaged due to a damaged guard. • Follow proper lubrication and cleaning procedures.
• Engine won't crank.	• Starter motor relay. • Starter motor interlock relay. • Low oil pressure/ high water temperature. • Power relay. • Ground/ platform switch. • Ground/ platform ignition switch. • Oil pressure relay. • Engine failure.	• A breakdown in any one of these components will cause the engine not to crank. Trace the available voltage to starter motor relay. Replace the faulty component(s).
• Throttle actuator doesn't work.	• Throttle high speed relay. • Circuit breaker is bad. • An actuator failure.	• A breakdown in any one of these components will cause the actuator not to function. Trace the available voltage to the throttle solenoid. Replace the faulty component(s).

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Movement alarm will not sound.	• Broken wire or connection in the horn circuit. • Horn is faulty.	• Trace the available voltage to the horn. • A breakdown in any one of these components will cause the alarm not to function. Replace the faulty component(s).
• Lift cylinder drifts down.	• Counterbalance valve cartridge dirty or faulty. • Cylinder packing is damaged.	• Clean, repair or replace the counterbalance valve. • Replace cylinder packing.
• No hydraulic pump output	• Water in hydraulic fluid. • Improper oil viscosity. • Foot pedal blocked. • Hydraulic fittings loose or ports open. • Pump cam bearing failure. • Broken pump drive shaft. • Compensator valve malfunction. • Fluid leaks.	• Drain and flush hydraulic system. • Use correct fluid. See Lubrication Chart. • Unblock foot pedal. • Close ports and tighten fittings. Drain and flush hydraulic system. • Replace pump. • Check for broken pump drive shaft and replace if broken. • Check for improper compensator adjustment and correct adjustment or replace valve. • Check for circuit leakage and fluid at pump inlet.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Low hydraulic pump output.	• Low pressure. • Component failure.	• Check and adjust for correct pressure if necessary. • Check for compensator valve, seat, spring or packing failure and replace if damaged. • Check for worn or scored pistons and bores; replace if damaged. • Check for broken discharge valve or spring; replace if damaged. • Check for restricted inlet or insufficient inlet fluid.
• Hydraulic functions slow.	• Low hydraulic pump pressure. • Hydraulic high pressure filter. • Pump component failure.	• Check and adjust for correct pressure if necessary. • Check for plugged hydraulic high pressure filter; replace filter element. • Check for compensator valve, seat, spring or packing failure and replace if damaged.
• Slow hydraulic pump response.	• High pressure filter.	• Check for plugged high pressure filter.
• Excessive hydraulic pump pressure.	• Improper compensator adjustment.	• Adjust compensator valve and replace if necessary.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Function chatter.	• Hydraulic fluid low.	• Check for sufficient inlet fluid and add fluid.
	• Hydraulic tank not pressurized.	• Check hydraulic tank cap.
	• Broken pump components.	• Check for sticking pump pistons; replace if necessary. • Check for broken discharge valve or spring; replace if necessary. • Check for broken inlet valve; replace if necessary. • Check for charge system leakage. • Check for pump suction air leak.
• Hydraulic pump and fluid line vibration.	• Component failure.	• Check for broken discharge valve or spring; replace if damaged. • Check for leaking or broken inlet valve; replace if damaged.
• Hydraulic pump shaft seal failure.	• High pressure.	• Check for overpressurized seal drain line; reduce pressure and replace seal.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Hydraulic pump noise or squeal.	• Low pressure. • Component failure.	• Check for low deadhead pressure and adjust for correct pressure. • Check for compensator valve, seat, spring or packing failure and replace if damaged. • Check for leaking inlet valve; replace if damaged. • Check for air leak at inlet connections. • Check for insufficient inlet fluid (cavitation).
• All hydraulic functions inoperable.	• Low fluid in reservoir. • Hydraulic pump compensator out of adjustment. • Hydraulic pump defective.	• Fill to proper level. • Adjust or repair • Repair or replace.
• Telescope, swing, or lift functions don't operate using ground control.	• Pendant toggle switches have no voltage. • Valve is stuck. • Defective counterbalance valve.	• Check voltage available to the toggle switches. • Manually engage valve spool. • Check counterbalance valve for foreign material or internal damage; replace if damaged.
• Boom drifts down without lever actuated with power on or off.	• Defective counterbalance valve.	• Check counterbalance valve for foreign material or internal damage; replace if damaged.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Boom drifts down without lever activation but with power on; does not drift down with power off.	• Mechanical failure.	• Check that ground and platform boom control levers return to their neutral position.
• Drive function does not operate from ground.	• No voltage at toggle switch. • Ground drive speed control relay is bad.	• Check voltage available to the toggle switches. • Ensure proper operation of ground drive speed control relay or replace.
• No steer function from ground.	• Steer toggle switch is bad. • Steer valve. • Faulty steer cylinder.	• Check voltage available to the toggle switch. • Steer valve is not fully engaged. • Possibly plugged steer ports or damaged cylinder packing. Inspect, repair or replace steer cylinder.
• No drive function from platform.	• Platform low speed drive control relay is bad. • No hydraulic fluid flow available to the drive motors. • Diverter valve not fully shifted. • Drive motors are damaged. • Drive valve spool is stuck. • Low speed flow controls are closed.	• Ensure platform drive speed control relay is working properly. Repair or replace. • Test for available fluid flow at the drive motors. • Inspect, repair or replace. • Inspect, repair or replace. • Manually engage and check for proper operation. Replace if faulty. • Adjust for proper speed.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• No lift function from platform.	• Mechanical failure.	• Check that ground and platform boom control levers return to their neutral position.
	• Lift spool valve stuck.	• Manually engage lift (hoist) spool and check for operation.
	• Defective counterbalance valve.	• Check counterbalance valve for foreign material or internal damage; replace if damaged.
	• Faulty cylinder.	• Plugged lines, cylinder ports or damaged cylinder packings. Inspect, repair or replace cylinder.
	• Pump not coming on stroke.	• Check pump stroke circuit.
	• Drive enable valve energized.	• Check drive enable valve for voltage/ open cartridge.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• No extend or retract function from platform.	• Spool valve stuck.	• Manually engage spool and check for proper operation. Replace if faulty.
	• Mechanical failure.	• Check that ground and platform boom control levers return to neutral position.
	• Pressure reducing valve possibly leaking to tank.	• Inspect, clean and retest. Replace if faulty.
	• Defective counterbalance valve.	• Check counterbalance valve for foreign material or internal damage; replace if damaged.
	• High pressure filter dirty.	• Check for a dirty high pressure filter; replace filter element if dirty.
	• Drive enable valve energized.	•Check drive enable valve for voltage/ open cartridge.
• No swing function from platform.	• Spool valve stuck.	• Manually engage swing spool and check for proper operation. Replace if faulty.
	• Drive enable valve energized.	•Check drive enable valve for voltage/ open cartridge.
• Swing motor will not run in either direction.	• Mechanical malfunction.	• Check for an obstruction between the pinion gear and swing bearing; remove the obstruction.
		• Swing gearbox pinion shaft is broken; replace pinion shaft.
		• Swing motor shaft is broken or seized; replace the swing motor.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Swing gear pinion shaft, tooth and/ or ring bearing failure.	• Excessive side loading of boom.	• Check for excessive side loading of boom; correct the situation and replace rotation bearing if teeth damaged.
	• Unit throttling not being used, causing instant on and off of the swing motor.	• Check that the foot pedal is depressed before the lever is activated.
	• Swing pinion gear torqued too tight.	• Check for correct torque; adjust the torque.
• Platform will not react to platform rotate control movement.	• Double pilot operated check valve (relief valve).	• Install valve correctly. Check the valve cartridge and replace if necessary.
	• Valve spool leakage.	• Check for internal leakage of the valve spool; replace.
	• Mechanical malfunction.	• If platform rotates only in one direction, check for physical constraints or foreign material restricting platform rotation; remove foreign material.
• Platform rotate selector valve body cracked or blown body seal.	• Excessive system pressure.	• Check that there is no back pressure on the return port. Check that inlet and return hoses are connected.
	• Blocked hoses.	• Check for blocked or partially blocked return hoses.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Platform does not level properly (platform drifting).	• Damaged parts.	• Check for damaged parts such as bent pins or elongated pin holes; replace damaged parts. May need to replace slave cylinder.
	• Defective counterbalance valve.	• Check counterbalance valve for foreign material or internal damage; replace if damaged.
	• Defective double pilot operated check valve.	• Repair or replace as necessary.
• Platform level selector valve body cracked or blown body seal.	• Excessive system pressure.	• Check that there is no back pressure on the return port. Check that inlet and return hoses are connected.
	• Blocked hoses.	• Check for blocked or partially blocked return hoses.
• Unit will not steer; all other functions operate.	• Steer cylinder may not be mechanically connected to steering linkage.	• Check for disconnected, binding or damaged steering linkage; connect or replace steering linkage as necessary.
	• Steering directional control valve.	• The steering directional control valve may not be shifting. The valve spools may be stuck. The directional control valve maybe defective or a valve spool obstructed. Remove valve and inspect, clean, repair or replace as needed.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Steer selector valve body cracked or blown body seal.	• Excessive system pressure.	• Check that there is no back pressure on the return port. Check that inlet and return hoses are connected.
	• Blocked hoses.	• Check for blocked or partially blocked return hoses.
• Wheel drive motor failure.	• Contaminated hydraulic fluid.	• Check for contamination of hydraulic fluid; drain, flush system and replace with the correct grade of hydraulic fluid.
	• Wheel drive motor component failure.	• Replace the motor. If one motor failed, internal loose or broken pieces will eventually flow into the opposite motor causing that motor to fail; unless lines are properly cleaned. Drain, flush system and replace hydraulic fluid after replacing broken component.
	• Wheel bearing failure.	• Check for proper installation of wheel bearing.
	• Machine has been towed with drive motor engaged.	• Do not tow the machine if not equipped with the tow package.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Low speed drive valve inoperative in low speed drive mode only.	• Valve spool stuck.	• Check for a sticking spool; replace if necessary.
	• High speed drive valve coil.	• Check resistance in the high speed drive valve coil. Each coil should have 4 ohms resistance, if valve has less than 4 ohms resistance, excessive voltage will feed across the coil to the opposite coil of the low speed valve trying to be operated. Thus both coils are trying to actuate. Replace high speed drive coil if necessary.
	• Flow controls closed or plugged.	• Clean or replace flow control valve.
• Unit will not go into high speed drive with boom retracted and lowered.	• High pressure filter dirty.	• Replace filter element.
	• Hi speed drive valve faulty.	• Repair or replace if necessary.
	• Boom limit switches faulty.	• Check wiring or replace switches.

