

Parts
and
Service Manual
for

**Model
2033ES
Aerial
Work
Platform**



Aerial Work Platforms

#8808
REVISION 3
6/99

Limited Owner Warranty

Mayville Engineering Company, Inc. (MEC) warrants its equipment to the original purchaser against defects in material and/or workmanship under normal use and service for one (1) year from date of registered sale or date the unit left the factory if not registered. MEC further warrants the structural weldments of the main frame and scissor arms as defined in MEC's current Warranty Policy & Procedures, to be free from defects in material or workmanship for five (5) years from date of registered sale or date unit left the factory if not registered. Excluded from such warranty is the battery(s) which carries a ninety (90) day warranty from described purchased date and prorated thereafter up to one (1) year. Warranty claims within such warranty period shall be limited to repair or replacement, at MEC's option, of the defective part in question and labor to perform the necessary repair or replacement based on MEC's then current flat rate, provided the defective part in question is shipped prepaid to MEC and is found upon inspection by MEC to be defective in material and/or workmanship. Mayville Engineering Company, Inc. shall not be liable for any consequential, incidental or contingent damages whatsoever. Use of other than factory authorized parts, misuse, improper maintenance or modification of the equipment voids this warranty. The foregoing warranty is exclusive and in lieu of all other warranties, express or implied. All such other warranties, including implied warranties of merchantability and of fitness for a particular purpose, are hereby excluded. No Dealer, Sales Representative, or other person purporting to act on behalf of MEC is authorized to alter the terms of this warranty, or in any manner assume on behalf of MEC any liability or obligation which exceeds MEC's obligations under this warranty.

Foreword

The purpose of this manual is to provide users with the operating procedures essential for the promotion of proper machine operation for its intended purpose. It is important to over stress proper machine usage. All information in this manual should be **READ** and **UNDERSTOOD** before any attempt is made to operate the machine. **YOUR OPERATING MANUAL IS YOUR MOST IMPORTANT TOOL** - keep it with the machine. **REMEMBER THAT ANY EQUIPMENT IS ONLY AS SAFE AS THE OPERATOR.**

BECAUSE THE MANUFACTURER HAS NO DIRECT CONTROL OVER MACHINE APPLICATION AND OPERATION, PROPER SAFETY PRACTICES ARE THE RESPONSIBILITY OF THE USER AND ALL OPERATING PERSONNEL.

ALL INSTRUCTIONS IN THIS MANUAL ARE BASED ON THE USE OF THE MACHINE UNDER PROPER OPERATING CONDITIONS, WITH NO DEVIATION FROM THE ORIGINAL DESIGN. ANY ALTERATION AND/OR MODIFICATION OF THE MACHINE IS STRICTLY FORBIDDEN WITHOUT EXPRESS WRITTEN APPROVAL FROM MAYVILLE ENGINEERING COMPANY, INC.

All procedures herein are based on the use of the machine under proper operating conditions, with no deviations from original design intent as per ANSI regulations.

Read and Comply

The ownership, use, service and/or maintenance of this machine is subject to various federal, state and local laws and regulations. It is the responsibility of the owner/user to be knowledgeable of these laws and regulations and comply with them. The owner/user/operator must be familiar with Sections 6, 7, 8, 9 and 10 of ANSI A92.6 Standard. These sections contain the responsibilities of the owners, users, operators, lessors and lessees concerning safety, training, inspection, maintenance, application and operation.

! WARNING

Any modification of this machine without the express written consent of Mayville Engineering Co. (MEC) is prohibited. Do not replace any component or part with anything other than the original replacement parts without the Mayville Engineering Company's (MEC) consent.

2033ES Service & Parts Manual

Chapter 1 Maintenance

- Speed Limit Switch Adjustment
 - 1-1 Speed and Pothole Limit Switches
- Hydraulic Valve Adjustment
 - Operating Pressure Relief
 - Steering Pressure Relief
 - Counter Balance Valve
 - Down Flow Control
- Brake Adjustment
 - 1-2 Brake Adjustment

Chapter 2 Troubleshooting

- General Troubleshooting
- Motor Controller LED Diagnostic System
 - Fig 2-1 LED Diagnostics
 - Table 2-1 LED Diagnostics Definitions
- Service Helps
- Troubleshooting
 - Table 2-2 Troubleshooting Table
 - Fig 2-2 2033ES Electrical Schematic
 - Fig 2-3 2033ES Hydraulic Schematic
 - Fig 2-4 2033ES Hydraulic Schematic – Europe
- Troubleshooting Flow Charts

Chapter 3 Control Boxes

- Fig 3-1 2033ES Upper Control Box
- Fig 3-2 2033ES Control Box Cam Assembly
- Fig 3-3 2033ES Control Arm Assembly

Chapter 4 Platform & Rails

- Fig 4-1 2033ES Platform and Rail Assembly
- Fig 4-1a 2033ES Platform and Rail Assembly
- Fig 4-2 2033ES Extended Platform & Rails
- Fig 4-2a 2033ES Extended Platform & Rails
- Fig 4-3 2033ES Rear Gate Assembly
- Fig 4-4 2033ES Platform Lock Assembly
- Fig 4-4a 2033ES Platform Lock Assembly
- Fig 4-5 2033ES Roller Bracket Assembly

Chapter 5 Scissors & Lift Mech.

- Fig 5-1 2033ES Scissor Assembly
- Fig 5-2 2033ES Maintenance Lock Assembly
- Fig 5-3 2033ES Scissor Identification
- Fig 5-4 2033ES Slide Assembly
- Fig 5-4a 2033ES Slide Assembly
- Fig 5-4b 2033ES Slide Assembly
- Fig 5-5 2033ES Lift Cylinder – US
- Fig 5-5a 2033ES Lift Cylinder – US
- Fig 5-6 2033ES Lift Cylinder – Europe
- Fig 5-6a 2033ES Lift Cylinder – Europe
- Fig 5-7 2033ES Pothole Bar Mechanism Assembly

2033ES Service & Parts Manual

Chapter 6 Axles

- Fig 6-1 2033ES Front Axle
- Fig 6-2 2033ES Steering Assembly
- Fig 6-3 2033ES Steering Cylinder
- Fig 6-4 2033ES Rear Axle and Brake Assembly
- Fig 6-4a 2033ES Rear Axle and Brake Assembly
- Fig 6-5 2033ES Brake Drum Hub Assembly
- Fig 6-6 2033ES Brake Cylinder Assembly

Chapter 7 Hydraulics

- Fig 7-1 2033ES Hydraulic System Layout
- Fig 7-2 2033ES Hydraulic Reservoir Assembly
- Fig 7-3 2033ES Main Hydraulic Manifold
- Fig 7-4 2033ES Speed/Power Manifold
- Fig 7-5 2033ES Lowering Manifold

Chapter 8 Base

- Fig 8-1 2033ES Base Covers
- Fig 8-2 2033ES Motor Cabinet
- Fig 8-3 2033ES Motor Cabinet Door
- Fig 8-4 2033ES Electrical Schematic, Door
- Fig 8-5 2033ES Pump/Motor Assembly
- Fig 8-6 2033ES Battery and Motor Cables
- Fig 8-7 2033ES Battery Disconnect Assembly
- Fig 8-8 2033ES Warning Light and Converter
- Fig 8-9 2033ES Access Ladder Assembly
- Fig 8-10 2033ES Static Strap Assembly
- Fig 8-11 2033ES Pothole and Speed Limit Switch
- Fig 8-11a 2033ES Pothole and Speed Limit Switch

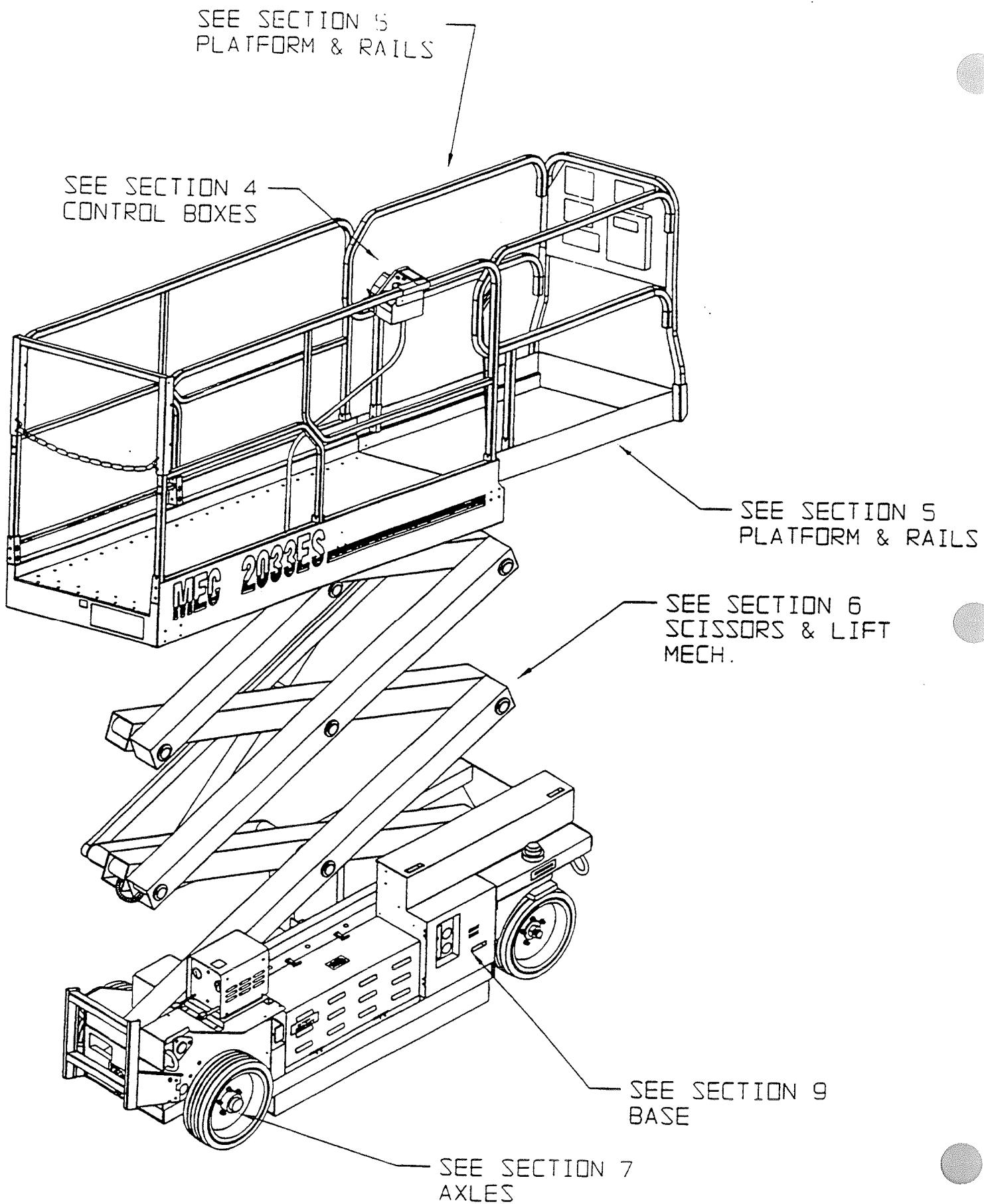
Chapter 9 Decals

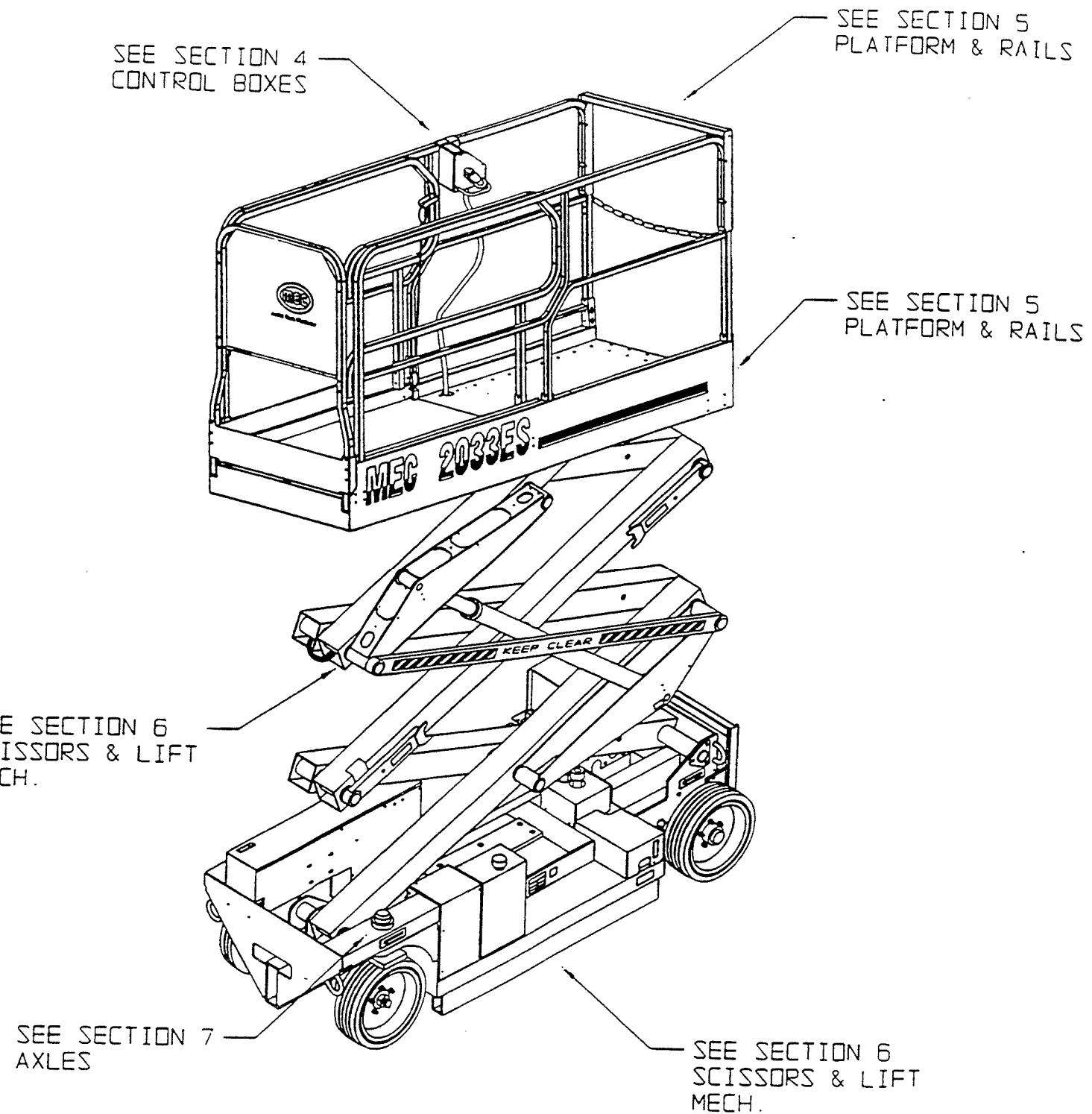
- Fig 9-1 2033ES Decals

WARNING

DO NOT PERFORM PRELIMINARY INSTALLATIONS, OPERATE, SERVICE, REPLACE, ADJUST OR MAINTAIN EQUIPMENT ON THIS MACHINE UNTIL YOU HAVE THOROUGHLY READ AND UNDERSTOOD THE OPERATION AND SAFETY MANUAL, AND HAVE READ AND UNDERSTOOD ALL THE SECTIONS OF THIS MANUAL THAT APPLY TO THE JOB YOU ARE DOING ON THIS MACHINE.

FAILURE TO COMPLY WITH ALL WARNINGS POSTED ON THIS MACHINE AND WRITTEN IN THESE MANUALS, COULD CAUSE DEATH, SERIOUS INJURY OR PROPERTY DAMAGE.





Fall Protection Notice

The **Guardrail** System around the perimeter of the platform is the **fall protection system** for self-propelled elevating work platforms per the American National Standards Institute ANSI/SIAA92.6 Standard. It is **prohibited** to use an Aerial Work Platform manufactured by Mayville Engineering Company, Inc. with any portion, or all, of the guardrails **removed**.

Lanyard anchorage points on this type of equipment are not required to conform to the applicable ANSI/SIA Standard.

However, if anchorage points for lanyard attachments are required by site authorities, or other regulations, the anchorage points on all equipment manufactured by Mayville Engineering Company, Inc. are recommended to be used for **work positioning restraints** of personnel only. Lanyard lengths are to be determined by operator/owner to restrict the operator to the confines within the **Guardrail** System.

WARNING

Use of fall arrest systems attached to anchorage points on mobile equipment may cause machine to tip resulting in serious injury or death.