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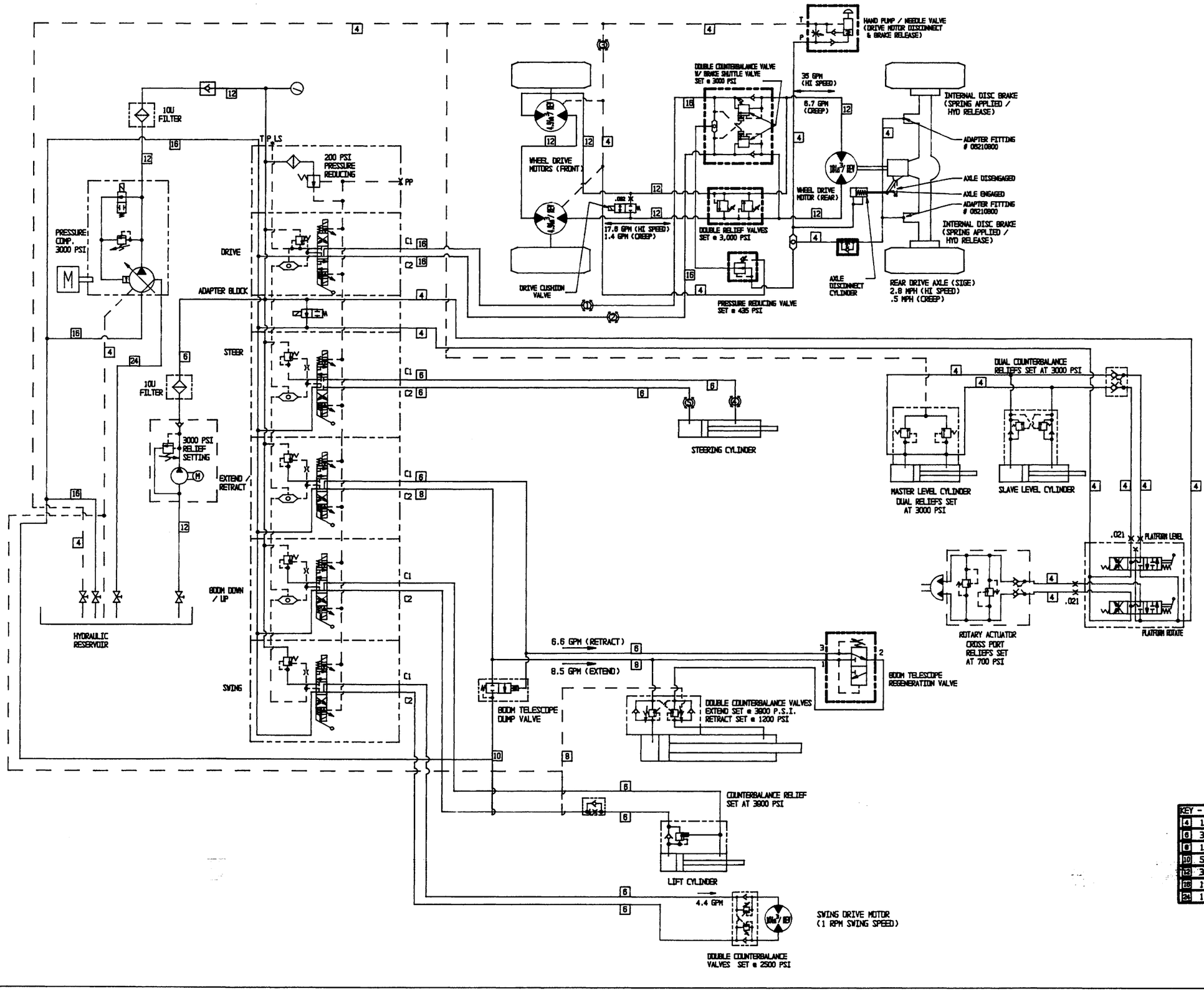
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- Wisconsin 35 HP (Gas and Dual Fuel) B-2370510



KEY - LINE SIZES	
4	1/4" ID HOSE
6	3/8" ID HOSE
8	1/2" ID HOSE
10	5/8" ID HOSE
12	3/4" ID HOSE
16	1" ID HOSE
24	1 1/2" ID HOSE

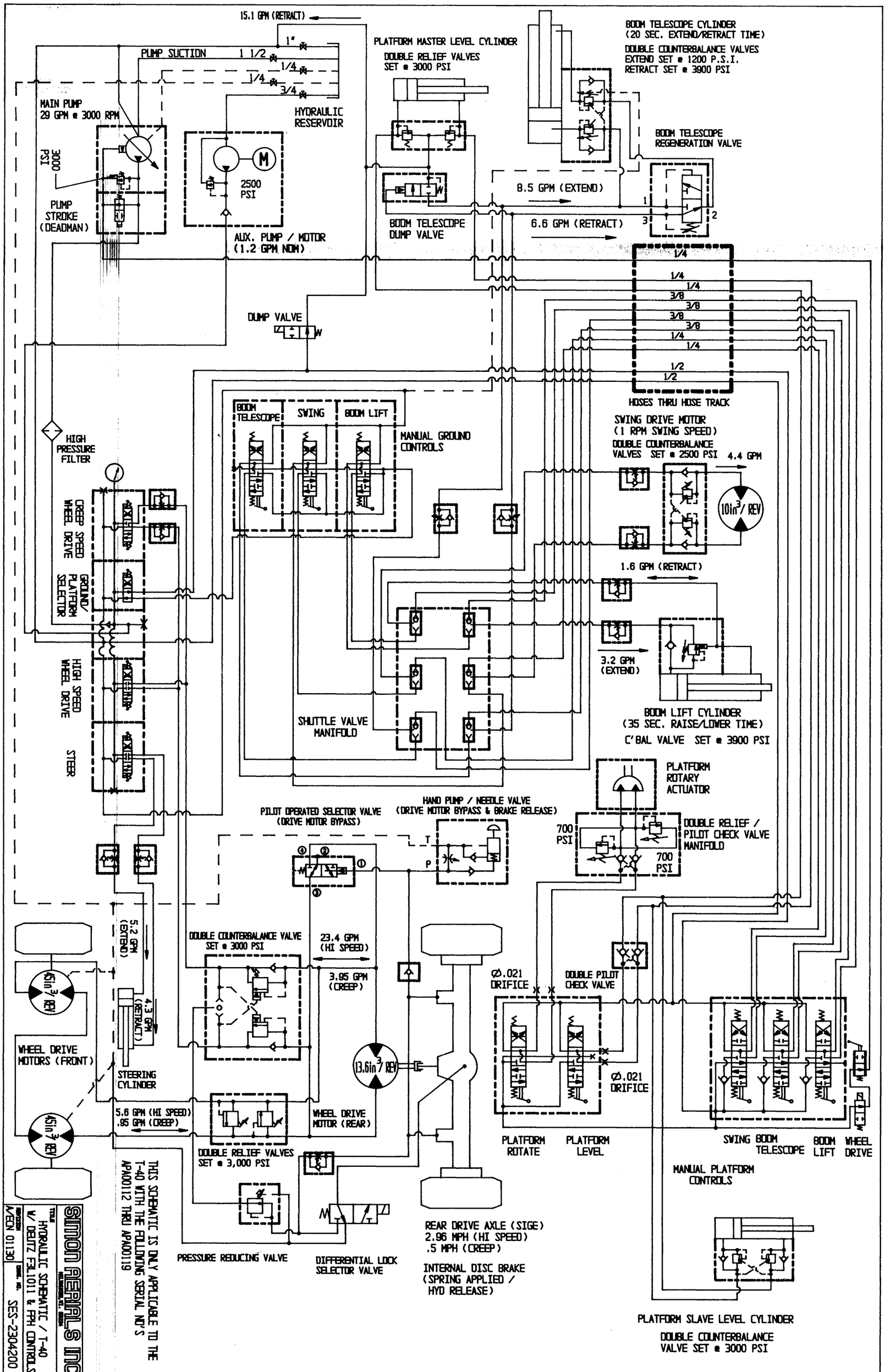
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SIMON AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: HYDRAULIC SCHEMATIC

REVISION: *

DRWG. NO. SES 2360730


15.1 GPM (RETRACT)
PUMP SUCTION
1"
1 1/2
1/4
1/4
3/4
HYDRAULIC RESERVOIR
MAIN PUMP
29 GPM @ 3000 RPM
3000 PSI
PUMP STROKE (DEADMAN)
2500 PSI
AUX. PUMP / MOTOR (1.2 GPM NOM)
PLATFORM MASTER LEVEL CYLINDER
DOUBLE RELIEF VALVES SET @ 3000 PSI
BOOM TELESCOPE DUMP VALVE
BOOM TELESCOPE CYLINDER (20 SEC. EXTEND/RETRACT TIME)
DOUBLE COUNTERBALANCE VALVES EXTEND SET @ 1200 P.S.I. RETRACT SET @ 3900 PSI
BOOM TELESCOPE REGENERATION VALVE
8.5 GPM (EXTEND)
6.6 GPM (RETRACT)
DUMP VALVE
HOSES THRU HOSE TRACK
BOOM TELESCOPE
SWING
BOOM LIFT
MANUAL GROUND CONTROLS
HIGH PRESSURE FILTER
SWING DRIVE MOTOR (1 RPM SWING SPEED)
DOUBLE COUNTERBALANCE VALVES SET @ 2500 PSI
4.4 GPM
10in³/REV
1.6 GPM (RETRACT)
3.2 GPM (EXTEND)
BOOM LIFT CYLINDER (35 SEC. RAISE/LOWER TIME)
C'BAL VALVE SET @ 3900 PSI
CREEP SPEED WHEEL DRIVE
GROUND/ PLATFORM SELECTOR
HIGH SPEED WHEEL DRIVE
STEER
SHUTTLE VALVE MANIFOLD
PLATFORM ROTARY ACTUATOR
PILOT OPERATED SELECTOR VALVE (DRIVE MOTOR BYPASS)
HAND PUMP / NEEDLE VALVE (DRIVE MOTOR BYPASS & BRAKE RELEASE)
700 PSI
DOUBLE RELIEF / PILOT CHECK VALVE MANIFOLD
700 PSI
5.2 GPM (EXTEND)
DOUBLE COUNTERBALANCE VALVE SET @ 3000 PSI
23.4 GPM (HI SPEED)
3.95 GPM (CREEP)
45in³/REV
4.3 GPM (RETRACT)
WHEEL DRIVE MOTORS (FRONT)
STEERING CYLINDER
13.6in³/REV
Ø.021 ORIFICE
DOUBLE PILOT CHECK VALVE
Ø.021 ORIFICE
5.6 GPM (HI SPEED)
.95 GPM (CREEP)
WHEEL DRIVE MOTOR (REAR)
DOUBLE RELIEF VALVES SET @ 3,000 PSI
PLATFORM ROTATE
PLATFORM LEVEL
SWING
BOOM TELESCOPE
BOOM LIFT
WHEEL DRIVE
MANUAL PLATFORM CONTROLS
REAR DRIVE AXLE (SIGE)
2.96 MPH (HI SPEED)
.5 MPH (CREEP)
INTERNAL DISC BRAKE (SPRING APPLIED / HYD RELEASE)
PRESSURE REDUCING VALVE
DIFFERENTIAL LOCK SELECTOR VALVE
PLATFORM SLAVE LEVEL CYLINDER
DOUBLE COUNTERBALANCE VALVE SET @ 3000 PSI
THIS SCHEMATIC IS ONLY APPLICABLE TO THE T-40 WITH THE FOLLOWING SERIAL NO'S
APA00112 THRU APA00119
SIMON AERIALS INC.
HYDRAULIC SCHEMATIC / T-40 W/ DEUTZ F3L1011 & FPH CONTROLS
MODEL NO. SES-2304200
MODEL YEAR 01130