WARNING

- ↳ Failure to comply with **Safety Precautions** could result in death or serious injury.
- ↳ Shut off all power, making the machine inoperative before making any adjustments, performing maintenance, or replacing components.
- ↳ Platform should be in the fully stowed position if possible, or maintenance locks should be in place.
- ↳ Hydraulic pressures should be relieved before loosening or replacing components.
- ↳ Do not replace any component or part with anything other than original MEC replacement parts without the manufacturers consent.
- ↳ Remove all rings, watches, and jewelry before performing any maintenance.
- ↳ Restrain long hair, and do not wear loose clothing or neckties which could become caught or entangled in the equipment.
- ↳ Observe and obey all warnings and cautions on machines and in manuals.
- ↳ Keep oil, grease, water, etc. wiped from all standing surfaces and hand holds.
- ↳ Use only approved, non flammable cleaning solvents.
- ↳ Altering or disabling safety devices is **strictly** prohibited.

Following are definitions of labeling you might encounter on aerial platforms.

▲ CAUTION

CAUTION - Hazards or unsafe practices which **COULD** result in minor personal injury or product damage.

▲ WARNING

WARNING - Hazards or unsafe practices which **COULD** result in severe personal injury or death.

▲ DANGER

DANGER - Immediate hazards which **WILL** result in severe personal injury or death.

GENERAL OPERATING RULES, SAFETY AND LIMITATIONS

MEC designs the 2033ES work platforms to be safe and reliable. They are rugged and maneuverable, but must be used only for purposes and in ways intended. **That is to raise personnel, tools, and necessary equipment to overhead work areas.**

- The owner/user/operator of the machine should not accept operation responsibility until this manual has been read and operation of the machine, under the supervision of an experienced and qualified operator, has been completed. Owner/user/operator must be familiar with sections 6, 7, 8, 9 and 10 of ANSI A92.6-1990. These sections contain the responsibilities of the owner, users, operators, lessors and lessees concerning safety, training, inspection, maintenance, application and/or operation. If there is a question on application and/or operation, Mayville Engineering Co., Inc. should be consulted.
- Respect your machine; **do not** neglect or misuse it.
- Inspect your machine before using. **Do not** use machine if it is not working properly in any way.
- Check job site for unsafe working conditions. **Do not** operate on uneven or soft terrain. **Do not** raise platform if machine is on an incline.
- Use machine only for purposes for which it was designed.
- Never take chances. **Do not** use machine if your physical or mental capabilities are limited due to illness or tiredness, or if you are taking over the counter or prescription drugs which might impair or limit your mental or physical capabilities.
- **Do not** exceed the load capacity of the platform.

- **Do not** smoke while charging the batteries.
- **Do not** enter or exit platform while machine is in motion.
- An operator of any type of work platform is subject to certain hazards that cannot be protected by mechanical means. It is therefore essential that operators be competent, careful, physically and mentally fit and thoroughly trained in safe operation of this machine.
- It is imperative that MAYVILLE ENGINEERING be notified immediately of any incident involving a MEC product. Even if no injury or property damage is evident, the factory should be contacted by telephone and provided with all necessary details. It should be noted that failure to notify the Manufacturer of an incident involving a MEC product within 48 hours of such an occurrence may void any warranty consideration on that particular machine.

▲ DANGER

DO NOT OPERATE MACHINE NEAR POWER LINES. THE PLATFORM AND ENCLOSURES ARE NOT INSULATED.

FAILURE TO FOLLOW THIS WARNING WILL CAUSE DEATH OR PERSONAL INJURY.

OPERATOR QUALIFICATIONS

All MEC aerial work platforms must be operated and maintained by qualified personnel only!

To qualify for operation and maintenance of this unit, an individual must read and thoroughly understand this manual and undergo training by a competent instructor. If a proposed operator or maintenance person fails to understand any segment of this manual, his or her supervisor can clarify the misunderstanding through written correspondence or a phone call to:

Mayville Engineering Company., Inc.
Aerial Work Platforms
210 Corporate Drive
Beaver Dam, WI 53916 USA

Phone: (920) 887-2518
FAX: 920-887-2480

HYDRAULIC VALVE ADJUSTMENT

**WARNING**

NEVER SET THE OPERATING PRESSURE OF ANY COMPONENT HIGHER THAN RECOMMENDED.

SETTING PRESSURES HIGHER THAN RECOMMENDED COULD DAMAGE HOSES AND OTHER HYDRAULIC COMPONENTS AND RESULT IN DEATH, PERSONAL INJURY OR PROPERTY DAMAGE.

Operating Pressure Relief

Connect pressure gauge (0-3500 PSI) with female quick disconnect (P/N 8434) to primary test port (P/N 7572) and elevate platform to full extension. Hold switch to UP position until an accurate reading results on the gauge.

If adjustment is needed, set pressure to proper setting provided in the Operation and Safety Manual. Also, refer to the Hydraulic Schematics and Main Manifolds for more information.

Loosen lock nut on relief valve. Turn the adjustment screw *in* to increase the pressure and *out* to decrease the pressure. When set, tighten the lock nut and retest.

Steering Pressure Relief

Plumb a pressure gauge capable of 3000 PSI into the primary test port and energize the steering to full left. Hold switch long enough until an accurate reading results on the gauge.

If adjustment is needed, set pressure to proper setting provided in the Operation and Safety Manual. Also, refer to the Hydraulic Schematics and Main Manifolds for more information.

Loosen lock nut on steering relief valve and turn the adjustment screw *in* to increase the pressure and *out*

to decrease the pressure. When set, tighten the lock nut and retest.

Counter Balance Valve

Install pressure gauge at test port. Remove forward 3 way valve/wire #11 from cavity. Install #10 SAE port plug temporarily in open cavity to seal. Activate forward drive and observe reading.

If adjustment is needed, set pressure to proper setting provided in the Operation and Safety Manual. Also, refer to the Hydraulic Schematics and Main Manifolds for more information.

Loosen the lock nut and turn screw *in* to increase the pressure and *out* to decrease the pressure. When set, tighten the lock nut and retest.

Down Flow Control

The down flow control is adjusted by loosening the lock nut and turning the adjustment bolt *in* to increase the descent speed of the platform and *out* to decrease the descent speed. The descent speed should be 38 seconds from full extension to stowed position.

BRAKE ADJUSTMENT**NOTE**

Adjust brakes so that parking brake holds machine on an incline which it is capable of climbing. The machine is designed to have the brake on whenever it is not being driven.

1. Place platform in full down position.
2. Position unit with enough clearance to drive forward at least 12".
3. Locate guard panel at the rear of the unit directly above the fork lift pockets.
4. Remove guard panel using 1/2" wrench or ratchet.
5. Actuate control box drive switch to FORWARD, just far enough to manually lift the brake lock lever and engage into the lock notch.
6. Locate the brake adjustment holes within each panel side.
7. Using a brake adjustment tool (brake spoon), insert the flat blade into the hole and engage the sprocket (star wheel) adjusting teeth.

SPEED LIMIT SWITCH ADJUSTMENT

The speed limit switch (Figure 1-1) is actuated when the platform reaches a height of 7 feet. The switch sends a signal to the motor controller to apply slow speed when deactuated.

Adjustment is made with Platform in the fully down position with charger and charger plate removed.

1. With cams loose on beam pin and switches loose on bracket, slide cams over to line up with switch roller.

2. Turn cam so the switch roller is pushed in.
3. Push the switch as close to the cam as possible and tighten switch to bracket.
4. Turn cam so the switch roller is centered in the notch of the cam and tighten bolt.

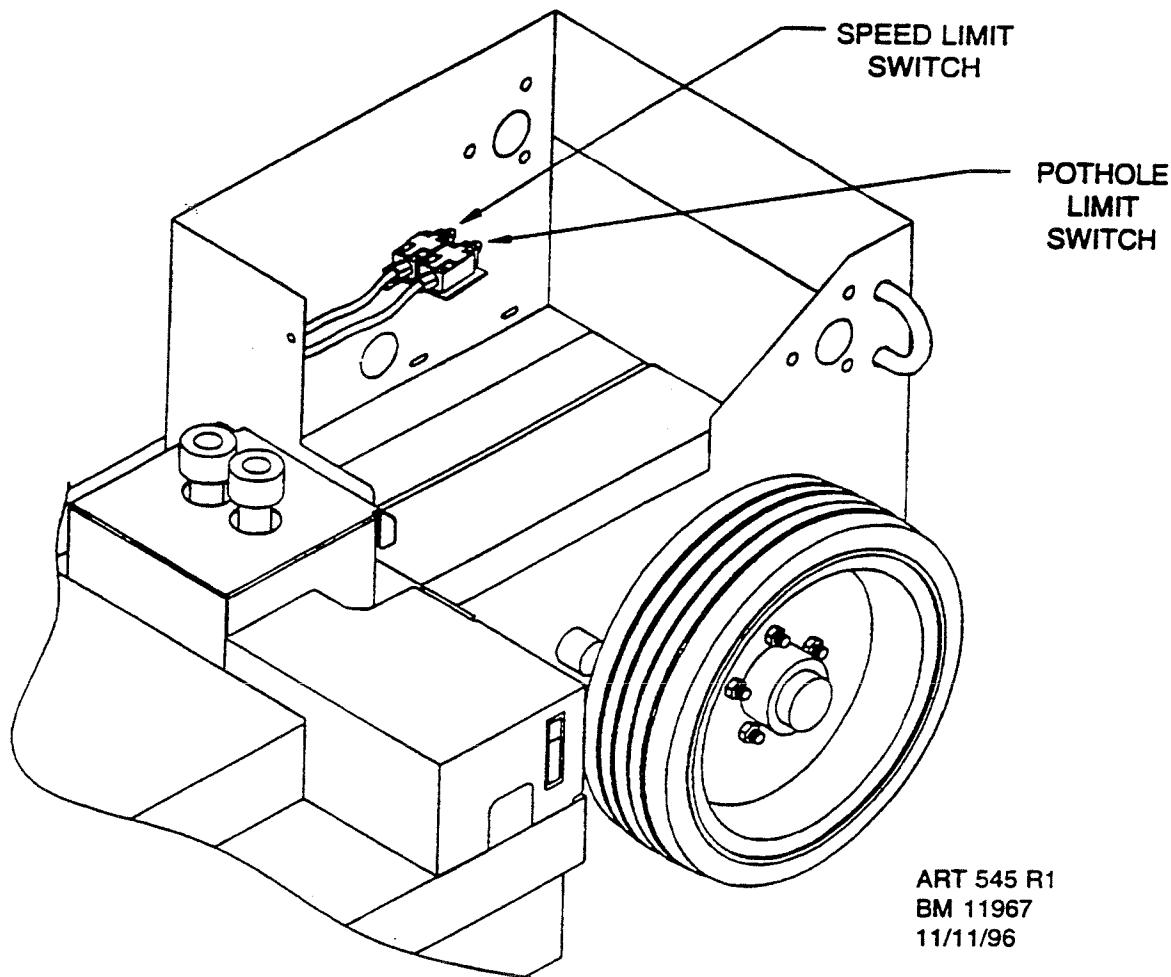
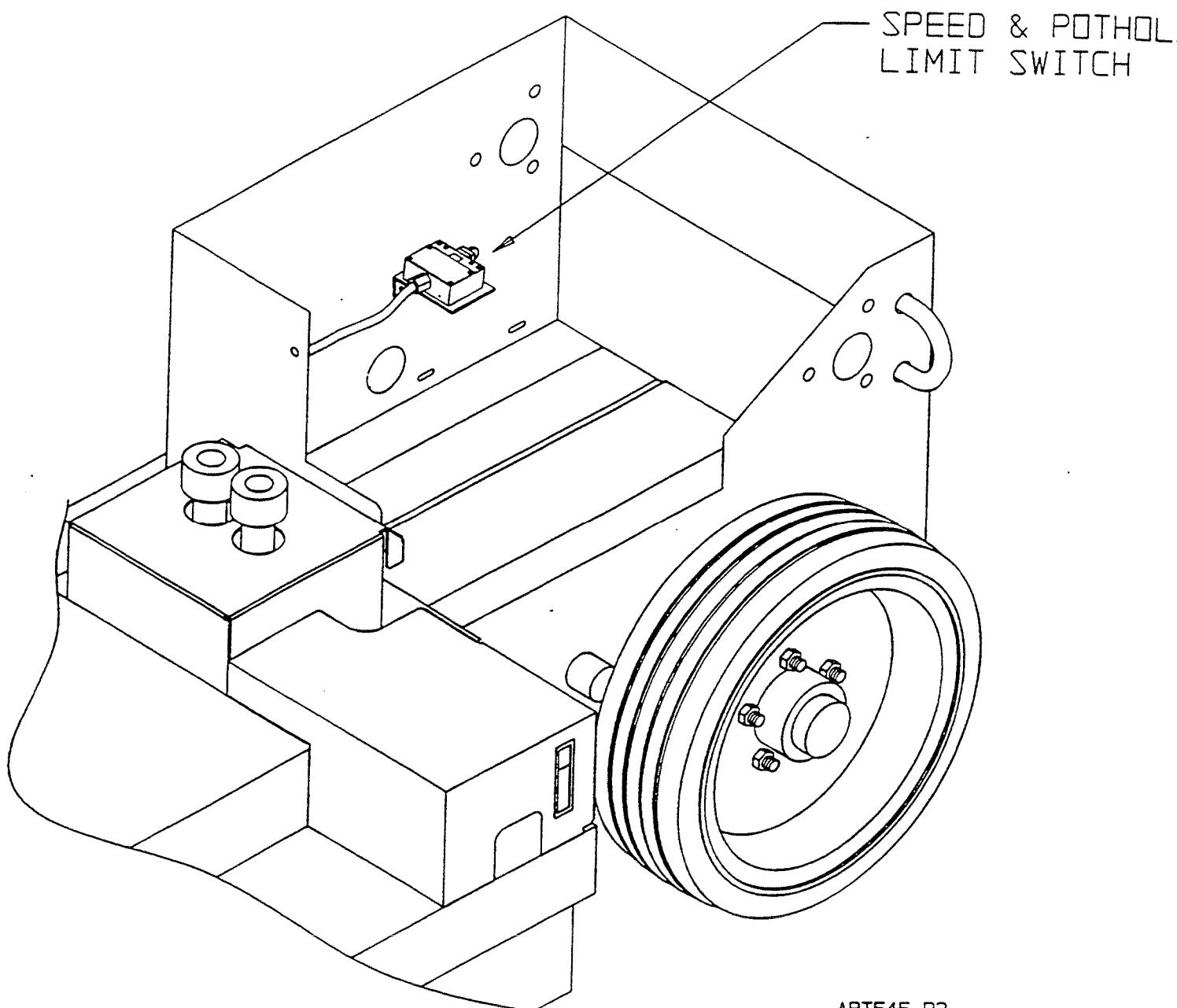


Figure 1-1. Speed and Pothole Limit Switches

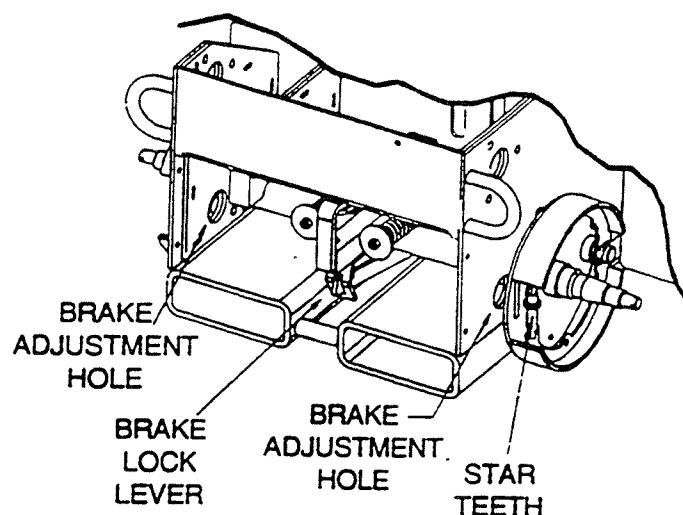


ART545 R2
BM11967
5/17/97

Figure 1-1. Speed Limit Switch

8. To tighten brake adjustments, turn left side star teeth to the front and right side teeth to the rear. Adjust for approximately 3/8 inch of return travel on each brake spring cylinder. Both left and right side spring pull bar should be equal in travel.
9. To test, drive the unit (forward or reverse) at full speed and then fully release the joystick drive handle.
10. Measure the distance the unit coasts before it comes to a complete stop. It should be approximately 12-18 inches.
11. If fine tuning is required, adjust in 2 click increments.
12. Reinstall the rear guard panel.

NOTE
If brakes require servicing, refer to dealer.



ART 412 R1
BM 5963
7/30/96

Figure 1-2. Brake Adjustment

GENERAL TROUBLESHOOTING

The Mayville 2033ES is an electric-over-hydraulic operated unit. Therefore, the first step when troubleshooting or repairing a functional defect is to check the electrical side of the system and make sure it is functioning properly. Check that all wiring is in good condition and all terminations are secure and making a good contact. Check that all switches, especially limit switches, are in place and functioning properly.