15.1 GPM (RETRACT)
1"
PUMP SUCTION
1 1/2
1/4
3/4
MAIN PUMP
29 GPM @ 3000 RPM
HYDRAULIC RESERVOIR
PLATFORM MASTER LEVEL CYLINDER
DOUBLE RELIEF VALVES SET @ 3000 PSI
BOOM TELESCOPE CYLINDER
(20 SEC. EXTEND/RETRACT TIME)
DOUBLE COUNTERBALANCE VALVES
EXTEND SET @ 3900 P.S.I.
RETRACT SET @ 1200 PSI
BOOM TELESCOPE
REGENERATION VALVE
8.5 GPM (EXTEND)
6.6 GPM (RETRACT)
PUMP STROKE (DEADMAN)
2500 PSI
EMERGENCY PUMP / MOTOR
(1.2 GPM NOM.)
BOOM TELESCOPE DUMP VALVE
COMPENSATOR SET @ 3000 PSI
PRESSURE FILTER (10 MICRON)
DUMP VALVE
1/4
1/4
1/4
3/8
3/8
3/8
1/4
1/4
1/2
1/2
HOSES THRU HOSE TRACK
PRESSURE FILTER (10 MICRON)
BOOM TELESCOPE
SWING
BOOM LIFT
MANUAL GROUND CONTROLS
DOUBLE COUNTERBALANCE VALVES SET @ 2500 PSI
4.4 GPM
10in.³/ REV
SWING DRIVE MOTOR
(1 RPM SWING SPEED)
CREEP SPEED WHEEL DRIVE
GROUND/ PLATFORM SELECTOR
HIGH SPEED WHEEL DRIVE
STEER
1.6 GPM (RETRACT)
COUNTERBALANCE VALVE SET @ 3600 PSI
3.2 GPM (EXTEND)
BOOM LIFT CYLINDER
(35 SEC. RAISE/LOWER TIME)
SHUTTLE VALVE MANIFOLD
PLATFORM ROTARY ACTUATOR
700 PSI
700 PSI
DOUBLE RELIEF / DOUBLE PILOT CHECK VALVE MANIFOLD
HAND PUMP / NEEDLE VALVE
(DRIVE MOTOR DISCONNECT & BRAKE RELEASE)
Ø.021 ORIFICE
DOUBLE PILOT CHECK VALVE
5.2 GPM (EXTEND)
DOUBLE COUNTERBALANCE VALVE W/ BRAKE SHUTTLE VALVE SET @ 3000 PSI
23.4 GPM (HI SPEED)
3.95 GPM (CREEP)
INTERNAL DISC BRAKE (SPRING APPLIED / HYD RELEASE)
ADAPTER FITTING # 06210800
WHEEL DRIVE MOTORS (FRONT)
4.3 GPM (RETRACT)
STEERING CYLINDER
13.6in.³/ REV
AXLE DISENGAGED
AXLE ENGAGED
ADAPTER FITTING # 06210800
Ø.021 ORIFICE
PLATFORM ROTATE
PLATFORM LEVEL
SWING
BOOM TELESCOPE
BOOM LIFT
WHEEL DRIVE
WHEEL DRIVE MOTOR (REAR)
5.6 GPM (HI SPEED)
.95 GPM (CREEP)
DOUBLE RELIEF VALVES SET @ 3,000 PSI
INTERNAL DISC BRAKE (SPRING APPLIED / HYD RELEASE)
MANUAL PLATFORM CONTROLS
DOUBLE COUNTERBALANCE VALVES SET @ 3000 PSI
REF: P/N 01227200
PRESSURE REDUCING VALVE SET @ 435 PSI
AXLE DISCONNECT CYLINDER
REAR DRIVE AXLE (SIGE)
2.96 MPH (HI SPEED)
.5 MPH (CREEP)
DRIVE CUSHION VALVE
PLATFORM SLAVE LEVEL CYLINDER

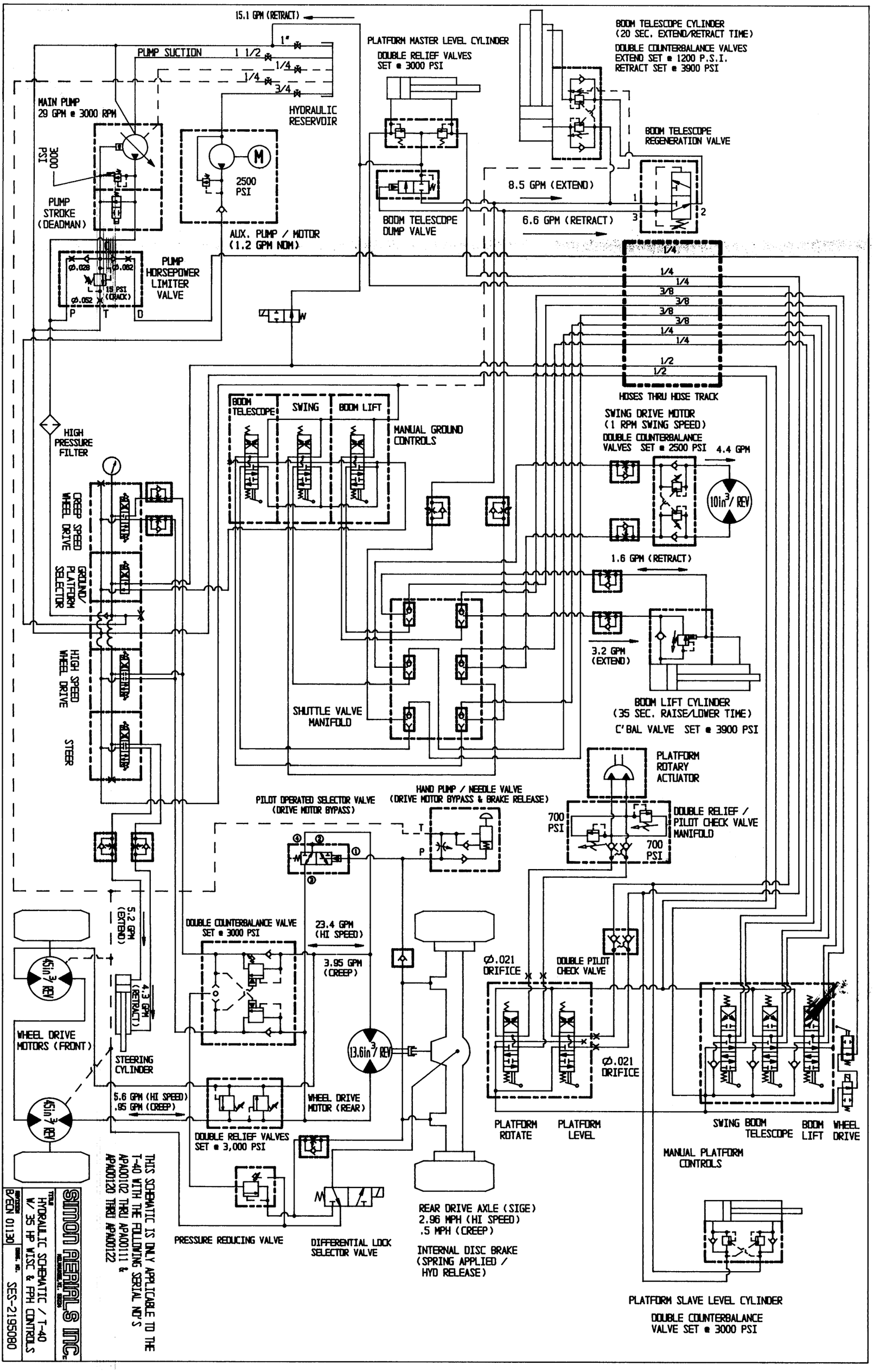
REF: T-40 TRAILBLAZER
W/ DEUTZ F3L1011 ENGINE
FORD VSG-423 ENGINE
HATZ 3L40C ENGINE
} & F.P.H. CONTROLS

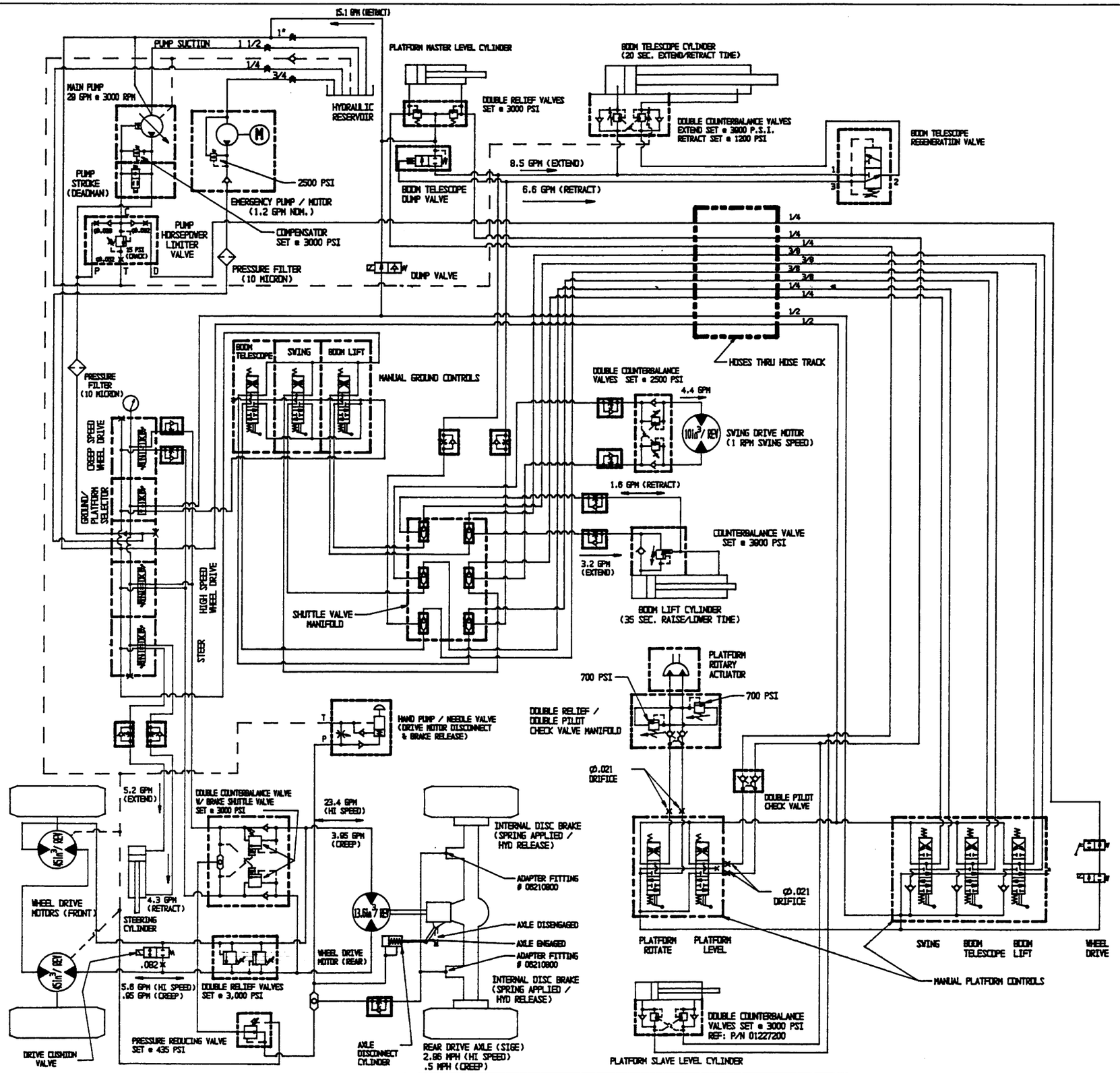
NOTE: THIS SCHEMATIC IS ONLY APPLICABLE TO THE T-40 MODEL WITH SERIAL NUMBERS ABOVE APA00122

SIMON AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: HYDRAULIC SCHEMATIC / T-40

REVISION: E / 12-21-93
DRWG. NO.: E-2306570


15.1 GPM (RETRACT)
PUMP SUCTION
1"
1 1/2
1/4
1/4
3/4
HYDRAULIC RESERVOIR
MAIN PUMP
29 GPM @ 3000 RPM
3000 PSI
PUMP STROKE (DEADMAN)
2500 PSI
AUX. PUMP / MOTOR (1.2 GPM NOM)
PUMP HORSEPOWER LIMITER VALVE
PLATFORM MASTER LEVEL CYLINDER
DOUBLE RELIEF VALVES SET @ 3000 PSI
BOOM TELESCOPE DUMP VALVE
BOOM TELESCOPE CYLINDER (20 SEC. EXTEND/RETRACT TIME)
DOUBLE COUNTERBALANCE VALVES EXTEND SET @ 1200 P.S.I. RETRACT SET @ 3900 PSI
BOOM TELESCOPE REGENERATION VALVE
8.5 GPM (EXTEND)
6.6 GPM (RETRACT)
HOSES THRU HOSE TRACK
HIGH PRESSURE FILTER
BOOM TELESCOPE
SWING
BOOM LIFT
MANUAL GROUND CONTROLS
SWING DRIVE MOTOR (1 RPM SWING SPEED)
DOUBLE COUNTERBALANCE VALVES SET @ 2500 PSI
4.4 GPM
10in³/ REV
1.6 GPM (RETRACT)
3.2 GPM (EXTEND)
BOOM LIFT CYLINDER (35 SEC. RAISE/LOWER TIME)
C'BAL VALVE SET @ 3900 PSI
CREEP SPEED WHEEL DRIVE
GROUND/ PLATFORM SELECTOR
HIGH SPEED WHEEL DRIVE
STEER
SHUTTLE VALVE MANIFOLD
PLATFORM ROTARY ACTUATOR
PILOT OPERATED SELECTOR VALVE (DRIVE MOTOR BYPASS)
HAND PUMP / NEEDLE VALVE (DRIVE MOTOR BYPASS & BRAKE RELEASE)
700 PSI
DOUBLE RELIEF / PILOT CHECK VALVE MANIFOLD
700 PSI
5.2 GPM (EXTEND)
DOUBLE COUNTERBALANCE VALVE SET @ 3000 PSI
23.4 GPM (HI SPEED)
3.95 GPM (CREEP)
Ø.021 ORIFICE
DOUBLE PILOT CHECK VALVE
45in³/ REV
4.3 GPM (RETRACT)
WHEEL DRIVE MOTORS (FRONT)
STEERING CYLINDER
13.6in³/ REV
Ø.021 ORIFICE
5.6 GPM (HI SPEED)
.95 GPM (CREEP)
WHEEL DRIVE MOTOR (REAR)
DOUBLE RELIEF VALVES SET @ 3,000 PSI
PLATFORM ROTATE
PLATFORM LEVEL
SWING
BOOM TELESCOPE
BOOM LIFT
WHEEL DRIVE
MANUAL PLATFORM CONTROLS
REAR DRIVE AXLE (SIGE)
2.96 MPH (HI SPEED)
.5 MPH (CREEP)
INTERNAL DISC BRAKE (SPRING APPLIED / HYD RELEASE)
PRESSURE REDUCING VALVE
DIFFERENTIAL LOCK SELECTOR VALVE
PLATFORM SLAVE LEVEL CYLINDER
DOUBLE COUNTERBALANCE VALVE SET @ 3000 PSI
THIS SCHEMATIC IS ONLY APPLICABLE TO THE T-40 WITH THE FOLLOWING SERIAL NO'S
AP400102 THRU AP400111 &
AP400120 THRU AP400122
SIMON AERIALS INC.
TITLE
HYDRAULIC SCHEMATIC / T-40 W/ 35 HP WISC & FPH CONTROLS
BEGIN 011301
SES-2195080



NOTE: THIS SCHEMATIC IS ONLY APPLICABLE TO THE T-40 MODEL WITH SERIAL NUMBERS ABOVE APA00122

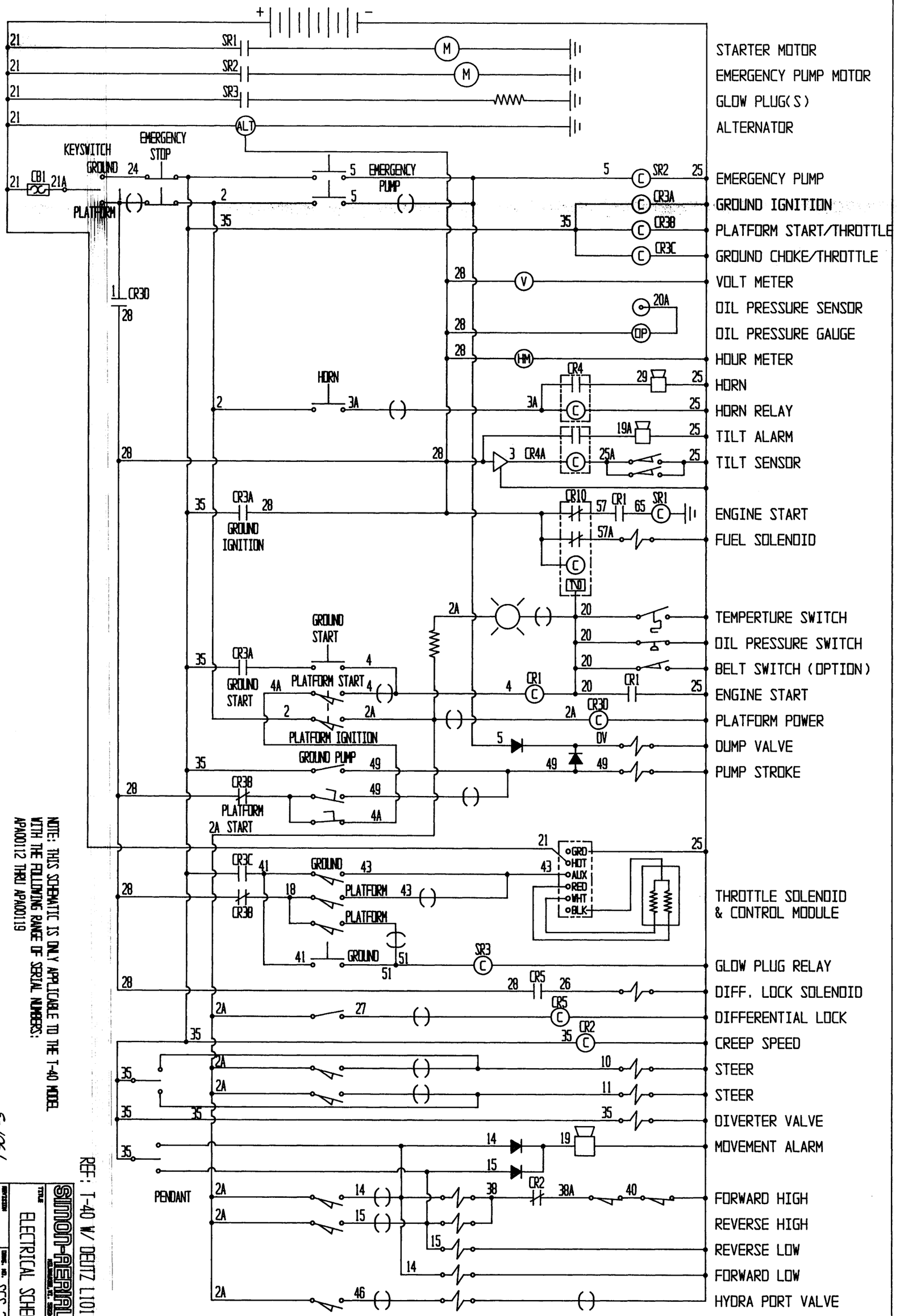
REF: T-40 W/ WISC 35 HP ENGINE & F.P.H. CONTROLS

SIMON AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: HYDRAULIC SCHEMATIC / T-40

REVISION: E / 12-21-93

DRWG. NO. E-2306580



NOTE: THIS SCHEMATIC IS ONLY APPLICABLE TO THE T-40 MODEL WITH THE FOLLOWING RANGE OF SERIAL NUMBERS:
APA00112 THRU APA00119