The Mayville 2033ES electrical system is numbered for identification. The numbering system is based on the terminal strip. All wires going through terminal (1) will be marked as number one (1).

ELECTRICAL AND HYDRAULIC DIAGRAMS

Electrical and Hydraulic diagrams are provided as Figures 2-1, 2-2, and 2-3. The diagrams are drawn with the unit in the stowed position, and with no functions actuated. These diagrams are furnished to help a well trained millwright or maintenance person diagnose an undesired condition.

The switches are depicted in the electrical diagram as seen from the rear of the switch. Dashed line(s) denotes internal contacts.

Illustrations of each of the manifolds are presented

following the hydraulic diagram to aid in identifying the individual valves for servicing. The pressures listed in the hydraulic diagram are taken at the test plug point in the hydraulic system.

MOTOR CONTROLLED LED DIAGNOSTIC SYSTEM

The Mayville 2033ES is equipped with a motor controller which is monitored by an LED diagnostic system. The LED diagnostic system (Figure 2-1) is located within the upper component compartment located on the right hand side of the unit. Release the panel latches and remove the panel for access to the diagnostic system.

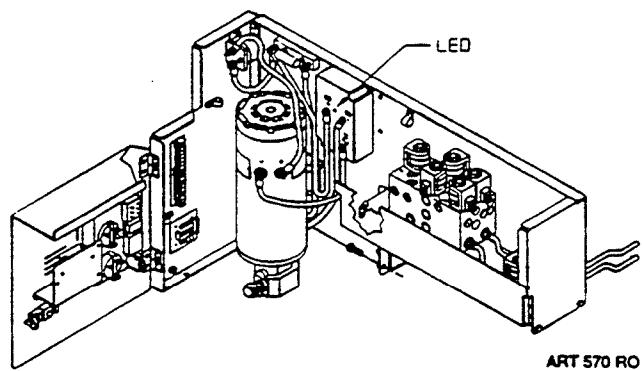


Figure 2-1. LED Diagnostics

The number of flashes from the green LED light signals potential problems. See Table 2-1 for specific diagnostic information.

Table 2-1. LED Diagnostics Definitions

LED READING	DIAGNOSIS
1. LED on	Controller is operational
2. LED off	Internal fault
3. 2 flashes	Procedure fault: A) DIRECTION, ENABLE BAR, STEER or LIFT selected at power on. B) DIRECTION, LIFT or STEER selected without ENABLE BAR. C) ENABLE BAR NEUTRAL 5 second time out. Recycle through NEUTRAL to clear.
4. 3 flashes	Motor shorted internally/externally: This includes MOSFET short circuit. This fault shuts down all modes. Recycle through NEUTRAL to clear after repairing shorted motor or controller.

Table 2-1. LED Diagnostics Definitions - Continued

LED READING	DIAGNOSIS
5. 4 flashes	<p>Motor open circuit: This includes MOTOR line contactor welded. This fault shuts down all modes.</p> <p>Key switch recycle to clear. Replace motor or contactor.</p>
6. 5 flashes	<p>Motor neither shorted or open circuit: This includes MOTOR contactor open circuit, MOSFET open circuit and hardware fail-safe trip. This fault shuts down all modes.</p> <p>Key switch recycle to clear. Replace motor, contactor or controller.</p>
7. 6 flashes	<p>Faulty TRACTION accelerator: This includes TRACTION accelerator greater than 15% at power on, and wire off. If wire off occurs during active function, motor speed will default to accelerator fault creep.</p>
8. 7 flashes	<p>Battery voltage fault: This includes battery voltage below 12 volts or exceeds 45 volts.</p> <p>NEUTRAL recycle to clear.</p>
9. 8 flashes	<p>Thermal cutback: This includes MOSFET temperature above 176° F (80° C).</p>
10. 9 flashes	<p>Battery voltage at or below 18 volt fault: This will open the LIFT UP contactor.</p> <p>NEUTRAL recycle to clear.</p>

SERVICE HELPS

If unit is not functioning, check the following items BEFORE calling a service technician:

1. Battery disconnect is pushed in.
2. Key switch is turned on.
3. Circuit breaker is reset.
4. Emergency stop switch is on (base and platform).
5. 20 Amp ground fuse is operational.
6. 200 Amp fuse is operational.
7. Enable bar is being held in.

ALWAYS check the above items before continuing. The following Troubleshooting Table assumes all of these items have been checked and are functioning properly.

The troubleshooting sequence in the table is presented in a logical order beginning with the most likely and ending with the least likely.

Perform tests for all possible defects to determine the proper input and output of each component. If the result is not satisfactory, reference the probable solution category.

Table 2-2. Troubleshooting Table

PROBLEM	POSSIBLE DEFECT	PROBABLE SOLUTION
1. Motor does not run on any one or more functions.	A. Defective enable switch. B. Defective motor contactor. C. Defective diode board. D. Defective motor controller. E. Faulty wiring to/from component. F. Defective electric motor.	A. Replace enable switch. B. Replace motor contactor. C. Replace diode board. D. Replace motor controller. E. Repair wiring. F. Replace electric motor.
2. Motor runs, but functions are inoperative.	A. Low oil level. B. Defective hydraulic pump. C. Mis-adjusted main relief valve. D. Defective main relief valve. E. Faulty wiring to operating switches.	A. Add oil. B. Replace hydraulic pump. C. Adjust valve. See Chapter 2, Specifications Section of Operation and Safety Manual D. Replace main relief valve. E. Repair wiring.
3. Unit does not steer.	A. Defective steering switch(es). B. Defective steering valve coil(s). C. Defective steering valve(s). D. Defective diode board. E. Defective motor controller. F. Faulty wiring to/from steering circuit.	A. Replace steering switch(es). B. Replace steering valve coil(s). C. Replace steering valve(s). D. Replace diode board. E. Replace motor controller. F. Repair wiring.
4. Unit does not drive (forward, reverse or both directions).	A. Defective drive switch(es). B. Defective mode switch. C. Defective drive valve coil(s). D. Defective drive valve(s). E. Defective brake valve coil. F. Defective brake valve. G. Faulty brake cylinder packings. H. Defective counter balance valve. I. Defective diode board. J. Defective motor controller. K. Faulty wiring to/from drive circuit. L. Defective control potentiometer. M. Defective hydraulic drive motor(s). N. Defective pothole limit switch(es). (3 total) O. Misadjusted pothole limit switch(es).	A. Replace drive switch(es). B. Replace mode switch. C. Replace drive valve coil(s). D. Replace drive valve(s). E. Replace brake valve coil. F. Replace brake valve. G. Replace brake cylinder packings. H. Replace counter balance valve. I. Replace diode board. J. Replace motor controller. K. Repair wiring. L. Replace control potentiometer. M. Replace hydraulic drive motor(s). N. Replace pothole switch(es). O. Readjust pothole limit switch(es).
5. Torque function inoperative.	A. Platform elevated above 7 feet. B. Speed limit switch misadjusted. C. Defective torque switch. D. Defective torque valve coil(s). E. Defective torque valve(s). F. Defective flow divider. G. Faulty wiring to/from torque circuit.	A. Lower platform to stowed position. B. Readjust speed limit switch. C. Replace torque switch. D. Replace torque valve coil(s). E. Replace torque valve(s). F. Replace flow divider. G. Repair wiring.

Table 2-2. Troubleshooting Table - Continued

PROBLEM	POSSIBLE DEFECT	PROBABLE SOLUTION
6. Platform will not lift.	A. Platform load exceeds capacity rating. B. Defective base lift/lower switch. C. Defective platform lift switch. D. Defective mode select switch. E. Defective lift valve coil. F. Defective lift valve. G. Defective diode board. H. Defective motor controller. I. Misadjusted lift relief valve. J. Defective lift relief valve. K. Defective manifold velocity fuse. L. Defective down valve. M. Defective lift cylinder velocity fuse. N. Defective lift cylinder packings. O. Faulty wiring to/from lift circuit. P. Defective control potentiometer. Q. Structural damage.	A. Reduce load weight. B. Replace base lift/lower switch. C. Replace platform lift switch. D. Replace mode select switch. E. Replace lift valve coil. F. Replace lift valve. G. Replace diode board. H. Replace motor controller. I. Adjust valve. See Table 2-4, Specifications of Operating and Safety Manual. J. Replace and readjust lift relief valve. K. Replace manifold velocity fuse. L. Replace down valve. M. Replace lift cylinder velocity fuse. N. Replace lift cylinder packings. O. Repair wiring. P. Replace control potentiometer. Q. Consult factory.
7. Platform will not lower.	A. Defective lowering valve coil. B. Defective lowering valve. C. Defective platform lowering switch. D. Defective base lift/lower switch. E. Defective mode select switch. F. Faulty wiring to/from lowering circuit.	A. Replace lowering valve coil. B. Replace lowering valve. C. Replace platform lowering switch. D. Replace base lift/lower switch. E. Replace mode select switch. F. Repair wiring.
8. Platform "drifts" down.	A. Defective down valve. B. Defective cylinder packings.	A. Clean or replace down valve. B. Replace cylinder packings.
9. Optional DC/AC converter does not activate power tool(s).	A. Variable speed equipment does not activate.	A. Plug in a trouble light to provide a constant current draw.

NOTES



2033ES ELECTRICAL SCHEMATIC

SERIAL #8800101 THROUGH #8802623

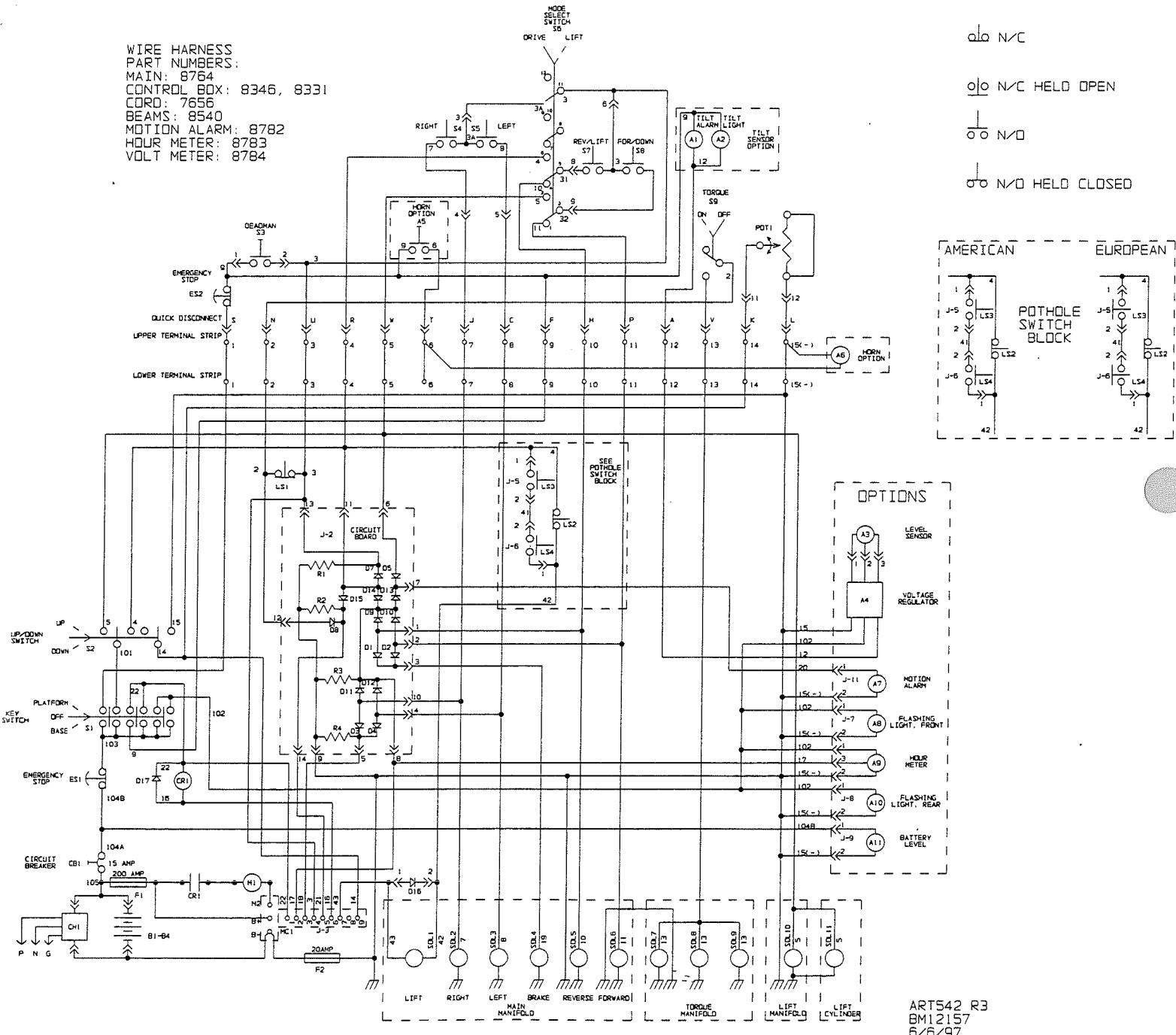


Figure 2-2. 2033ES Electrical Schematic

OTES: (UNLESS OTHERWISE SPECIFIED)

1. SWITCH S1 "KEY SWITCH" MAKES CONTACT TO THE RIGHT SET OF CONTACTS WHEN THE SWITCH IS PLACED IN THE BASE POSITION.
2. SWITCH S2 "UP/DOWN SWITCH" MAKES CONTACT FROM THE CENTER TO THE LEFT WHEN THE SWITCH IS HELD IS THE DOWN POSITION.
3. SWITCH LS1, AND LS2 GOES FROM N/C TO N/O WHEN THE PLATFORM REACHES 7FEET.
4. SWITCH LS3 GOES FROM N/O TO N/C WHEN THE LEFT POTHOLE BAR IS LOWERED COMPLETELY.
5. SWITCH LS4 GOES FROM N/O TO N/C WHEN THE RIGHT POTHOLE BAR IS LOWERED COMPLETELY.
6. UNIT SHOWN IN STORED POSITION WITH POTHOLE BAR IN UP POSITION.