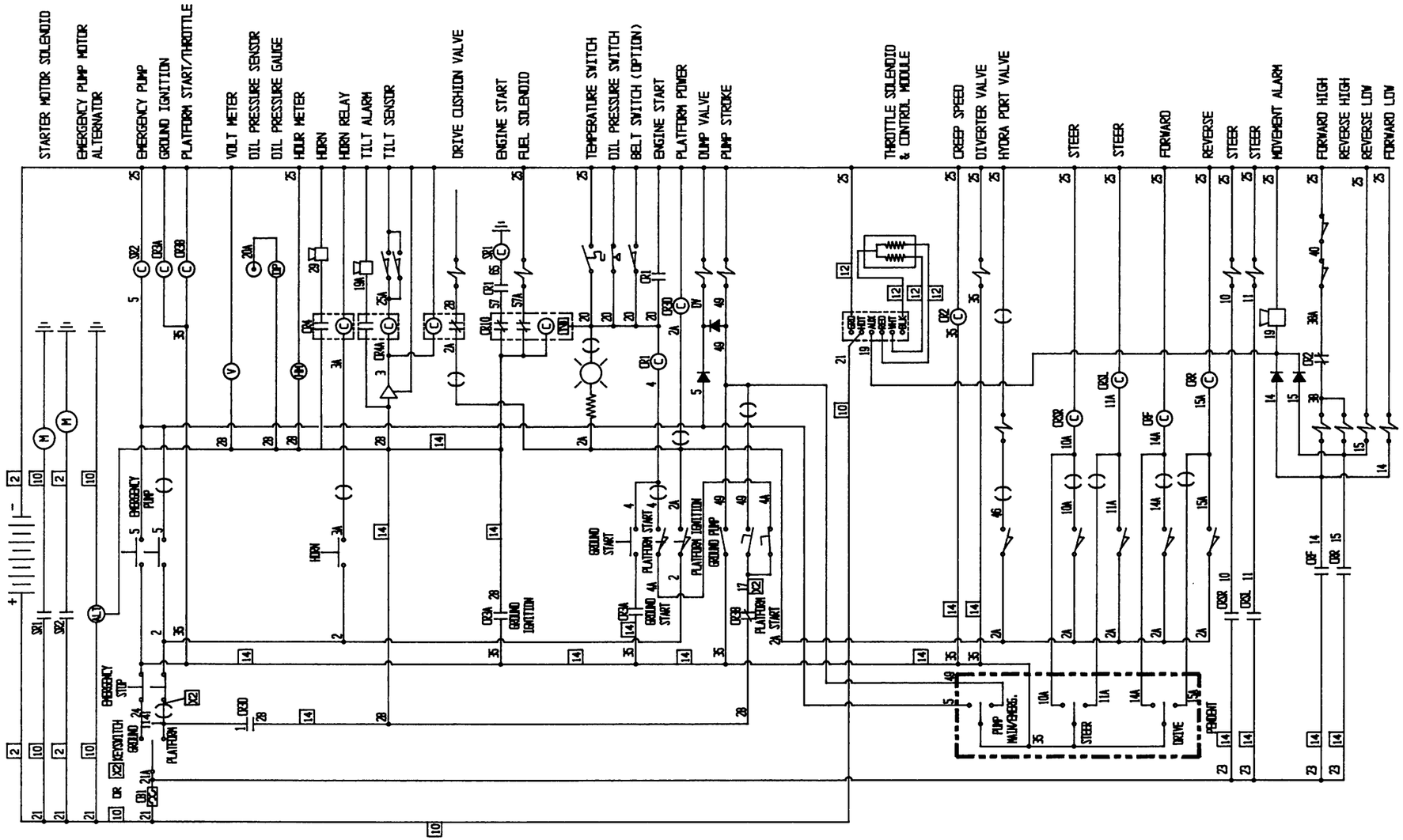
REF: T-40 W/ DEUTZ L1011 ENGINE

E-106/

SIMON-AERIALS INC.

TITLE: ELECTRICAL SCHEMATIC

DRWG. NO. SCS-230288-0



NOTE: THIS SCHEMATIC IS APPLICABLE TO THE T-40 MODEL WITH SERIAL NUMBERS ABOVE APA00122 AND ALL T-60

NOTE: ALL WIRE SIZE TO BE 16 GA. EXCEPT AS NOTED.

2/0	#2/0 AWG
2	#2 AWG
4	#4 AWG
10	#10 AWG
12	#12 AWG
14	#14 AWG
X2	DOUBLE WIRES

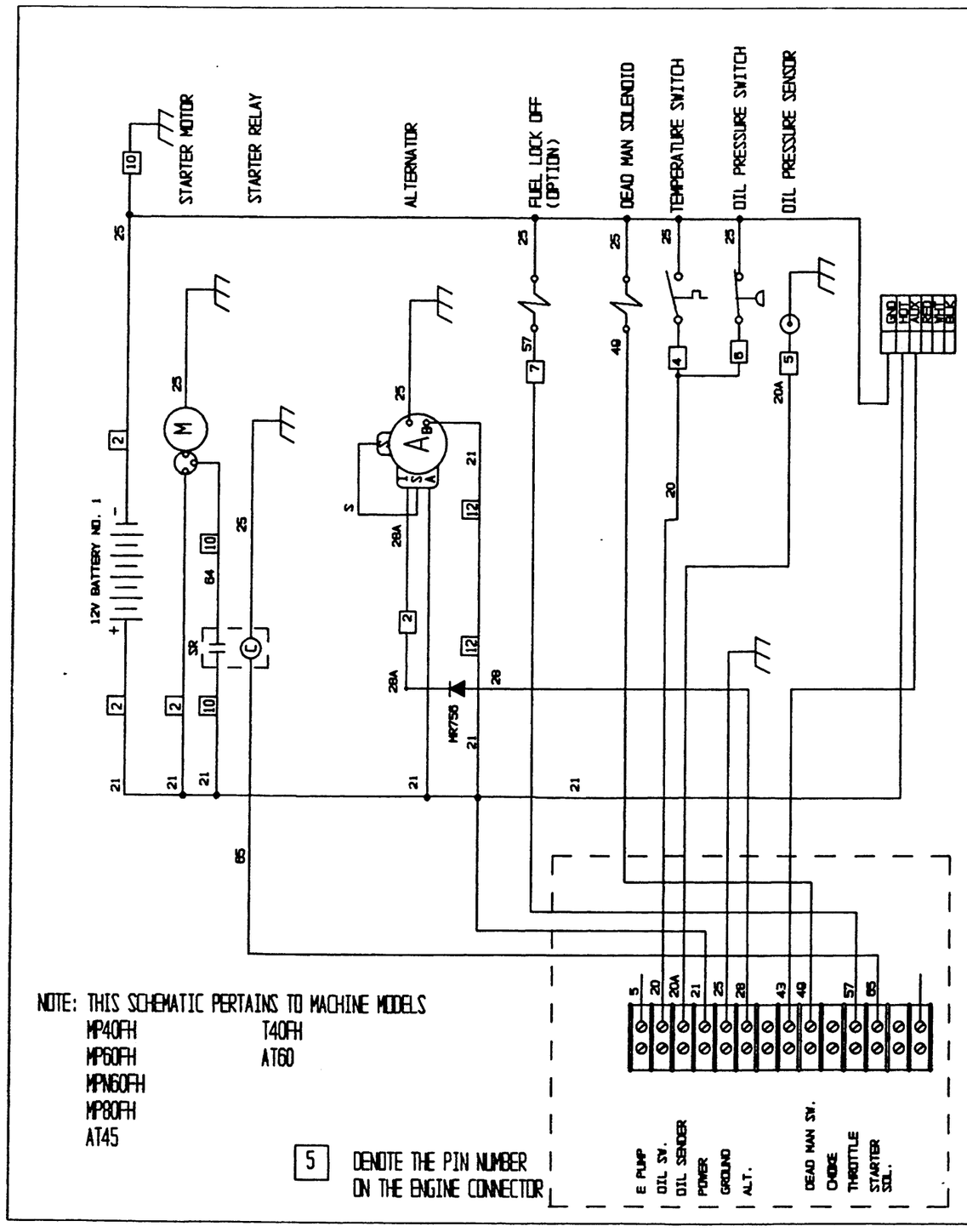
REF: T-40 & T-60 W/ DEUTZ L1011 ENGINE

SIMON-AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: ELECTRICAL SCHEMATIC

REVISION: C

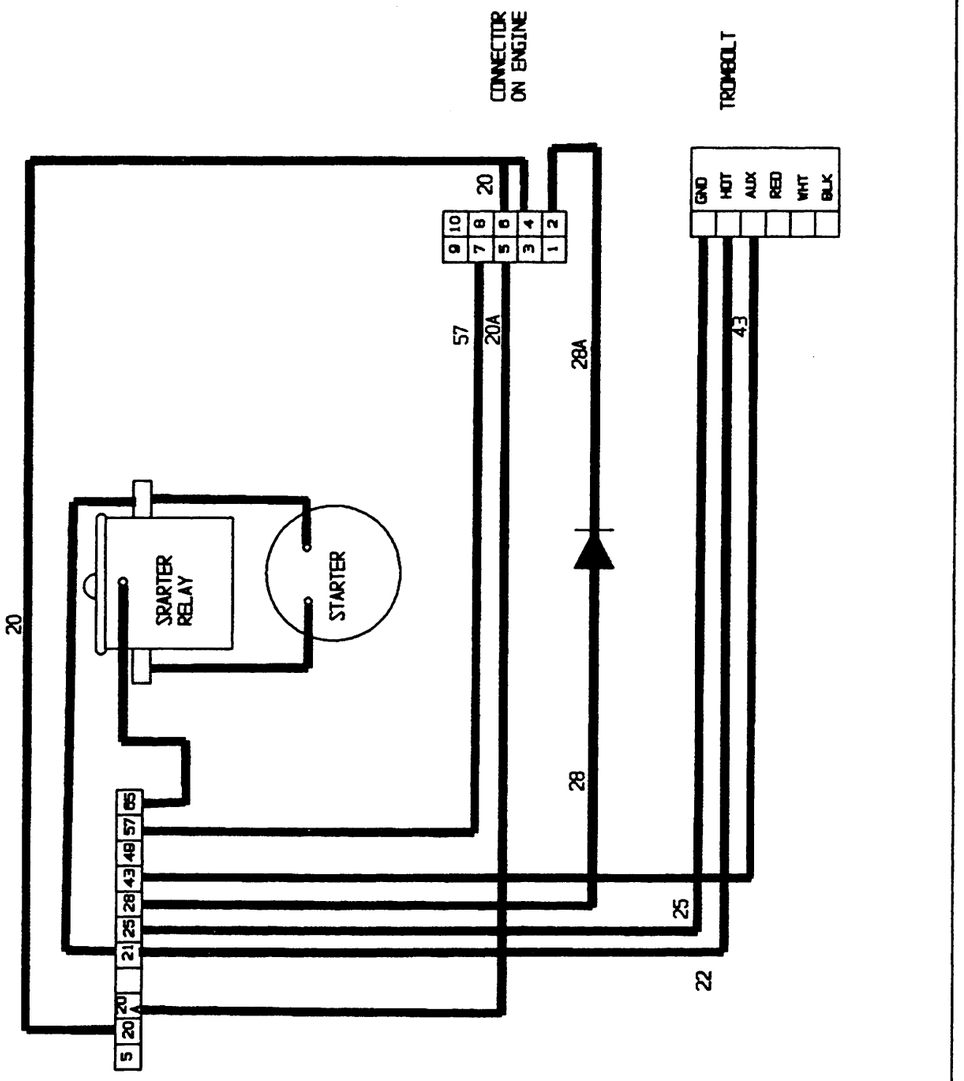
DRWG. NO.: SDS-2306560



NOTE: THIS SCHEMATIC PERTAINS TO MACHINE MODELS

MP40FH	T40FH
MP60FH	AT60
MPN60FH	
MP80FH	
AT45	

5 DENOTE THE PIN NUMBER ON THE ENGINE CONNECTOR



REF: DEUTZ F3L1011 & F4L1011 ALL FH MODELS

UNLESS OTHERWISE SPECIFIED ALL WIRES ARE 16 AWG.