ITEM	PART NO.	QTY.	DESCRIPTION	FUNCTION	LOCATION
A1-A4	13512	1	TILT SENSOR OPTION PACKAGE	WARN WHEN MACHINE IS AT 4 DEG.	UNDER CHARGER & IN CONTROL BOX
A5-A6	13764	1	PLATFORM MOUNTED HORN PACKAGE	OPERATOR ACTIVATED HORN	CONTROL BOX AND UNDER PLATEFORM
A7	13656	1	MOTION ALARM PACKAGE	WARN OF A MOVEMENT	BEHIND LOWER CONTROL PANEL
A8,A10	13431	2	FLASHING LIGHT PACKAGE	WARN OF A POWERED UP MACHINE	NEXT TO TANK, NEXT TO CHARGER
A9	13655	1	HOUR METER PACKAGE	RECORD TIME THAT IS MACHINE IS BEING USED	LOWER CONTROL PANEL
A11	13654	1	BATTERY INDICATOR PACKAGE	SHOW BATTERY STATUS	LOWER CONTROL PANEL
B1-B4	XXXX	4	6 VOLT DEEP CYCLE BATTERY	POWER FOR THE MOTOR AND CONTROL CIRCUIT	INSIDE BATTERY COMPARTMENT
CBI	7235	1	CIRCUIT BREAKER - 15 AMP MANUAL	CONTROL CIRCUIT PROTECTION	LOWER CONTROL PANEL
CRI	5967	1	24 VOLT CONTACTOR	ALLOW MOTOR TO TURN ON	MOTOR CABINET
DI-D15	8601	1	CIRCUIT BOARD FOR UNITS W/ SEVCON	DIRECT SIGNALS TO THE PROPER LOCATION	MOTOR CABINET NEAR TERM. STRIP
RI-R4					
D16	8480	1	PLUG-IN DIODE PACK	SUPPRESSION DIODE	HAIN MANIFOLD LIFT VALVE
D17	8368	1	DIODE W/ RING TERMINALS	SUPPRESSION DIODE	ACROSS CONTACTOR COIL
E\$1	7800	1	SWITCH, EMERGENCY STOP	SHUTDOWN ALL MOVING FUNCTIONS	LOWER CONTROL PANEL
E\$2	7800	1	SWITCH, EMERGENCY STOP	SHUTDOWN ALL PLATFORM MOVING FUNCTIONS	UPPER CONTROL BOX
F1	8344	1	FUSE, 200 AMP	MAIN LINE FUSE	MOTOR CABINET
F2	7275	1	FUSE, 20 AMP SERVICE PACK	CONTROL GROUND FUSE	MOTOR CABINET
L\$1	8776	1	SWITCH, LIMIT	ENABLE HIGH SPEED	UNDER CHARGER
L\$2	8776	1	SWITCH, LIMIT	DETCT POTHOLE BAR LOCATION	UNDER CHARGER
L\$3-EUR	8776	1	SWITCH, LIMIT	DETCT POTHOLE BAR LOCATION	UNDER CHARGER
L\$3-AME	8696	1	SWITCH, LIMIT V7	DETCT POTHOLE BAR LOCATION	NEAR POTHOLE LEVERS
L\$4-EUR	8776	1	SWITCH, LIMIT	DETCT POTHOLE BAR LOCATION	UNDER CHARGER
L\$4-AME	8696	1	SWITCH, LIMIT V7	DETCT POTHOLE BAR LOCATION	NEAR POTHOLE LEVERS
H1	8544	1	MOTOR 24 VOLI, 2 HP	TURN THE HYDRAULIC PUMP	MOTOR CABINET
HCI	8539	1	CONTROLLER, DC 250 AMP POTI	CHANGES THE MOTOR SPEED	MOTOR CABINET
I	13527	1	POTENIOMETER, 20K OHMS	SENSES THE OPERATOR INPUT	UPPER CONTROL BOX
S1	8787	1	SWITCH, KEY	ALLOWS BASE OR PLATFORM CONTROLS TO BE USED	LOWER CONTROL PANEL
S2	5694	1	SWITCH, TOGGLE 2 POLE 3 POS.	ALLOWS LIFT/LOWER FUNCTIONS AT BASE CONTROLS	LOWER CONTROL PANEL
S3	8753	1	SWITCH, PUSH-BUTTON	ENABLES OTHER FUNCTION TO BE USED AT PLATFORM	UPPER CONTROL BOX, HANDLE
S4	8448	1	SWITCH, LIMIT V3	RIGHT TURN SWITCH	UPPER CONTROL BOX, HANDLE
S5	8448	1	SWITCH, LIMIT V3	LEFT TURN SWITCH	UPPER CONTROL BOX, HANDLE
S6	8638	1	SWITCH, TOGGLE 4 POLE 2 POS.	ALLOW EITHER LIFT OR DRIVE FUNCTIONS	UPPER CONTROL BOX
S7	8696	1	SWITCH, LIMIT V7	REVERSE OR LIFT SWITCH	UPPER CONTROL BOX
S8	8696	1	SWITCH, LIMIT V7	FURWARD OR DOWN SWITCH	UPPER CONTROL BOX
S9	5630	1	SWITCH, TOGGLE 1 POLE 2 POS	TORQUE SWITCH	UPPER CONTROL BOX
SOL 1	7833	1	COIL, 24 VOLI 2 SPADE	ACTIVATES LIFT VALVE	HAIN MANIFOLD
SOL 2	6163	1	COIL, 24 VOLI SINGLE SPADE	ACTIVATES RIGHT TURN VALVE	HAIN MANIFOLD
SOL 3	6163	1	COIL, 24 VOLI SINGLE SPADE	ACTIVATES LEFT TURN VALVE	HAIN MANIFOLD
SOL 4	6163	1	COIL, 24 VOLI SINGLE SPADE	ACTIVATES BRAKE VALVE	HAIN MANIFOLD
SOL 5	6163	1	COIL, 24 VOLI SINGLE SPADE	ACTIVATES REVERSE	HAIN MANIFOLD
SOL 6	6163	1	COIL, 24 VOLI SINGLE SPADE	ACTIVATES FORWARD	HAIN MANIFOLD
SOL 7,8,9	6163	3	COIL, 24 VOLI SINGLE SPADE	ACTIVATES TORQUE VALVES	TORQUE MANIFOLD
SOL 10	6163	1	COIL, 24 VOLI SINGLE SPADE	ACTIVATES DOWN VALVE	LIFT MANIFOLD
SOL 11	7833	1	COIL, 24 VOLI 2 SPADE	ACTIVATES DOWN VALVE	LIFT CYLINDER

Figure 2-2. 2033ES Electrical Schematic

ART542 R3
8M12157
6/97

2033ES ELECTRICAL SCHEMATIC

SERIAL #8802624 THROUGH PRESENT

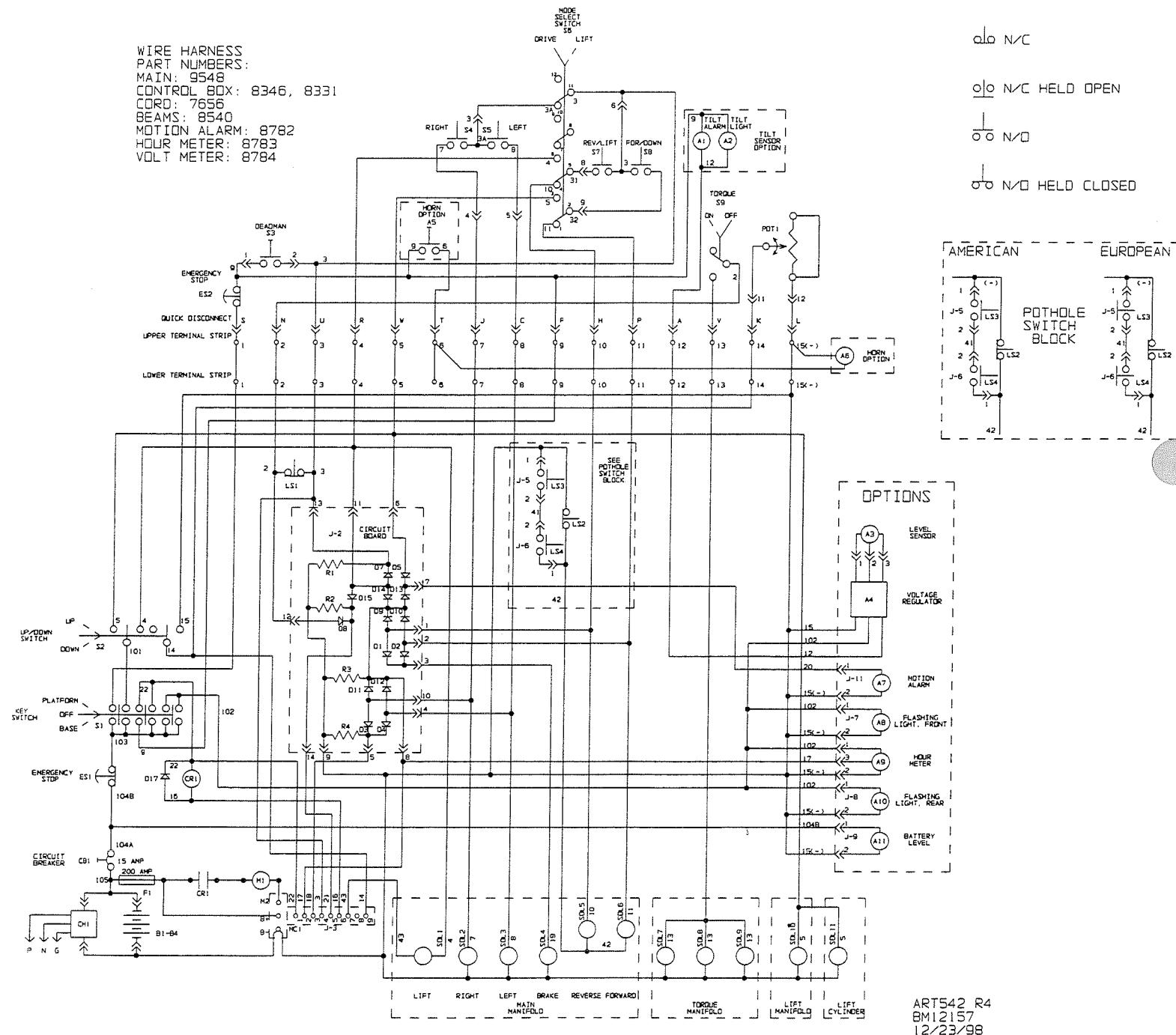


Figure 2-2a. 2033ES Electrical Schematic

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. SWITCH S1 "KEY SWITCH" MAKES CONTACT TO THE RIGHT SET OF CONTACTS WHEN THE SWITCH IS PLACED IN THE BASE POSITION.
2. SWITCH S2 "UP/DOWN SWITCH" MAKES CONTACT FROM THE CENTER TO THE LEFT WHEN THE SWITCH IS HELD IN THE DOWN POSITION.
3. SWITCH LS1, AND LS2 GOES FROM N/C TO N/O WHEN THE PLATFORM REACHES 7FEET.

4. SWITCH LS3 GOES FROM N/O TO N/C WHEN THE LEFT POTHOLE BAR IS LOWERED COMPLETELY.
5. SWITCH LS4 GOES FROM N/O TO N/C WHEN THE RIGHT POTHOLE BAR IS LOWERED COMPLETELY.
6. UNIT SHOWN IN STOWED POSITION WITH POTHOLE BAR IN UP POSITION.

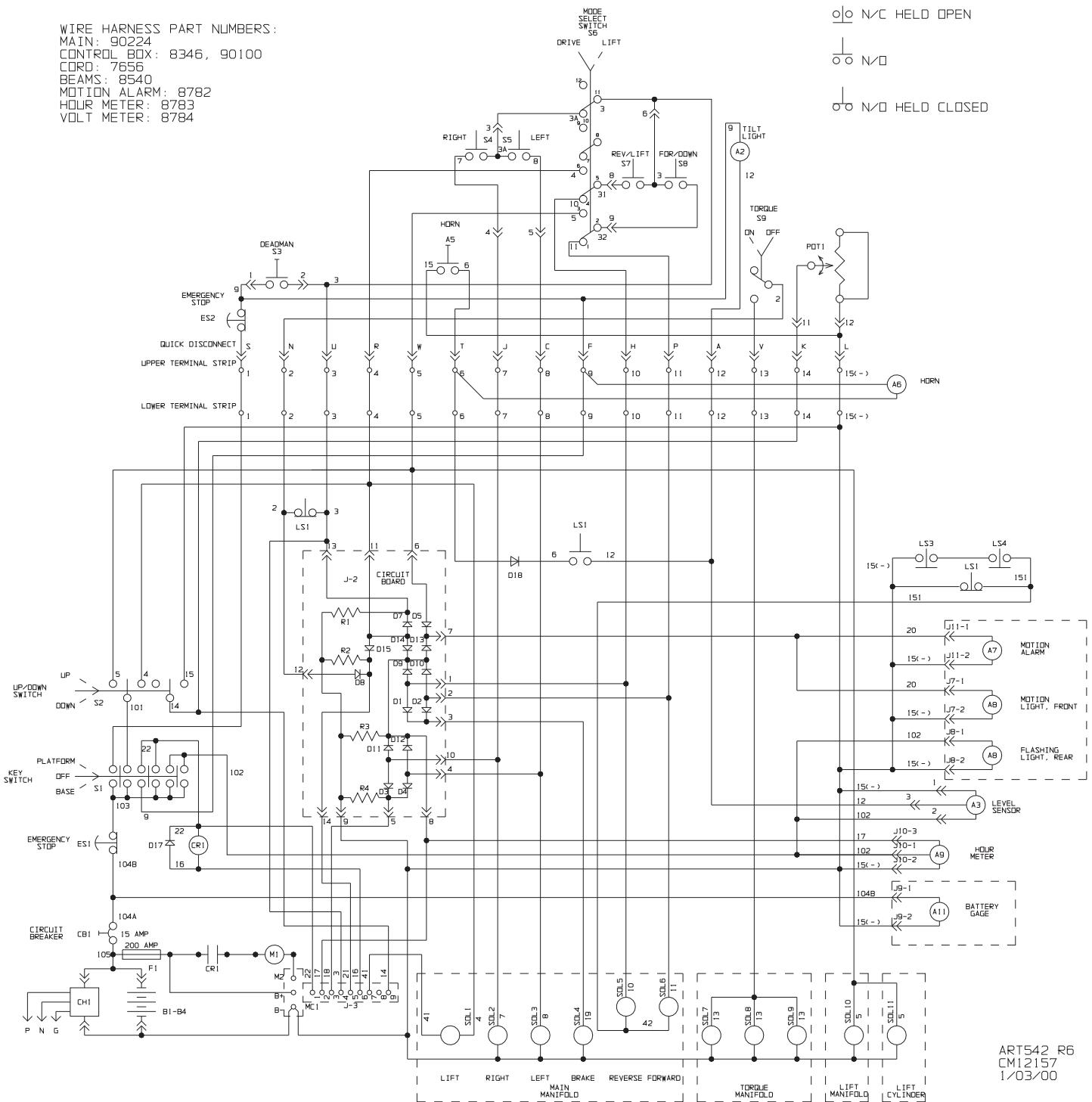
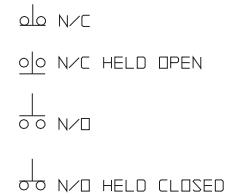
ITEM	PART NO.	QTY.	DESCRIPTION	FUNCTION	LOCATION
A1-A4	13512	1	TI LT SENSOR OPTION PACKAGE	WARN WHEN MACHINE IS AT 4 DEG.	UNDER CHARGER & IN CONTROL BOX
A5-A6	13784	1	PLATFORM MOUNTED HORN PACKAGE	OPERATOR ACTIVATED HORN	CONTROL BOX AND UNDER PLATFORM
A7	13856	1	MOTION ALARM PACKAGE	WARN OF A MOVEMENT	BEHIND LOWER CONTROL PANEL
A8,A10	13431	2	FLASHING LIGHT PACKAGE	WARN OF A POWERED UP MACHINE	NEXT TO TANK, NEXT TO CHARGER
A9	13855	1	HOUR METER PACKAGE	RECORD TIME THAT IS MACHINE IS BEING USED	LOWER CONTROL PANEL
A11	13854	1	BATTERY INDICATOR PACKAGE	SHOW BATTERY STATUS	LOWER CONTROL PANEL
B1-B4	XXXX	4	6 VOLT DEEP CYCLE BATTERY	POWER FOR THE MOTOR AND CONTROL CIRCUIT	INSIDE BATTERY COMPARTMENT
CBI	7235	1	CIRCUIT BREAKER - 15 AMP MANUAL	CONTROL CIRCUIT PROTECTION	LOWER CONTROL PANEL
CRI	5967	1	24 VOLT CONTACTOR	ALLOW MOTOR TO TURN ON	MOTOR CABINET
DI-D15	8601	1	CIRCUIT BOARD FOR UNITS W/ SEVCON	DIRECT SIGNALS TO THE PROPER LOCATION	MOTOR CABINET NEAR TERM. STRIP
R1-R4					
D17	8368	1	DIODE W/ RING TERMINALS	SUPPRESSON DIODE	ACROSS CONTACTOR COIL
E51	7800	1	SWITCH, EMERGENCY STOP	SHUTDOWN ALL MOVING FUNCTIONS	LOWER CONTROL PANEL
E52	7800	1	SWITCH, EMERGENCY STOP	SHUTDOWN ALL PLATFORM MOVING FUNCTIONS	UPPER CONTROL BOX
F1	8344	1	FUSE, 200 AMP	MAIN LINE FUSE	MOTOR CABINET
LS1	8776	1	SWITCH, LIMIT	ENABLE HIGH SPEED	UNDER CHARGER
LS2	8776	1	SWITCH, LIMIT	LIFT ENABLE	UNDER CHARGER
LS3-EUR	8776	1	SWITCH, LIMIT	DETECT POTHOLE BAR LOCATION	UNDER CHARGER
LS3-AME	8696	1	SWITCH, LIMIT V7	DETECT POTHOLE BAR LOCATION	NEAR POTHOLE LEVERS
LS4-EUR	8776	1	SWITCH, LIMIT	DETECT POTHOLE BAR LOCATION	UNDER CHARGER
LS4-AME	8696	1	SWITCH, LIMIT V7	DETECT POTHOLE BAR LOCATION	NEAR POTHOLE LEVERS
M1	8544	1	MOTOR 24 VOLT, 2 HP	TURN THE HYDRAULIC PUMP	MOTOR CABINET
MC1	8539	1	CONTROLLER, DC 250 AMP	CHANGES THE MOTOR SPEED	MOTOR CABINET
POT1	13527	1	POTOMETER, 20K OHMS	SENSES THE OPERATOR INPUT	UPPER CONTROL BOX
S1	8787	1	SWITCH, KEY	ALLOWS BASE OR PLATFORM CONTROLS TO BE USED	LOWER CONTROL PANEL
S2	5694	1	SWITCH, TOGGLE 2 POLE 3 POS.	ALLOWS LIFT/LOWER FUNCTIONS AT BASE CONTROLS	LOWER CONTROL PANEL
S3	8753	1	SWITCH, PUSH-BUTTON	ENABLES OTHER FUNCTION TO BE USED AT PLATFORM	UPPER CONTROL BOX, HANDLE
S4	8448	1	SWITCH, LIMIT V3	RIGHT TURN SWITCH	UPPER CONTROL BOX, HANDLE
S5	8448	1	SWITCH, LIMIT V3	LEFT TURN SWITCH	UPPER CONTROL BOX, HANDLE
S6	8638	1	SWITCH, TOGGLE 4 POLE 2 POS.	ALLOW EITHER LIFT OR DRIVE FUNCTIONS	UPPER CONTROL BOX, HANDLE
S7	8696	1	SWITCH, LIMIT V7	REVERSE OR LIFT SWITCH	UPPER CONTROL BOX
S8	8696	1	SWITCH, LIMIT V7	FORWARD OR DOWN SWITCH	UPPER CONTROL BOX
S9	5630	1	SWITCH, TOGGLE 1 POLE 2 POS.	TORQUE SWITCH	UPPER CONTROL BOX
SOL1	8914	1	COIL, 24 VOLT 2 SPADE	ACTIVATES LIFT VALVE	MAIN MANIFOLD
SOL2	8914	1	COIL, 24 VOLT SINGLE SPADE	ACTIVATES RIGHT TURN VALVE	MAIN MANIFOLD
SOL3	8914	1	COIL, 24 VOLT SINGLE SPADE	ACTIVATES LEFT TURN VALVE	MAIN MANIFOLD
SOL4	8914	1	COIL, 24 VOLT SINGLE SPADE	ACTIVATES BRAKE VALVE	MAIN MANIFOLD
SOL5	8914	1	COIL, 24 VOLT SINGLE SPADE	ACTIVATES REVERSE	MAIN MANIFOLD
SOL6	8914	1	COIL, 24 VOLT SINGLE SPADE	ACTIVATES FORWARD	MAIN MANIFOLD
SOL7,8,9	8914	3	COIL, 24 VOLT SINGLE SPADE	ACTIVATES TORQUE VALVES	TORQUE MANIFOLD
SOL10	6163	1	COIL, 24 VOLT SINGLE SPADE	ACTIVATES DOWN VALVE	LIFT MANIFOLD
SOL11	7833	1	COIL, 24 VOLT 2 SPADE	ACTIVATES DOWN VALVE	LIFT CYLINDER

Figure 2-2a. 2033ES Electrical Schematic

2033ES ELECTRICAL SCHEMATIC

8803214-8803999

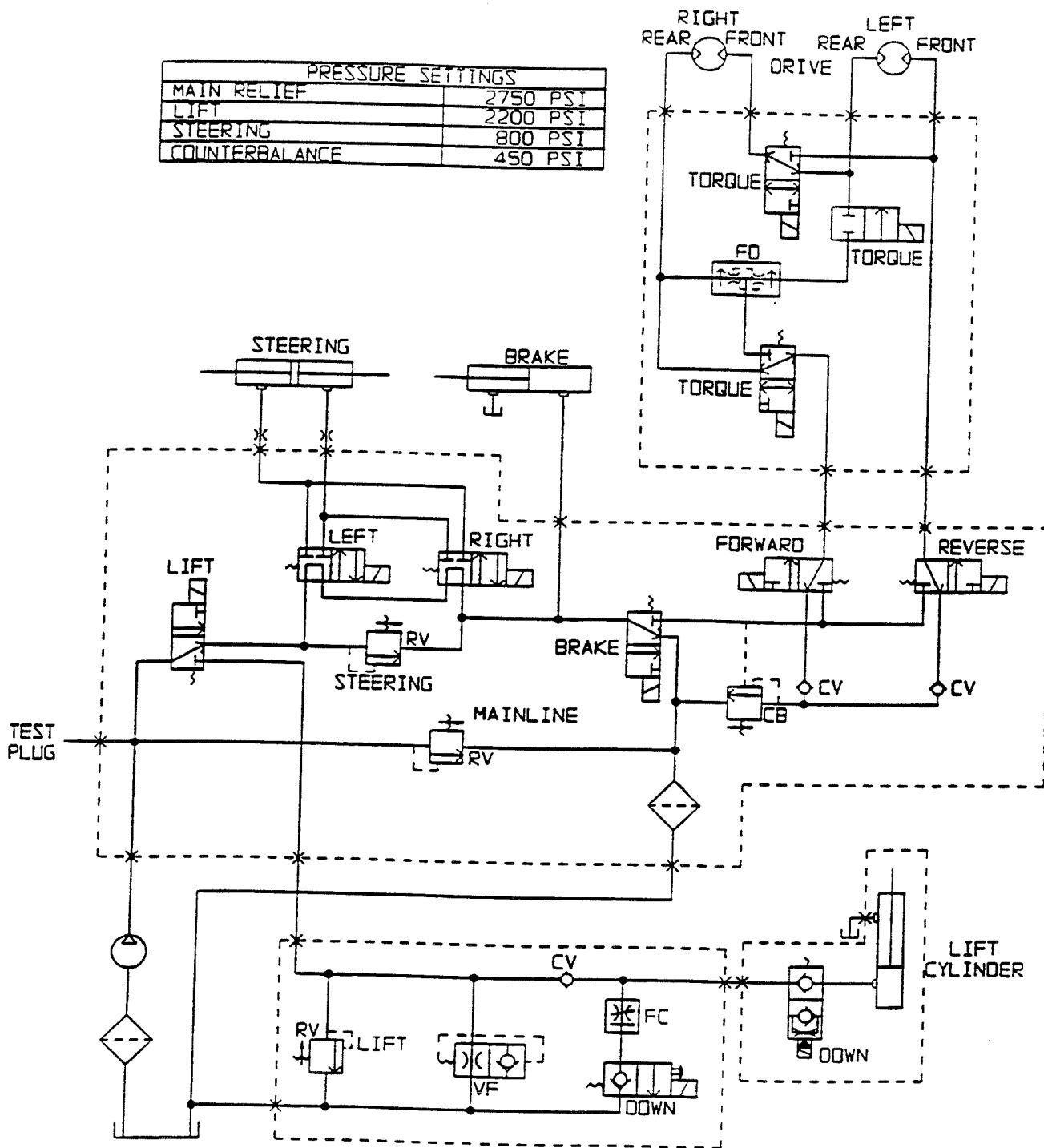
WIRE HARNESS PART NUMBERS:
 MAIN: 90224
 CONTROL BOX: 8346, 90100
 CORD: 7656
 BEAMS: 8540
 MOTION ALARM: 8782
 HOUR METER: 8783
 VOLT METER: 8784



NOTES: (UNLESS OTHERWISE SPECIFIED)

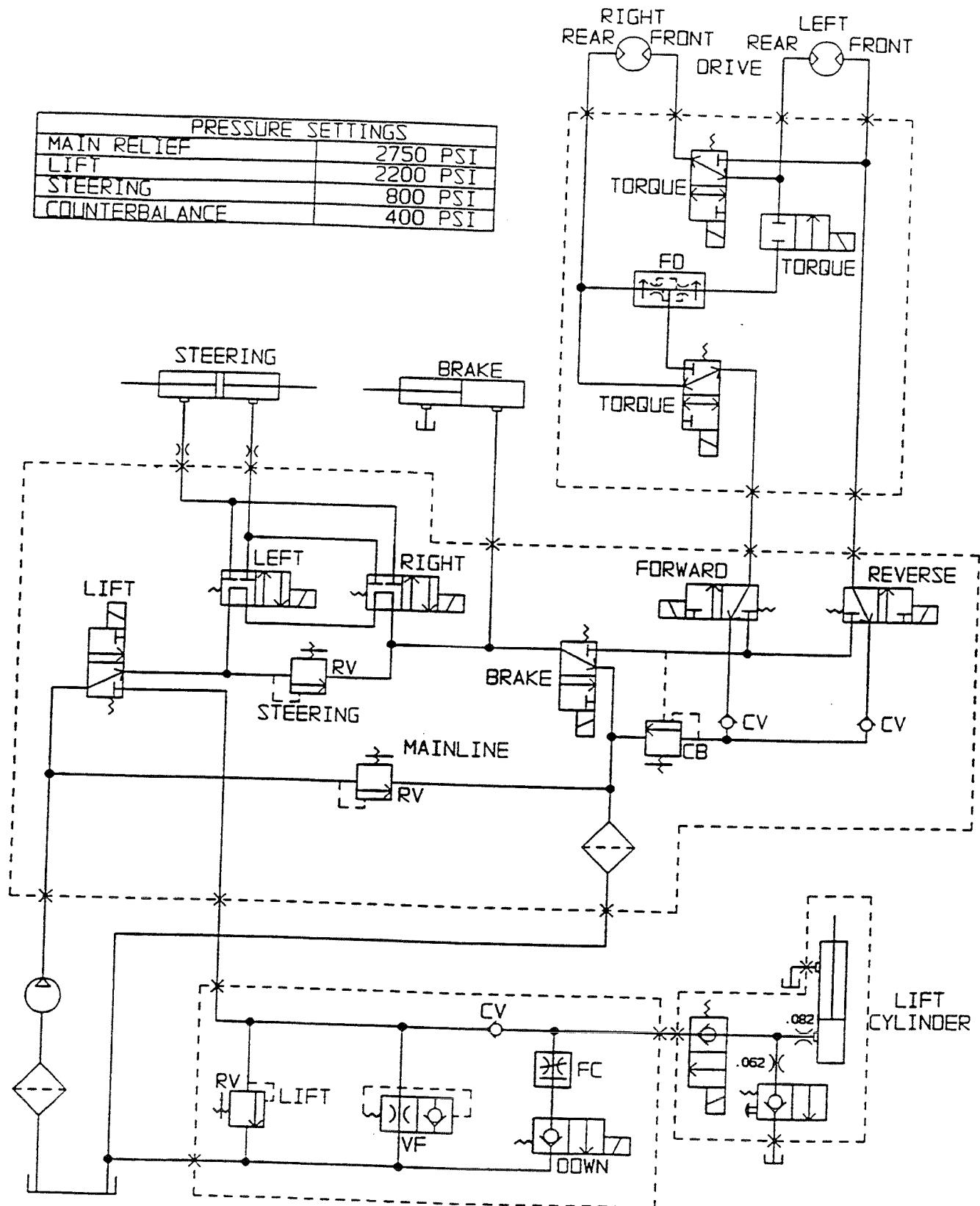
- SWITCH S1 "KEY SWITCH" MAKES CONTACT TO THE RIGHT SET OF CONTACTS WHEN THE SWITCH IS PLACED IN THE BASE POSITION.
- SWITCH S2 "UP/DOWN SWITCH" MAKES CONTACT FROM THE CENTER TO THE LEFT WHEN THE SWITCH IS HELD IN THE DOWN POSITION.
- SWITCH LS1 GOES FROM N/C TO N/O WHEN THE PLATFORM REACHES 7 FEET.
- SWITCH LS3 GOES FROM N/O TO N/C WHEN THE LEFT POTHOLE BAR IS LOWERED COMPLETELY.
- SWITCH LS4 GOES FROM N/O TO N/C WHEN THE RIGHT POTHOLE BAR IS LOWERED COMPLETELY.
- UNIT SHOWN IN STOWED POSITION WITH POTHOLE BAR IN UP POSITION.

ART542 R6
 CM12157
 1/03/00



ART 562 R2
8M12307
7/24/97

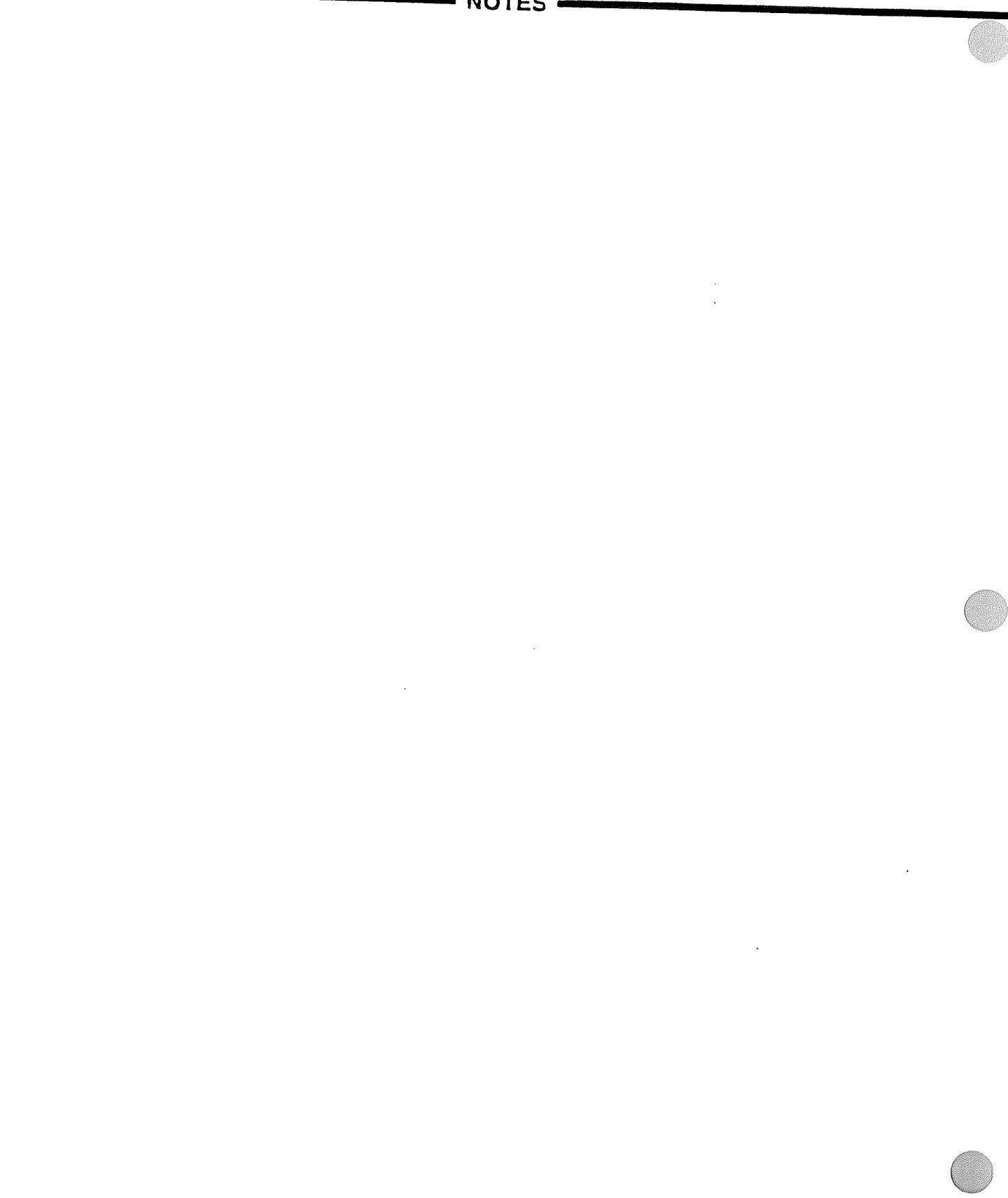
Figure 2-3 2033ES Hydraulic Assembly



ART563 R2
BM12308
3/24/97

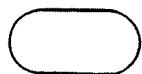
Figure 2-4. 2033ES Hydraulic Schematic - Europe