REV	BY	DATE	DESCRIPTION
	RLN	11-1-98	

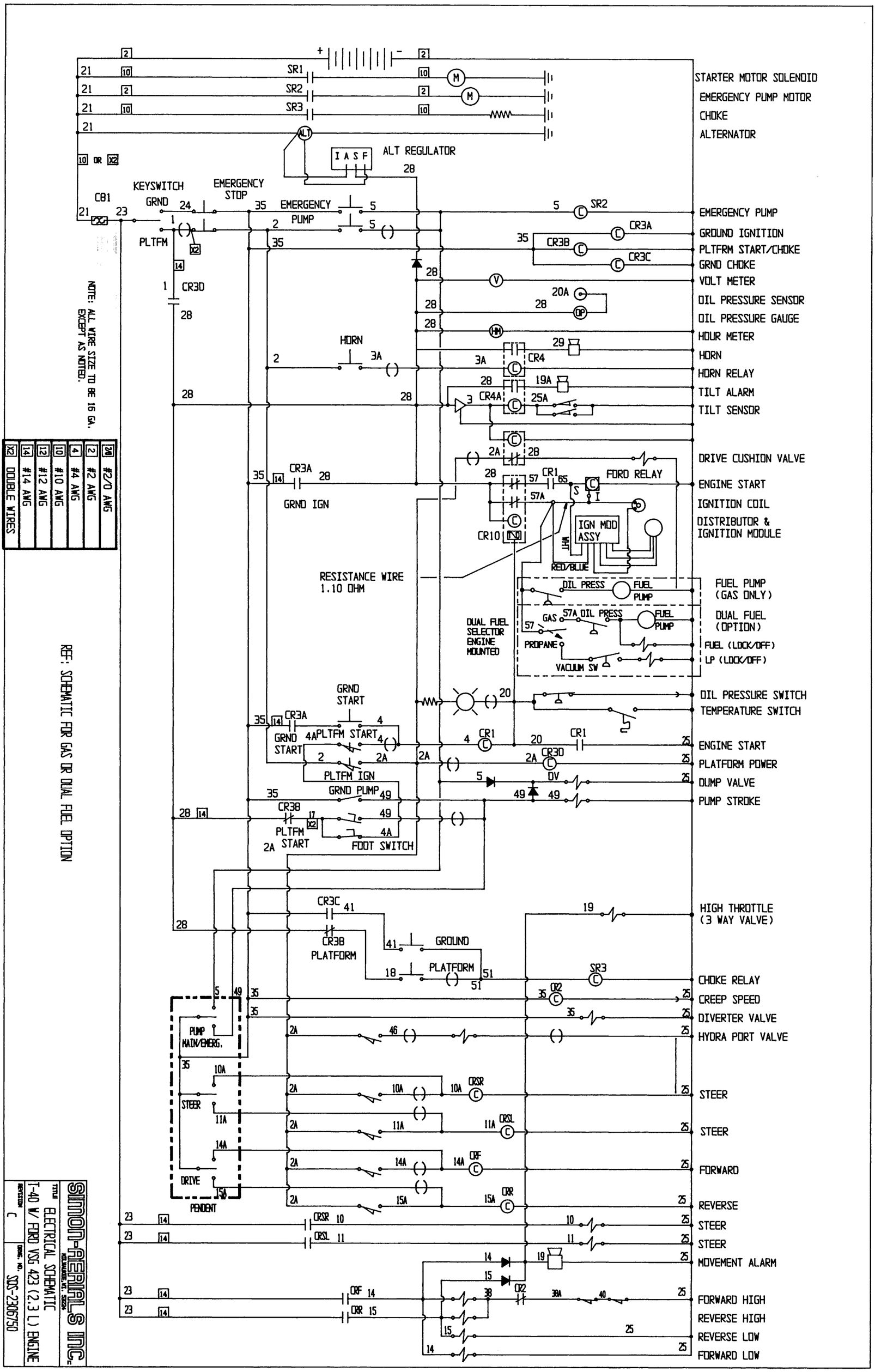
DO NOT SCALE PRINT

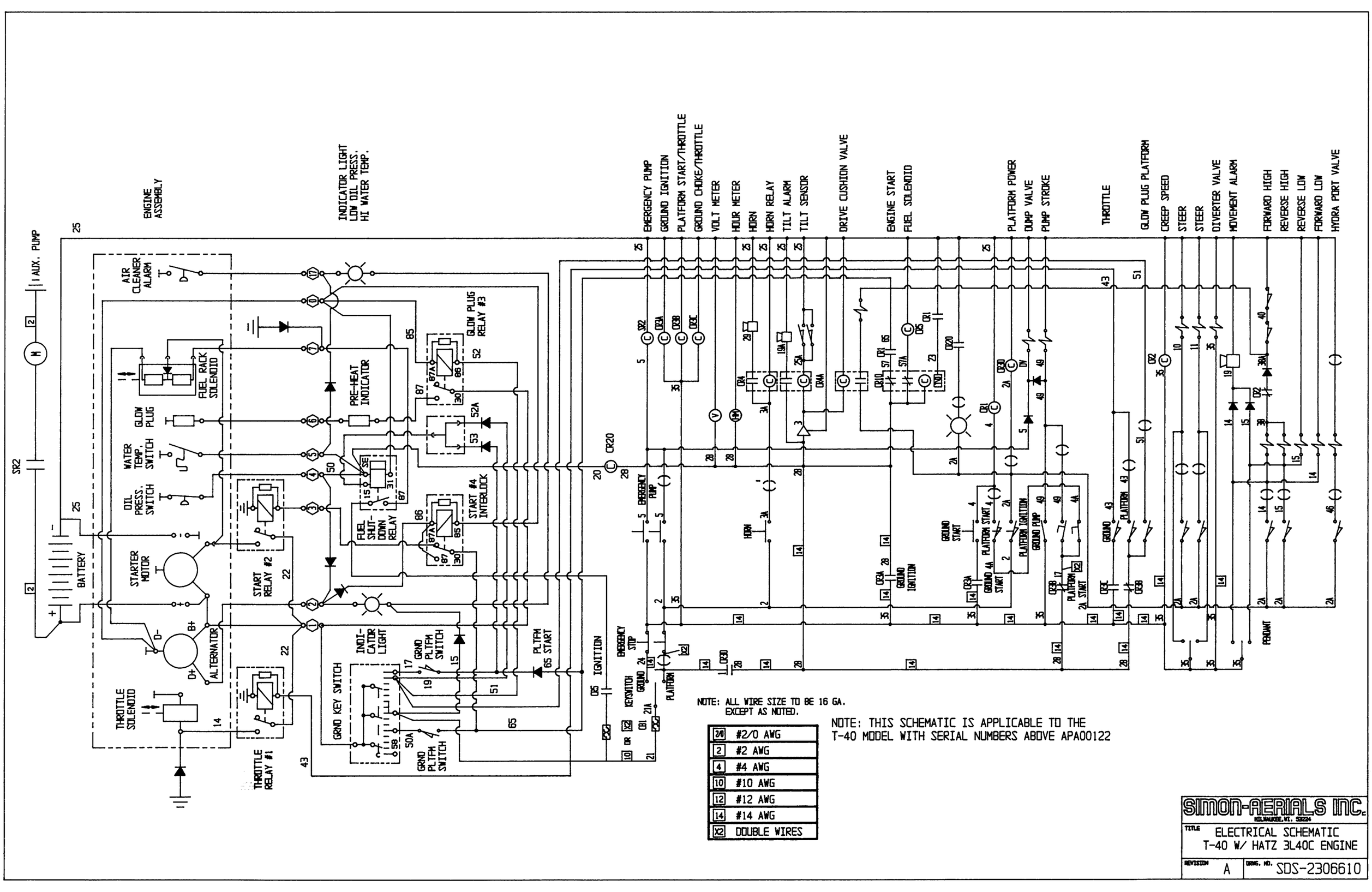
SIMON AERIALS INC.

ELECTRICAL SCHEMATIC

CADKEY DRAWING DO NOT REVISE MANUALLY

NONE | RLN | 11-1-98 | B-2367810


STARTER MOTOR SOLENOID
EMERGENCY PUMP MOTOR
CHOKE
ALTERNATOR
ALT REGULATOR
EMERGENCY PUMP
GROUND IGNITION
PLTFRM START/CHOKE
GRND CHOKE
VOLT METER
OIL PRESSURE SENSOR
OIL PRESSURE GAUGE
HOUR METER
HORN
HORN RELAY
TILT ALARM
TILT SENSOR
DRIVE CUSHION VALVE
ENGINE START
IGNITION COIL
DISTRIBUTOR & IGNITION MODULE
FUEL PUMP (GAS ONLY)
DUAL FUEL (OPTION)
FUEL (LOCK/OFF)
LP (LOCK/OFF)
OIL PRESSURE SWITCH
TEMPERATURE SWITCH
ENGINE START
PLATFORM POWER
DUMP VALVE
PUMP STROKE
HIGH THROTTLE (3 WAY VALVE)
CHOKE RELAY
CREEP SPEED
DIVERTER VALVE
HYDRA PORT VALVE
STEER
STEER
FORWARD
REVERSE
STEER
STEER
MOVEMENT ALARM
FORWARD HIGH
REVERSE HIGH
REVERSE LOW
FORWARD LOW
KEYSWITCH
GRND
EMERGENCY STOP
EMERGENCY PUMP
PLTFM
CB1
CR3D
HORN
CR4
CR4A
CR3A
GRND IGN
CR1
FORD RELAY
CR10
IGN MOD ASSY
WHT
RED/BLUE
RESISTANCE WIRE 1.10 OHM
DUAL FUEL SELECTOR ENGINE MOUNTED
OIL PRESS
FUEL PUMP
GAS
PROPANE
VACUUM SW
GRND START
PLTFM START
PLTFM IGN
GRND PUMP
CR3B
PLTFM START
FOOT SWITCH
CR3C
CR3B PLATFORM
GROUND
PLATFORM
DV
CR2
CRSR
CRSL
CRF
CRR
PUMP MAIN/EMERG.
STEER
DRIVE
PENDENT
NOTE: ALL WIRE SIZE TO BE 16 GA. EXCEPT AS NOTED.
X2 DOUBLE WIRES
14 #14 AWG
12 #12 AWG
10 #10 AWG
4 #4 AWG
2 #2 AWG
00 #2/0 AWG
REF: SCHEMATIC FOR GAS OR DUAL FUEL OPTION
SIMON-AERIALS INC.
MILWAUKEE, WI. 53224
TITLE
ELECTRICAL SCHEMATIC
T-40 W/ FORD VSG 423 (2.3 L) ENGINE
REVISION
C
DRWG. NO.
SDS-230750



NOTE: ALL WIRE SIZE TO BE 16 GA. EXCEPT AS NOTED.