NOTES

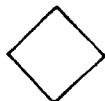


2033ES TROUBLESHOOTING

SYMBOL IDENTIFICATION



BEGINNING OR END



DECISION



PROCESS



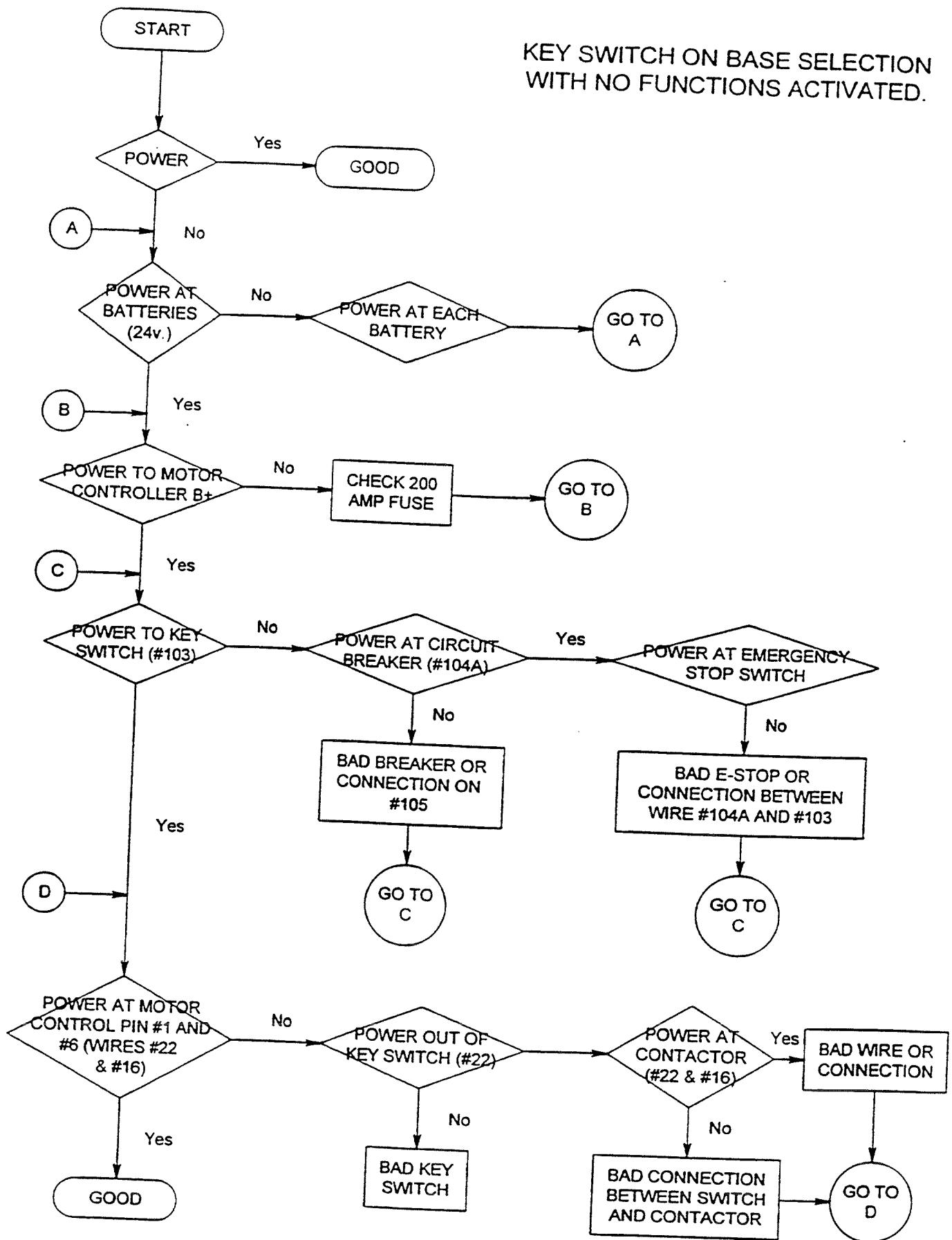
CONNECTOR

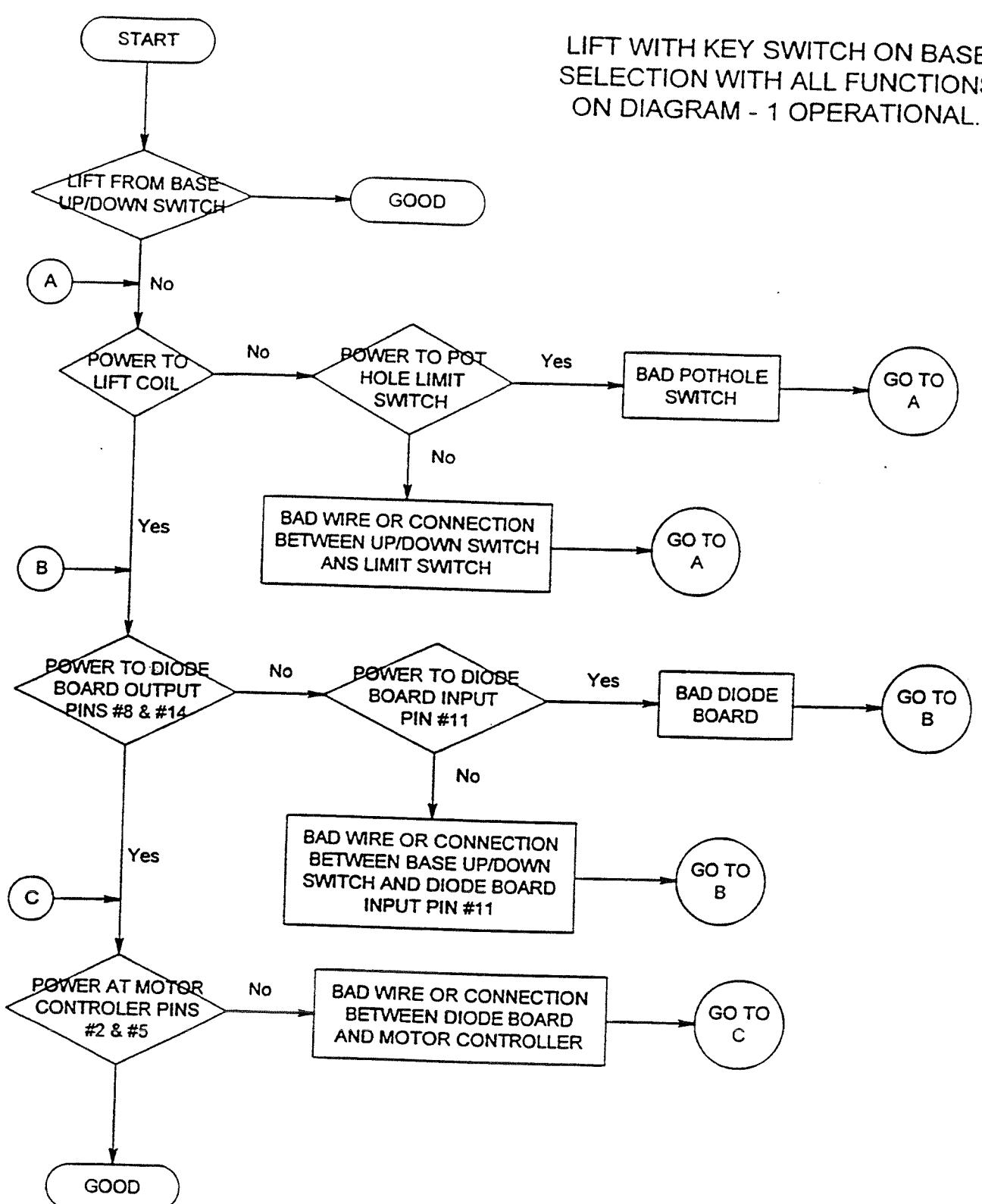


DIRECTION ARROW

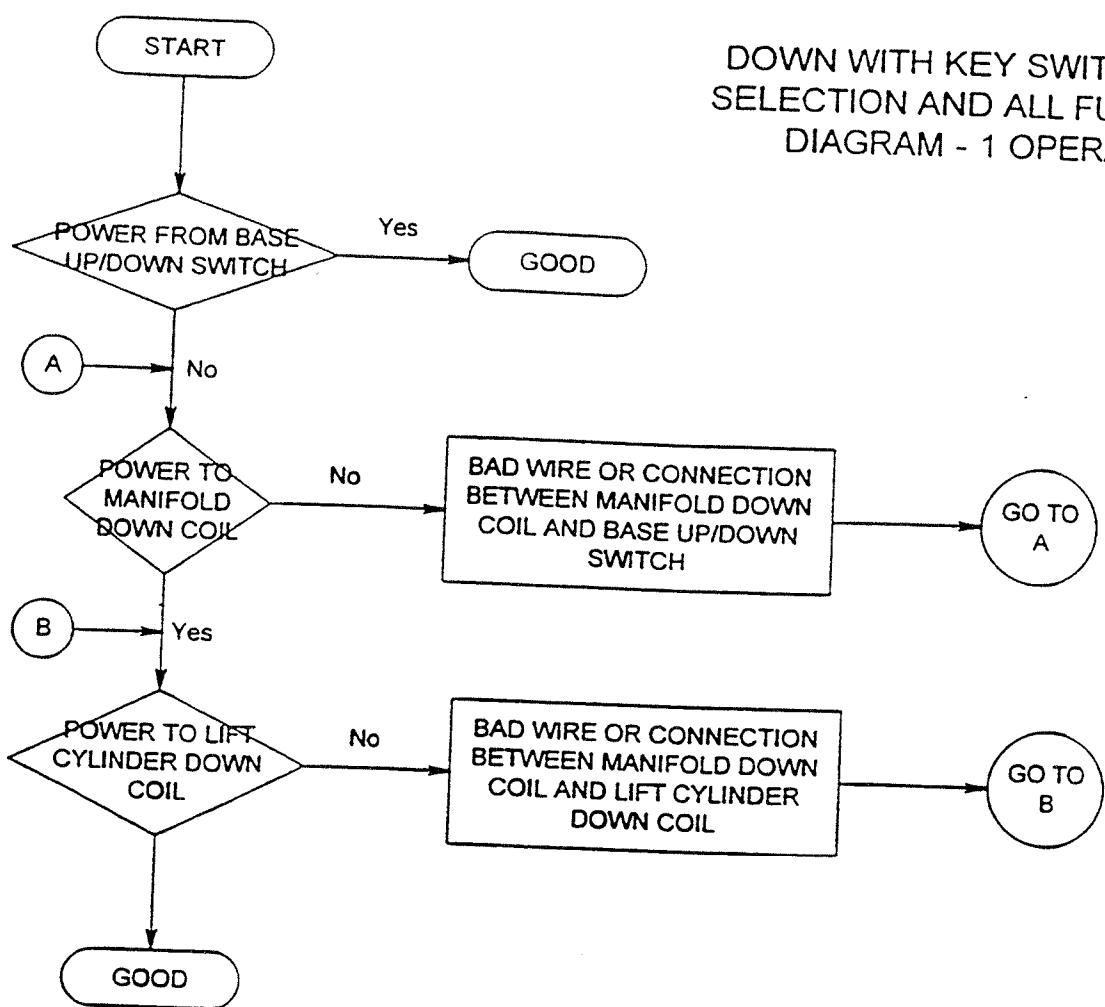


PAGE CONNECTOR



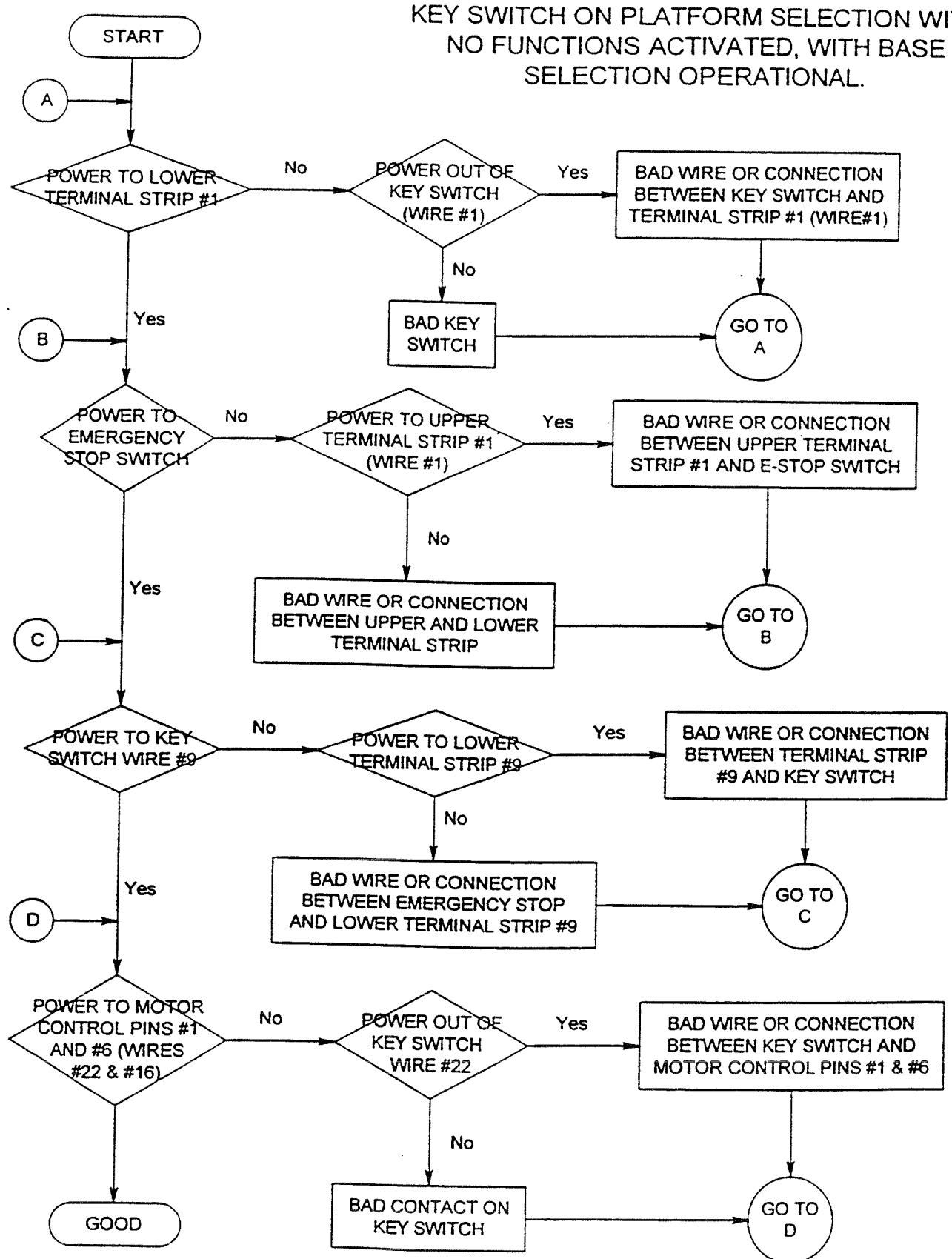


NOTE: LIFT COIL MUST HAVE MORE THAN 18.1v.
THE MOTOR CONTROLLER HAS AN 18v LIFT CUT
OUT

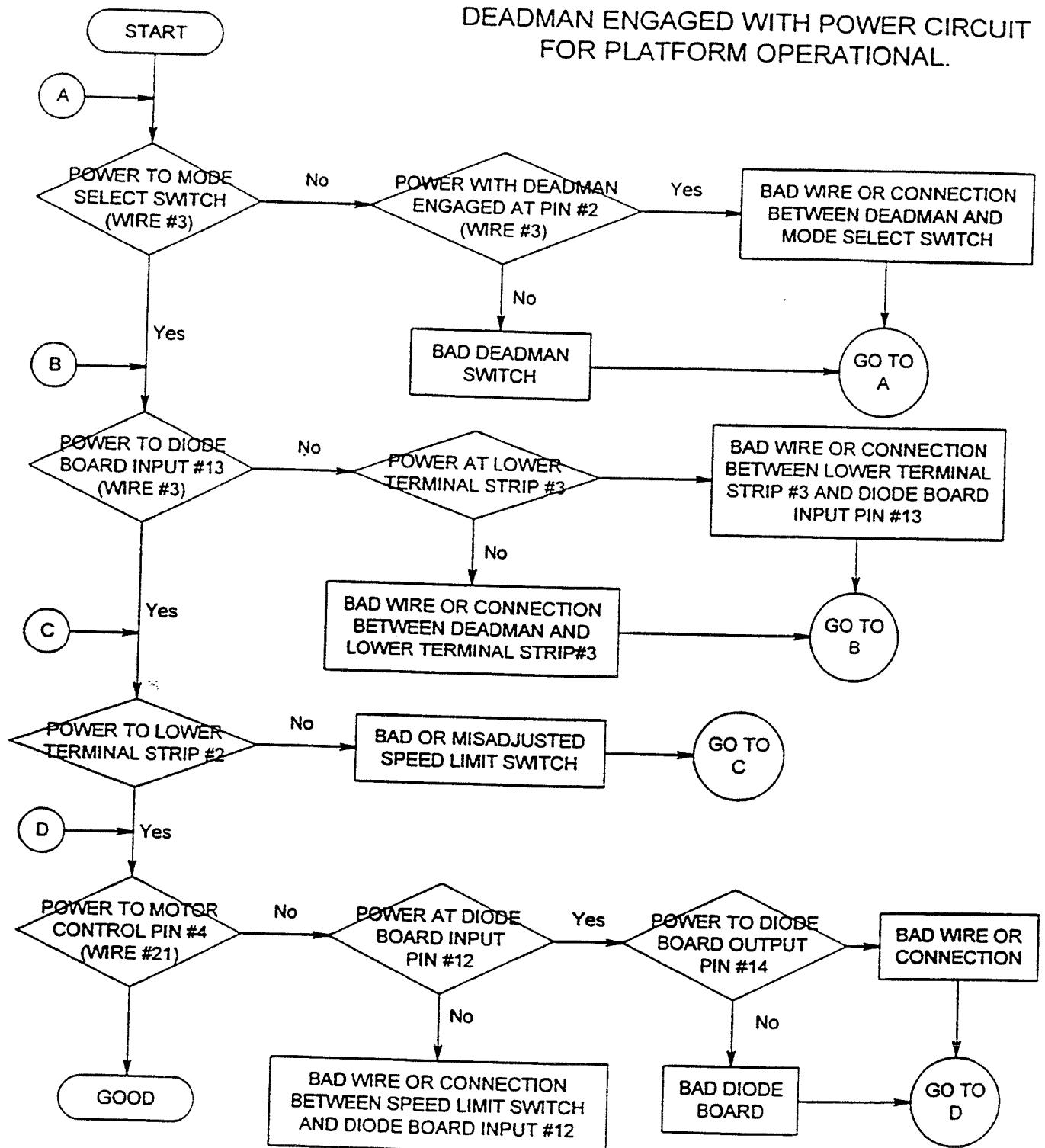


DOWN WITH KEY SWITCH ON BASE
SELECTION AND ALL FUNCTIONS ON
DIAGRAM - 1 OPERATIONAL.