2/0	#2/0 AWG
2	#2 AWG
4	#4 AWG
10	#10 AWG
12	#12 AWG
14	#14 AWG
X2	DOUBLE WIRES

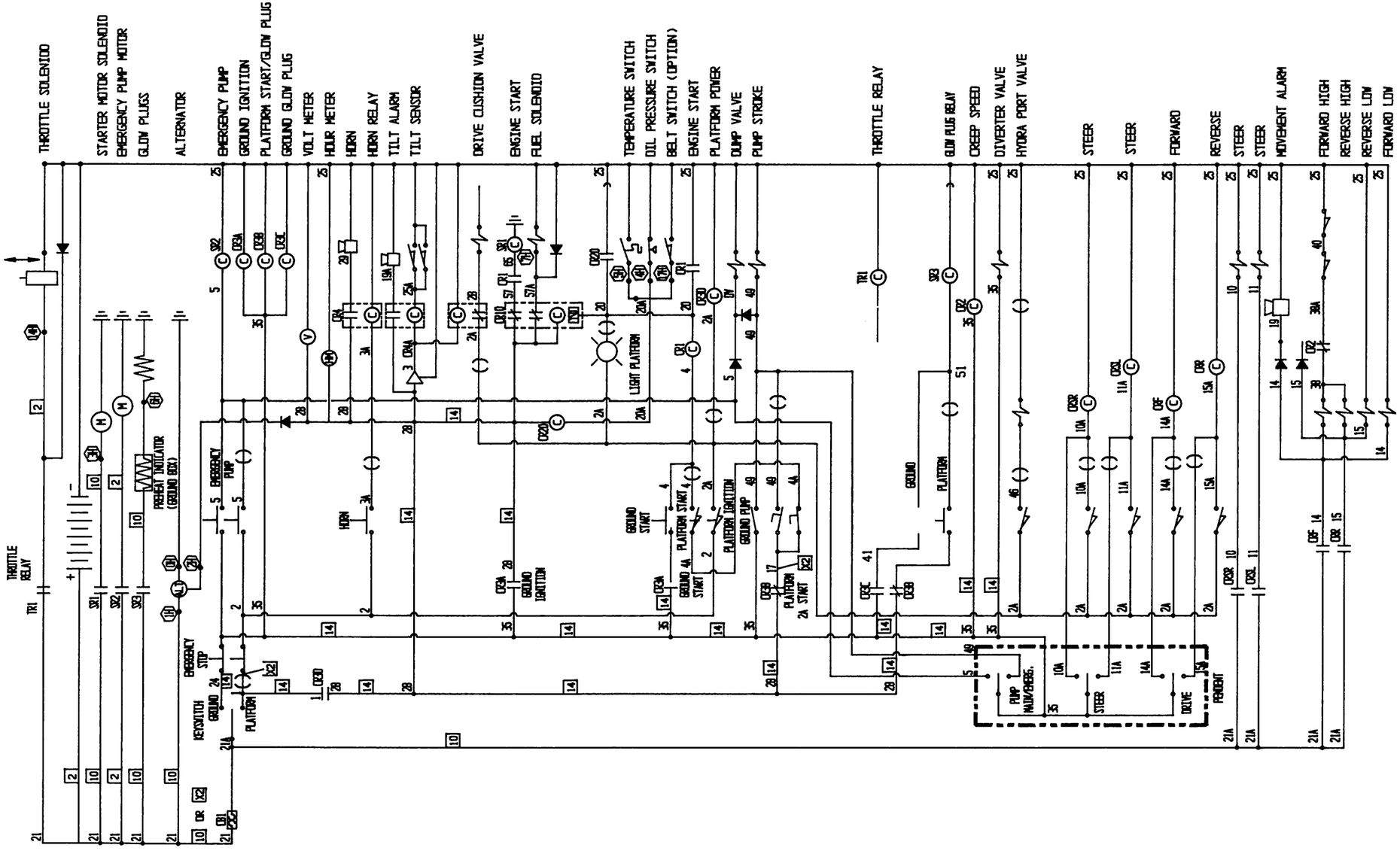
NOTE: THIS SCHEMATIC IS APPLICABLE TO THE T-40 MODEL WITH SERIAL NUMBERS ABOVE APA00122

SIMON-AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: ELECTRICAL SCHEMATIC T-40 W/ HATZ 3L40C ENGINE

REVISION: A

DRWG. NO.: SDS-2306610



NOTE: ALL WIRE SIZE TO BE 16 GA. EXCEPT AS NOTED.

20	#2/0 AWG
2	#2 AWG
4	#4 AWG
10	#10 AWG
12	#12 AWG
14	#14 AWG
X2	DOUBLE WIRES

NOTE: THIS SCHEMATIC IS APPLICABLE TO THE T-40 MODEL WITH SERIAL NUMBERS ABOVE APA00150

⬡ = CONNECTION TO HATZ ENGINE

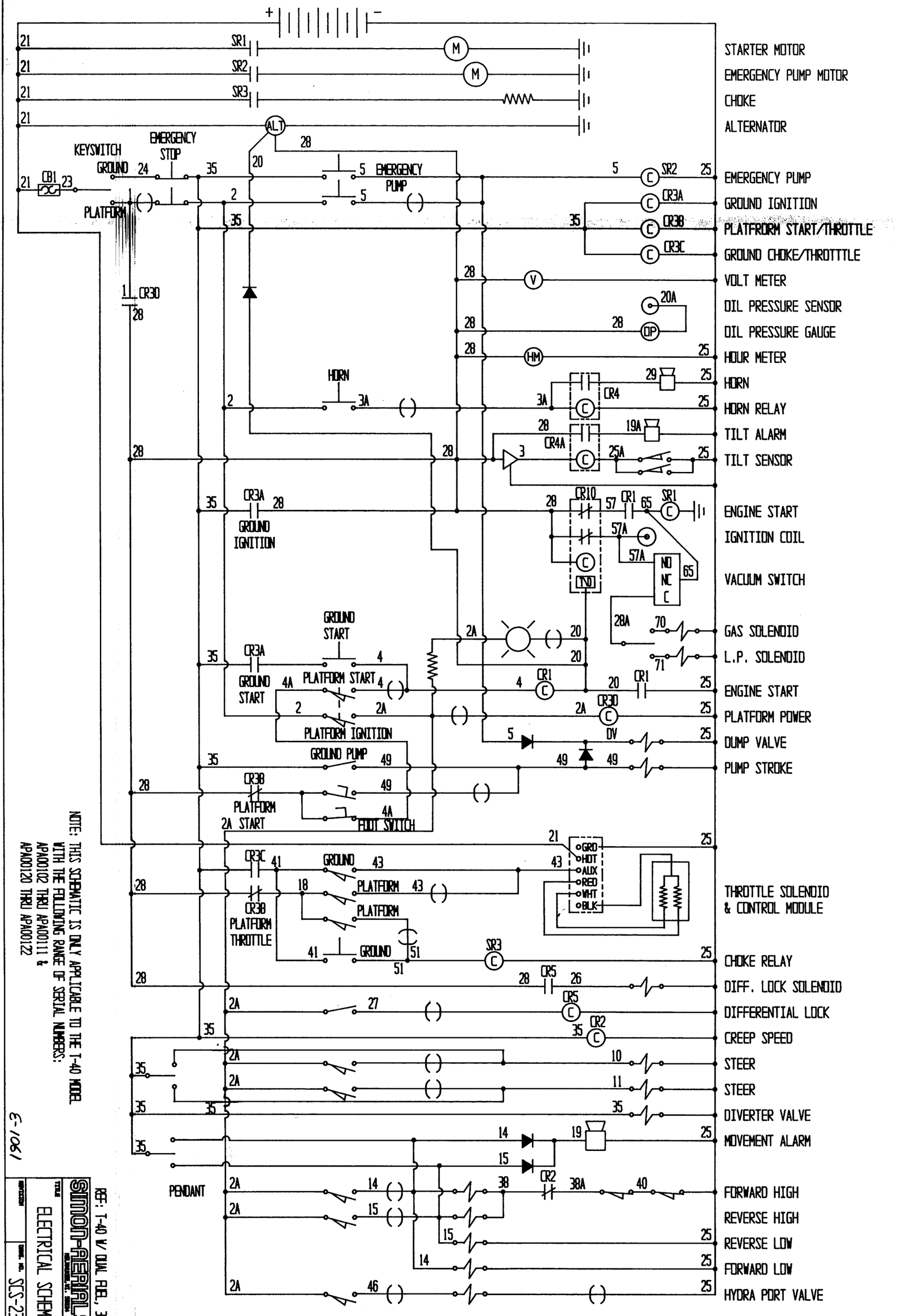
REF: T-40 W/ HATZ 3L40C ENGINE

SIMON-AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: ELECTRICAL SCHEMATIC

REVISION: C

DRWG. NO.: SDS-2306720



NOTE: THIS SCHEMATIC IS ONLY APPLICABLE TO THE T-40 MODEL WITH THE FOLLOWING RANGE OF SERIAL NUMBERS:
APA00102 THRU APA00111 &
APA00120 THRU APA00122

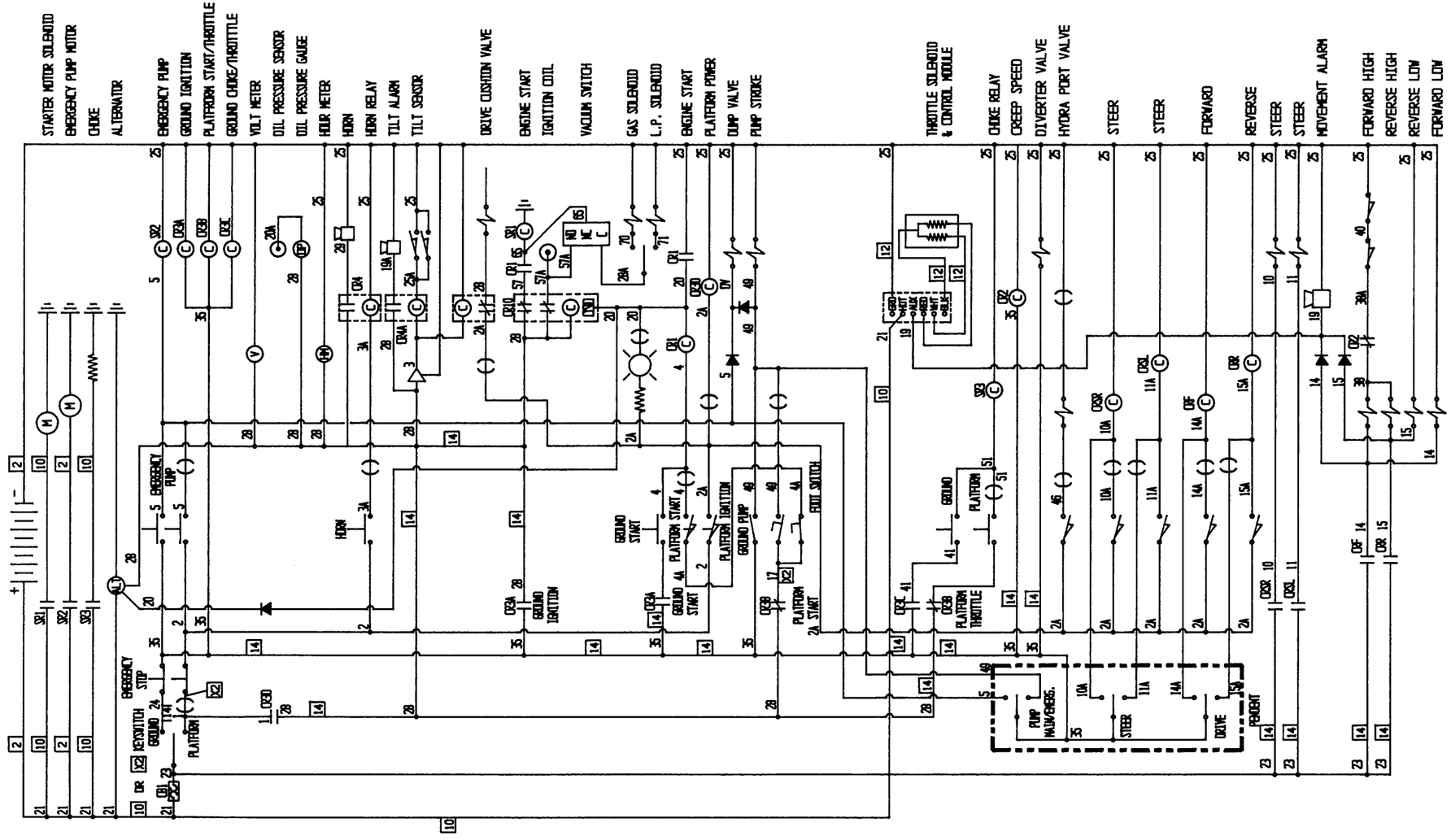
E-1061

REF: T-40 W/ DUAL FUEL, 35 HP VISC.