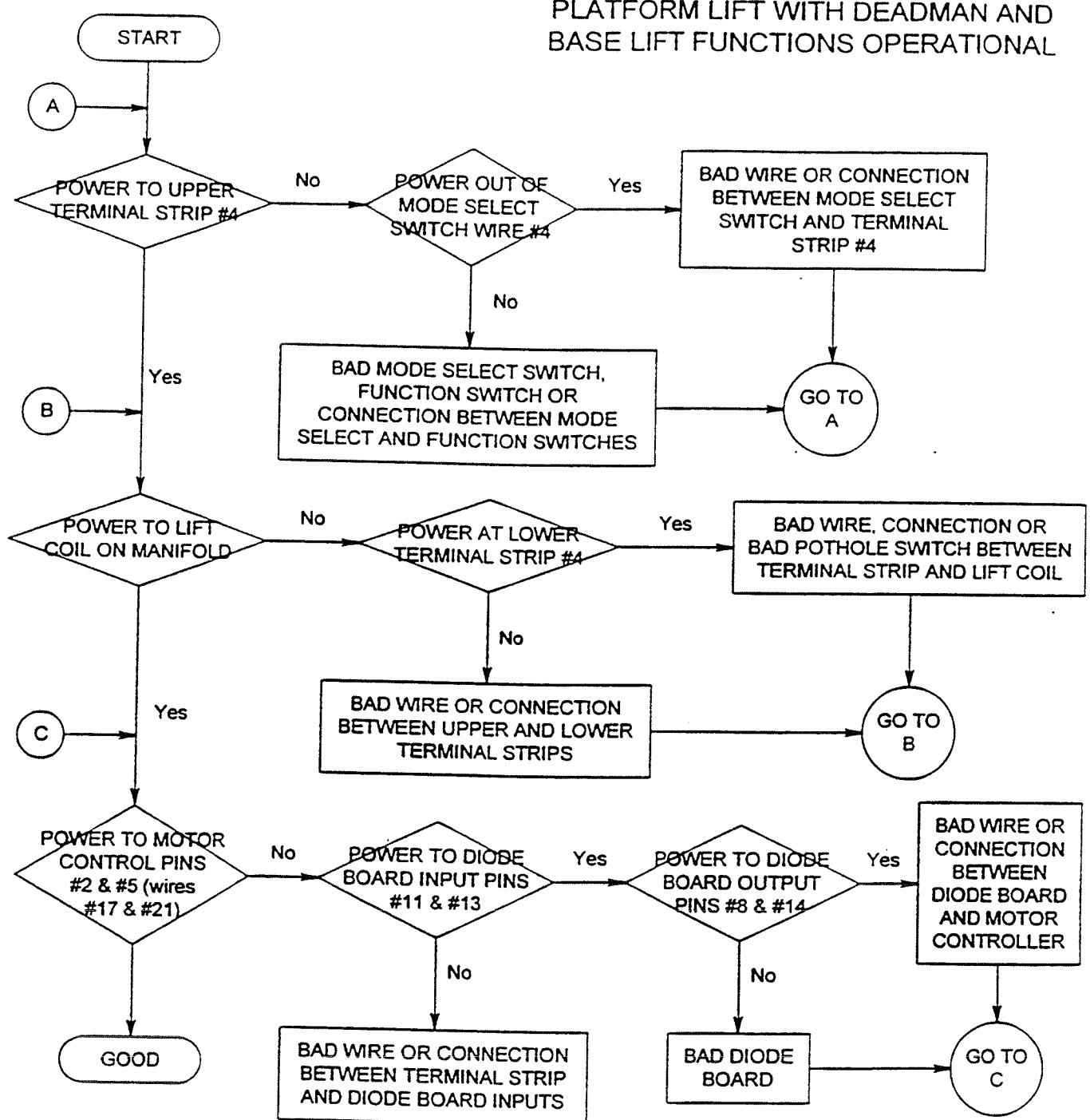
**KEY SWITCH ON PLATFORM SELECTION WITH
NO FUNCTIONS ACTIVATED, WITH BASE
SELECTION OPERATIONAL.**