SIMON-AERIALS INC.

ELECTRICAL SCHEMATIC

SCS-230289-0



NOTE: THIS SCHEMATIC IS APPLICABLE TO THE T-40 MODEL WITH SERIAL NUMBERS ABOVE APA00122

NOTE: ALL WIRE SIZE TO BE 16 GA. EXCEPT AS NOTED.

20	#2/0 AWG
2	#2 AWG
4	#4 AWG
10	#10 AWG
12	#12 AWG
14	#14 AWG
X2	DOUBLE WIRES

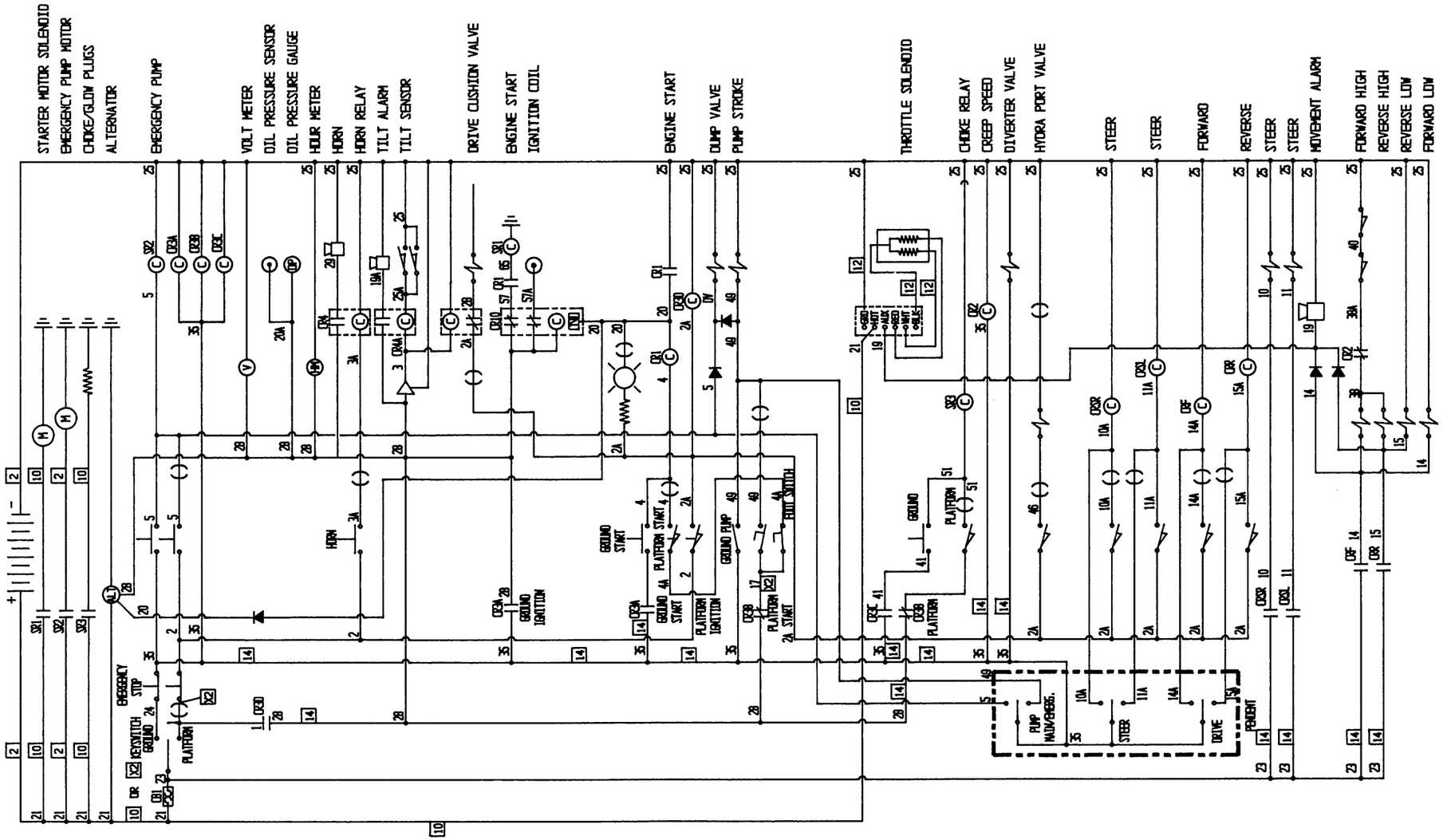
REF: T-40 W/ DUAL FUEL, 35 H.P VISC. ENGINE

SIMON-AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: ELECTRICAL SCHEMATIC

REVISION: C

DRWG. NO.: SCS-2306550



NOTE: ALL WIRE SIZE TO BE 16 GA. EXCEPT AS NOTED.

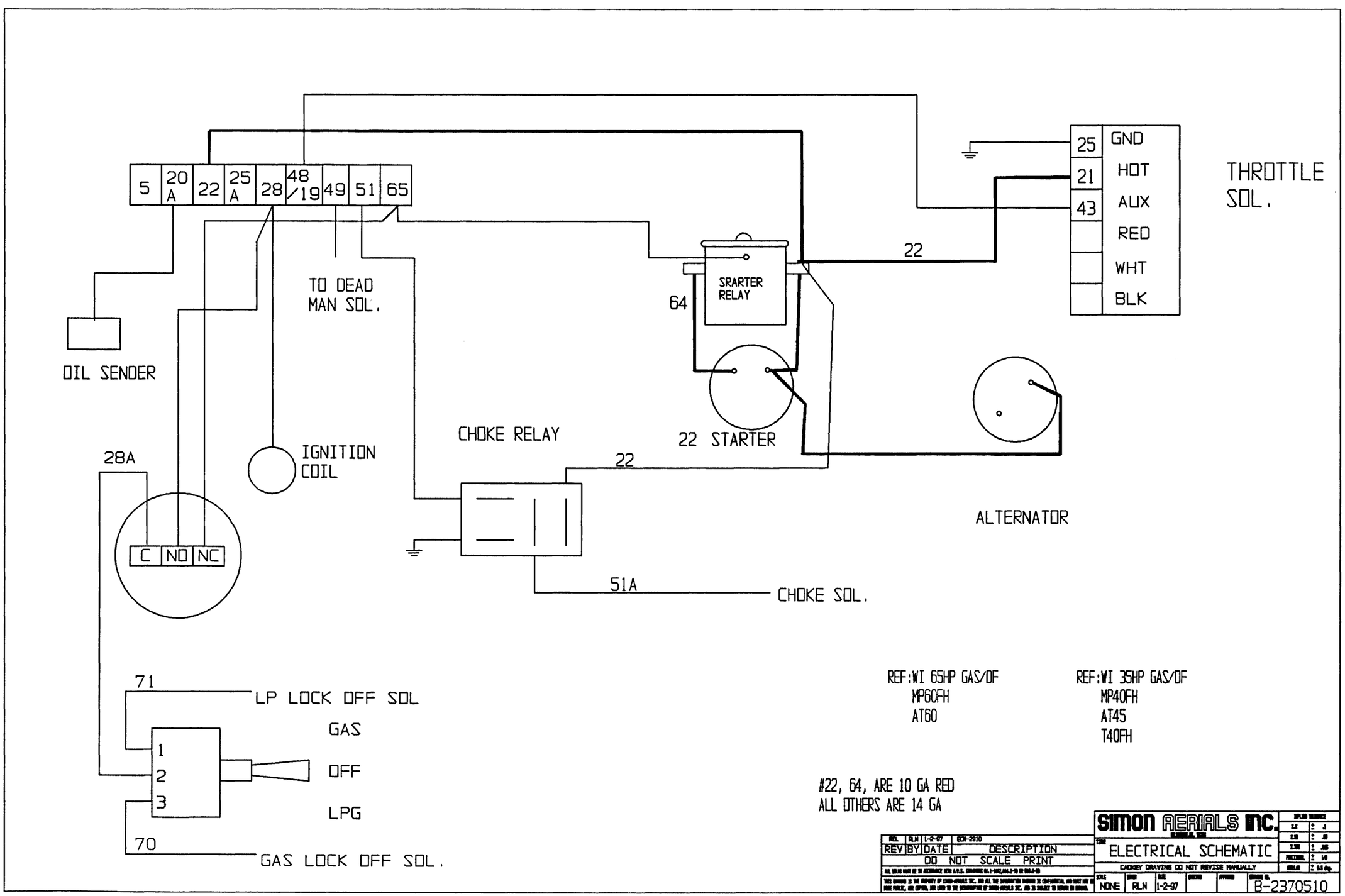
2/0	#2/0 AWG
2	#2 AWG
4	#4 AWG
10	#10 AWG
12	#12 AWG
14	#14 AWG
X2	DOUBLE WIRES

NOTE: THIS SCHEMATIC IS APPLICABLE TO THE T-40 MODEL WITH SERIAL NUMBERS ABOVE APA00122

REF: T-40 W/ WISCONSIN 35 HP. ENGINE

SIMON-AERIALS INC.
MILWAUKEE, WI. 53224

TITLE	
ELECTRICAL SCHEMATIC	
REVISION: C	DRWG. NO.: D-2306540



REF:WI 65HP GAS/DF
MP60FH
AT60

REF:WI 35HP GAS/DF
MP40FH
AT45
T40FH

#22, 64, ARE 10 GA RED
ALL OTHERS ARE 14 GA

REV	BY	DATE	DESCRIPTION
	RLN	1-2-97	ECN-2910
DO NOT SCALE PRINT			

SIMON AERIALS INC.

TITLE: ELECTRICAL SCHEMATIC

CADKEY DRAWING DO NOT REVISE MANUALLY

SCALE	DRWN	DATE	CHKD	APPRVD	DRAWING NO.
NONE	RLN	1-2-97			B-2370510