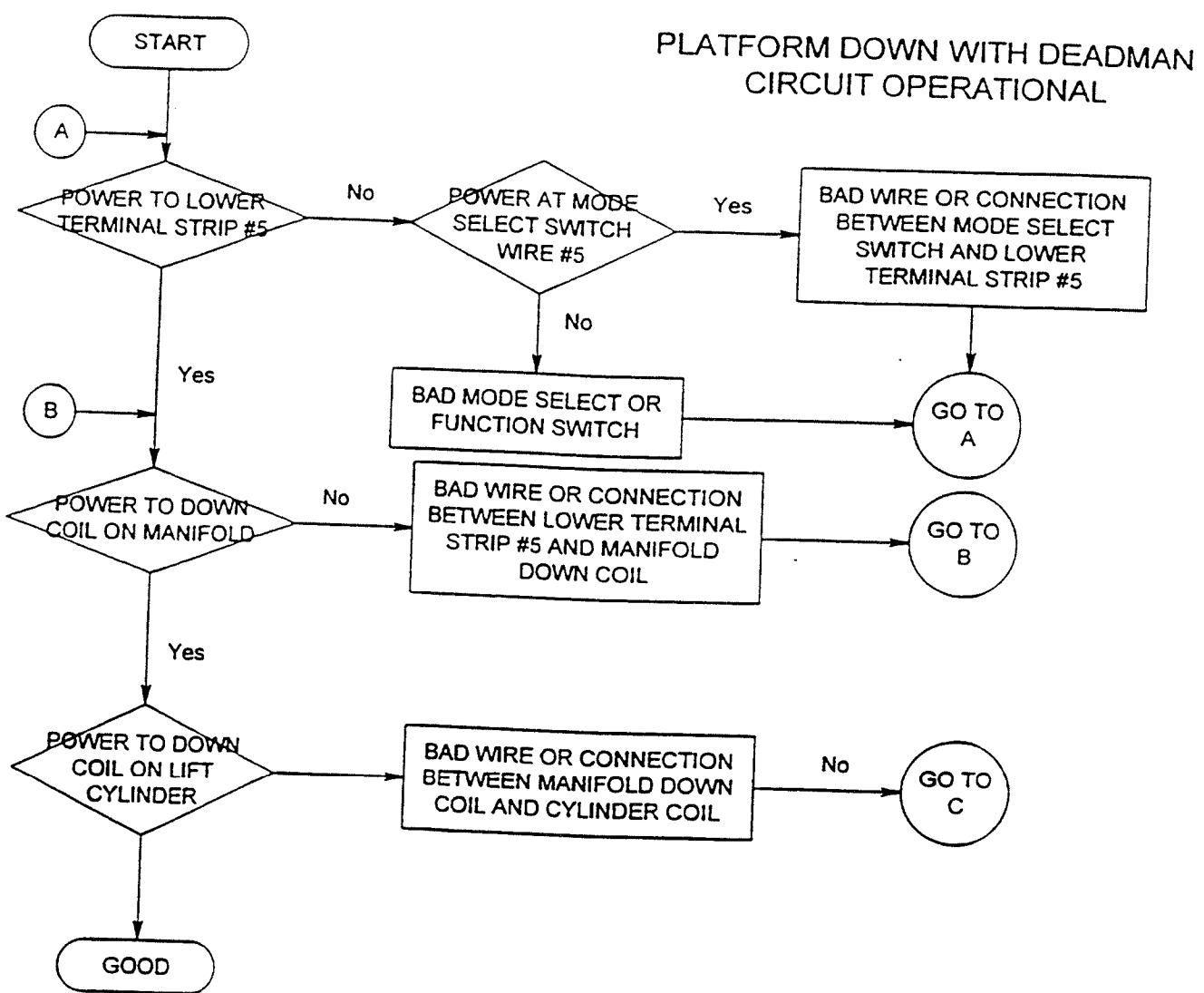
**DEADMAN ENGAGED WITH POWER CIRCUIT
FOR PLATFORM OPERATIONAL.**



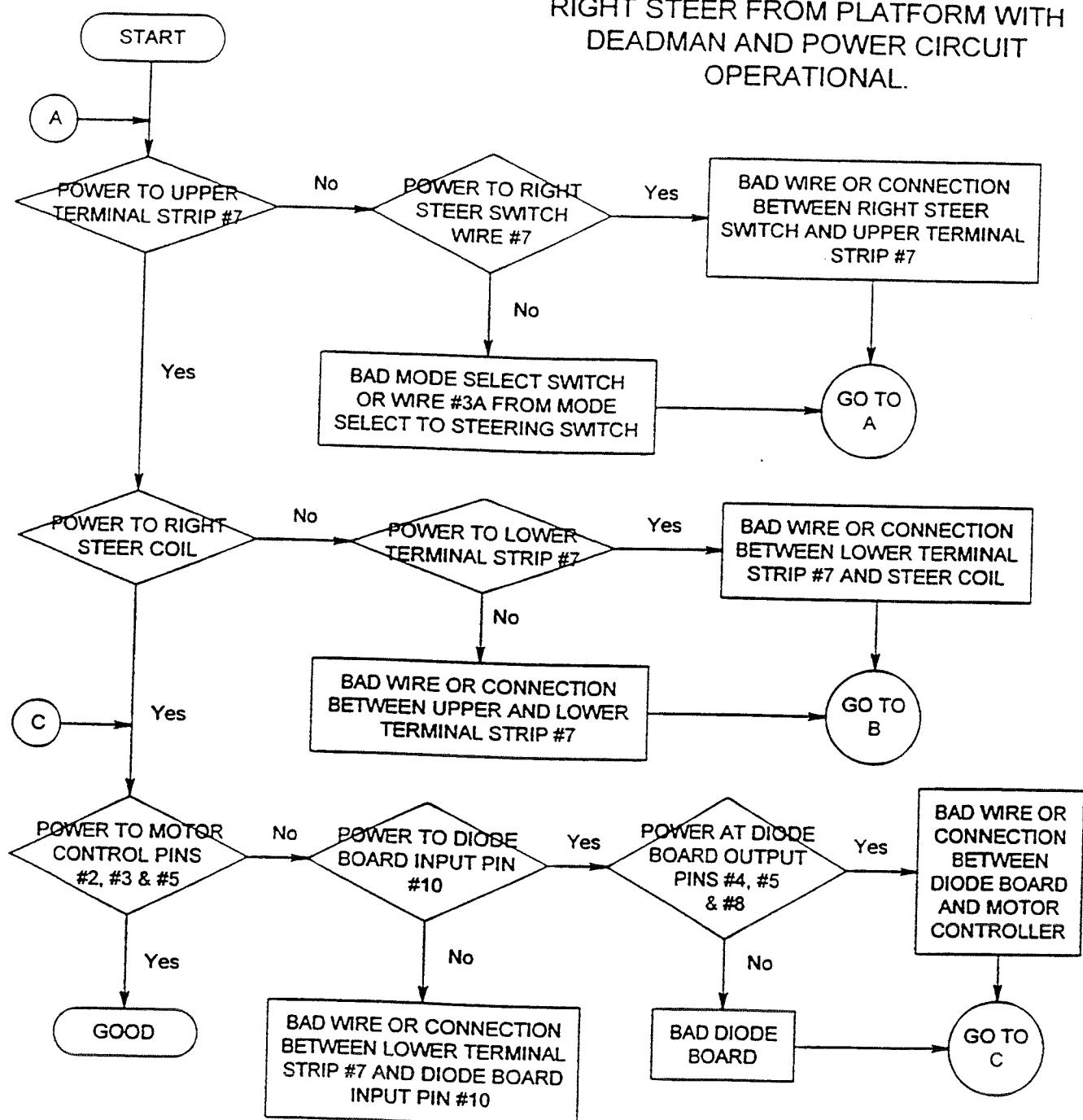
PLATFORM LIFT WITH DEADMAN AND
BASE LIFT FUNCTIONS OPERATIONAL

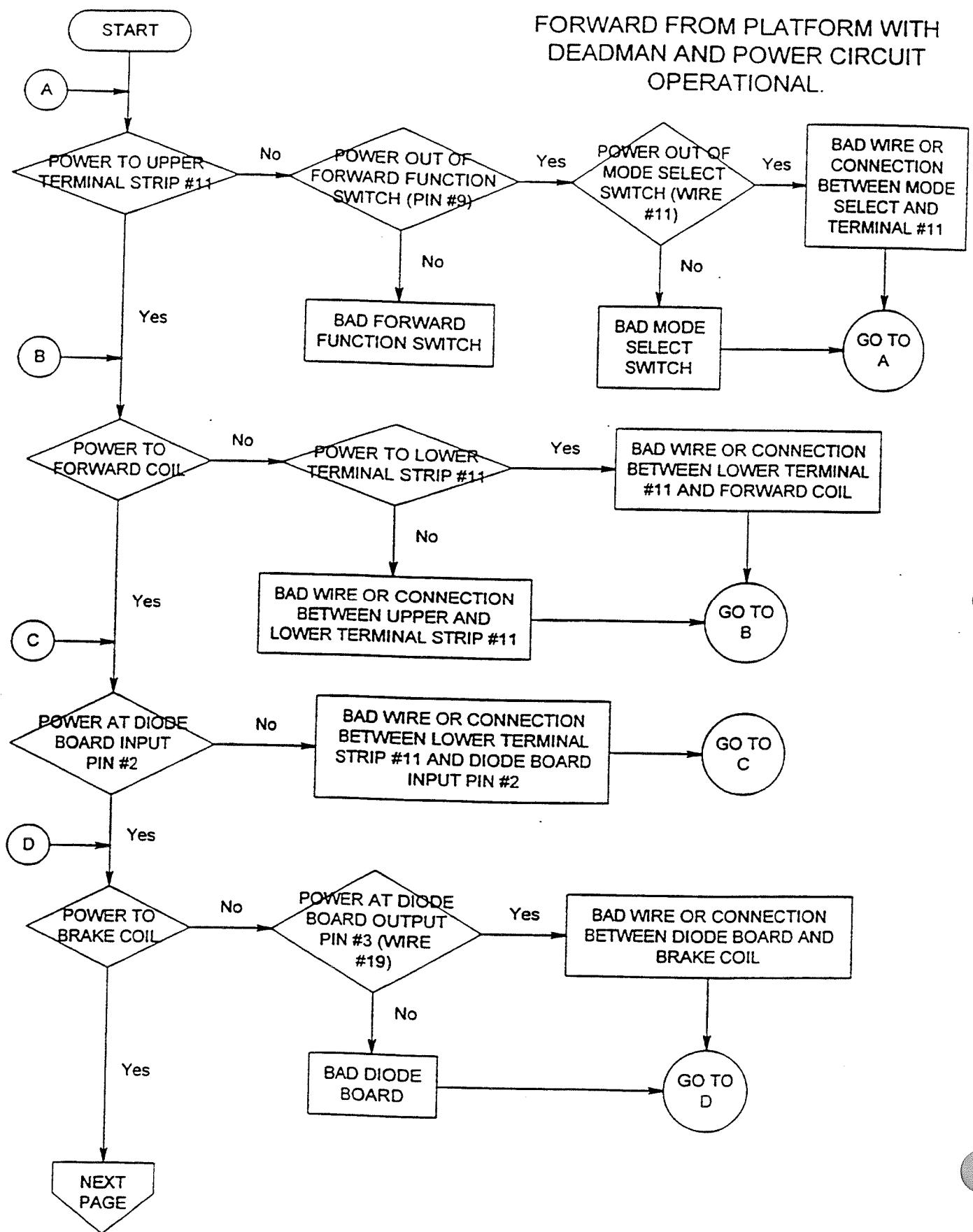


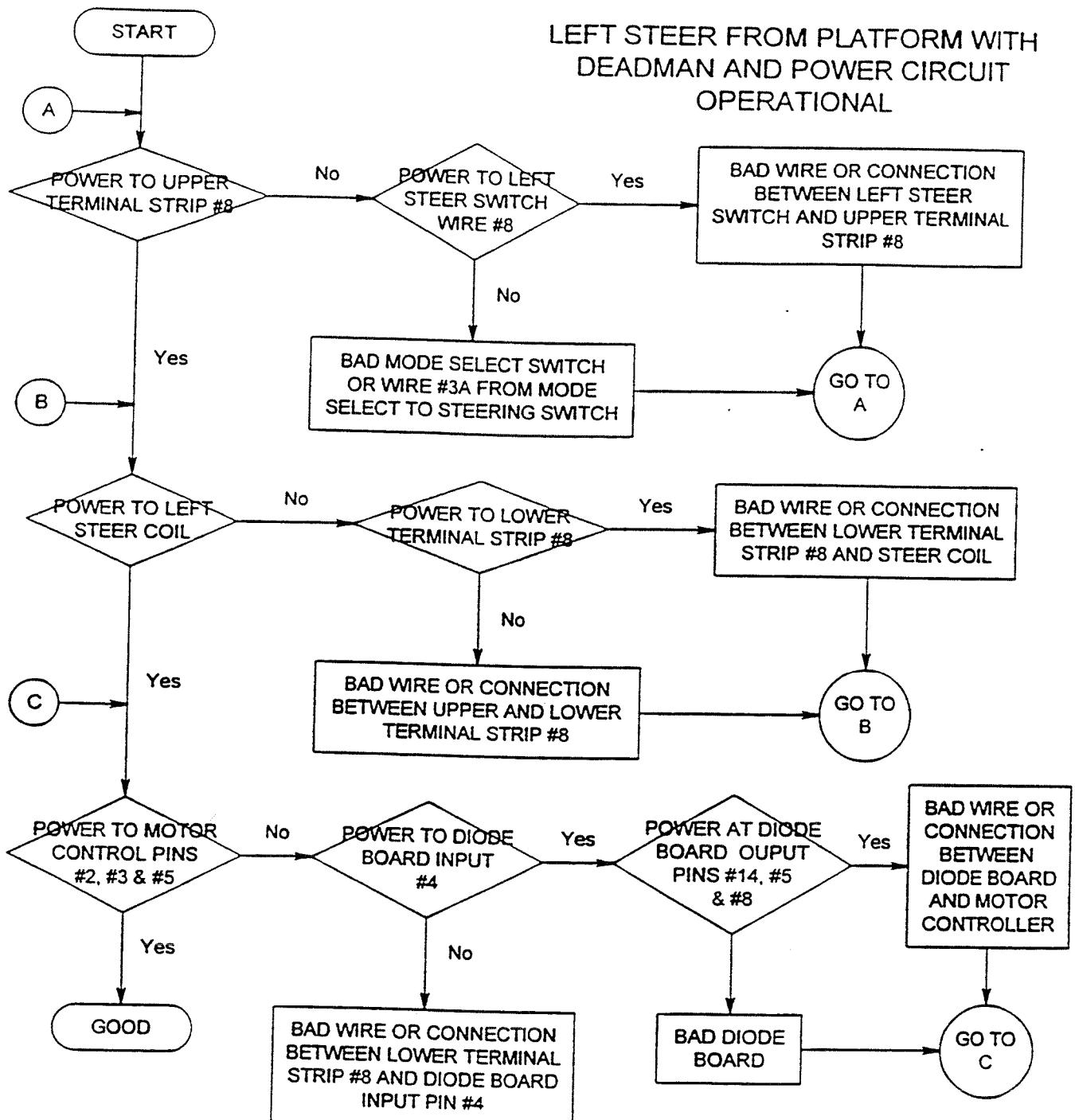
NOTE: LIFT COIL MUST HAVE MORE THAN 18.1V.
THE MOTOR CONTROLLER HAS AN 18V LIFT CUT
OUT

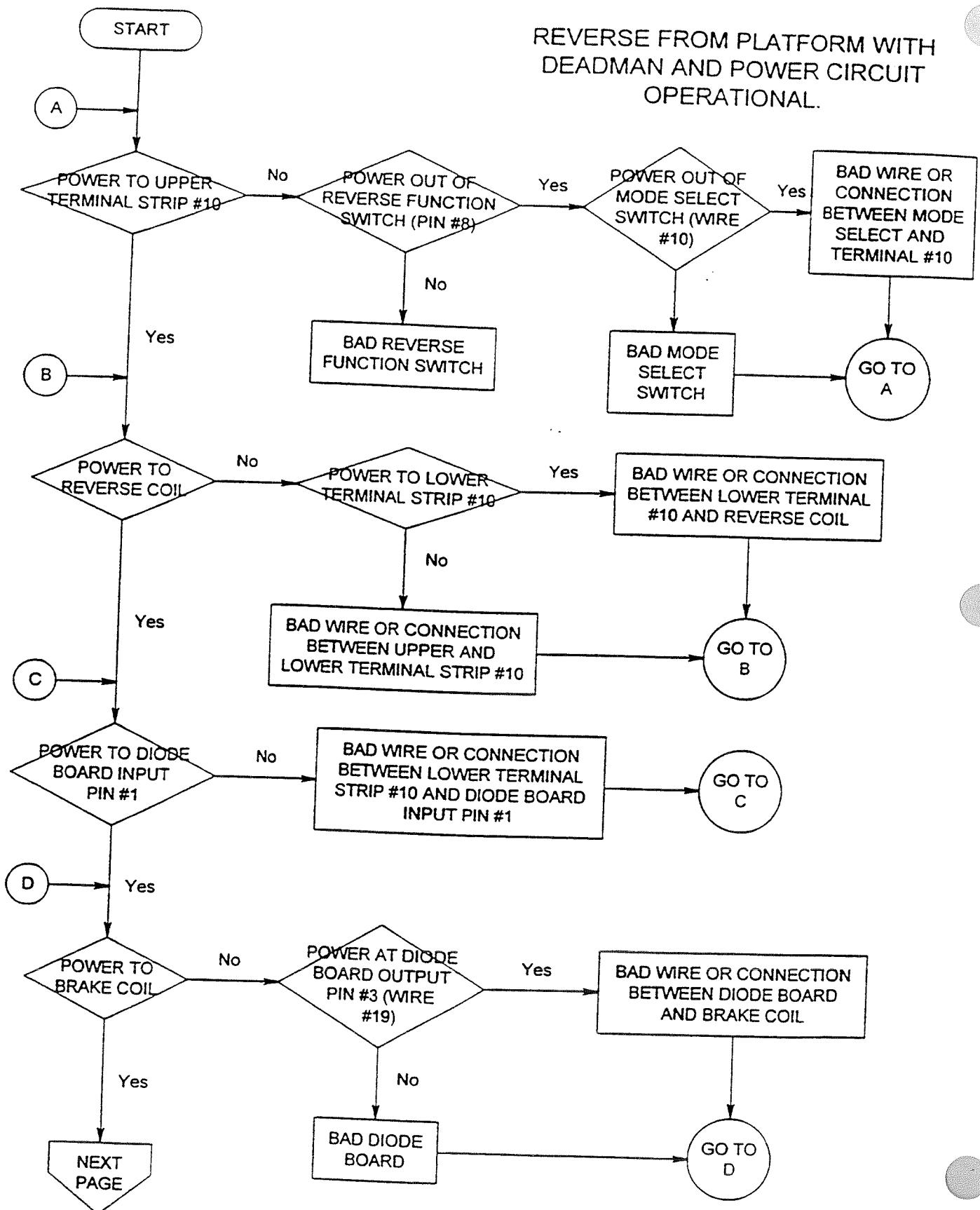


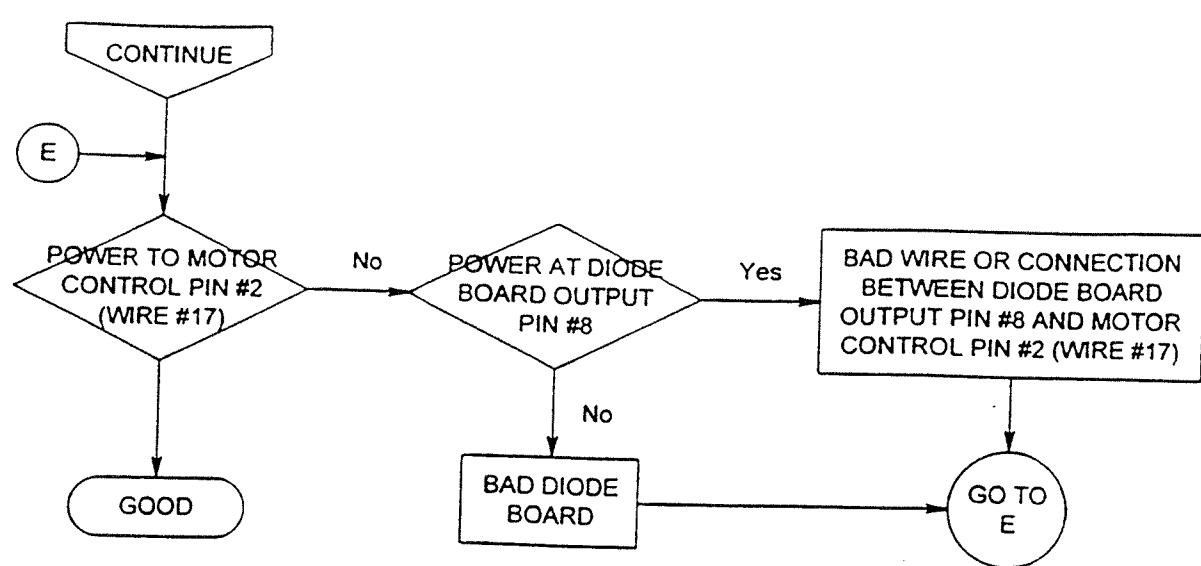
RIGHT STEER FROM PLATFORM WITH
DEADMAN AND POWER CIRCUIT
OPERATIONAL.

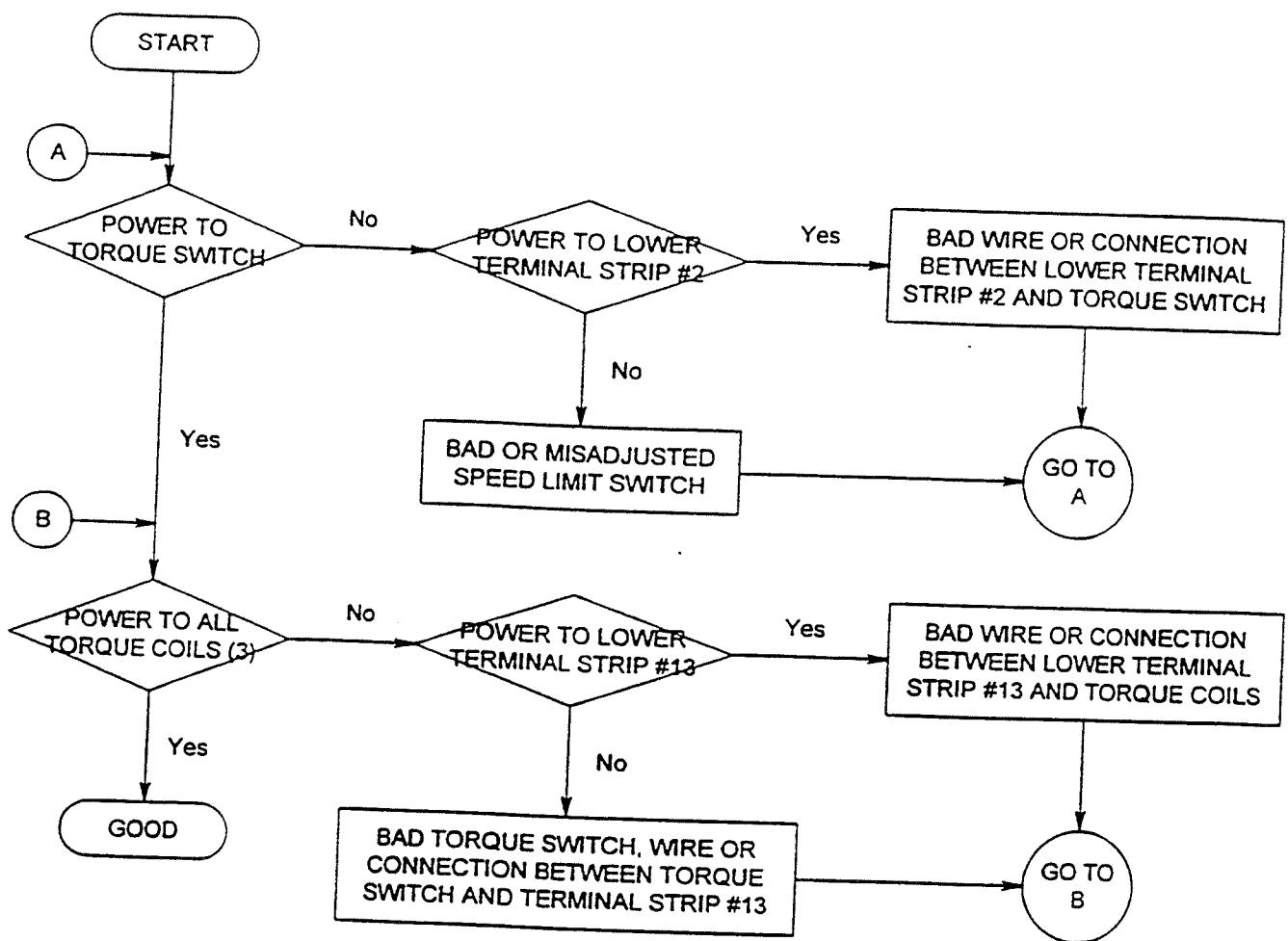


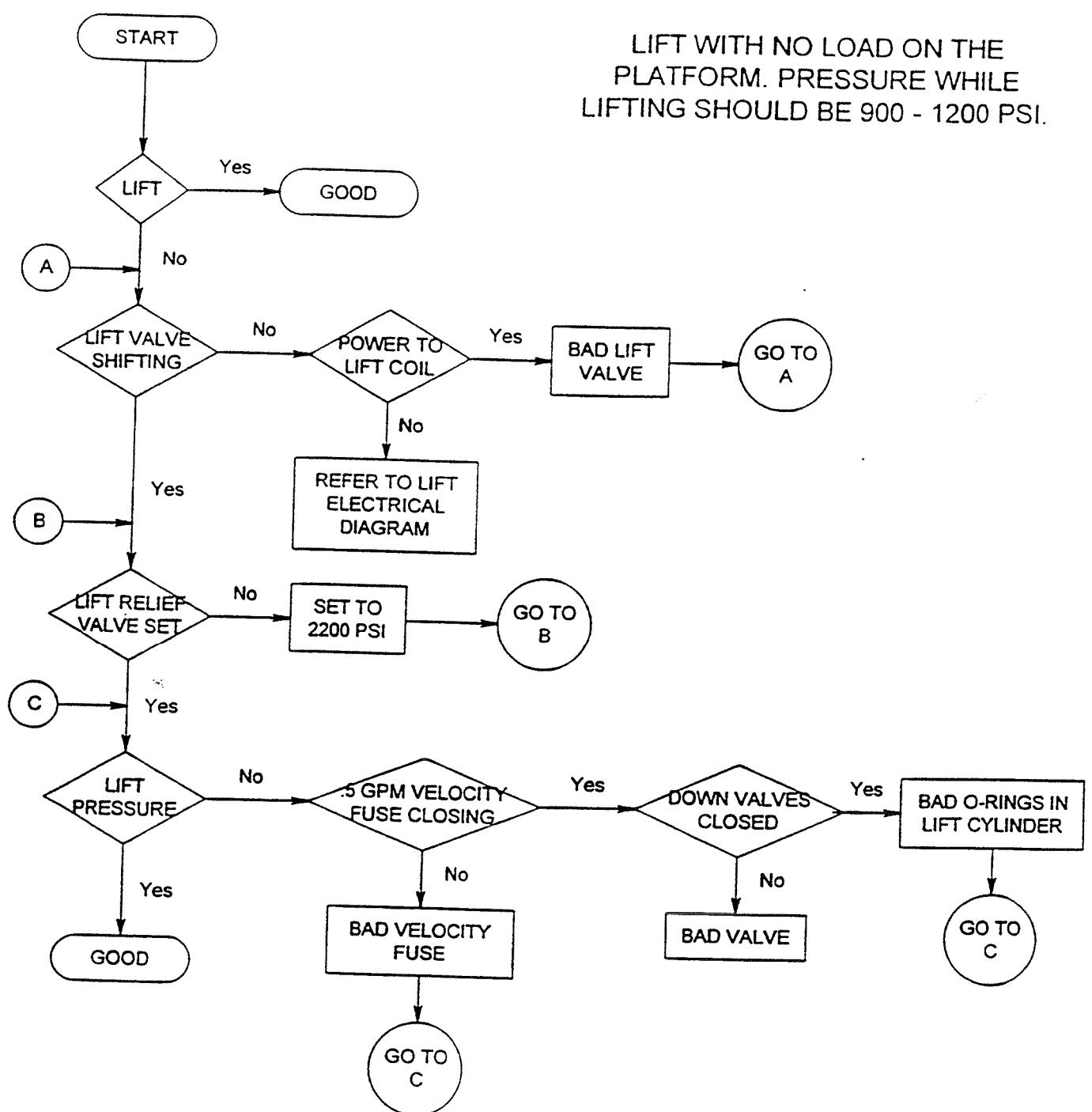


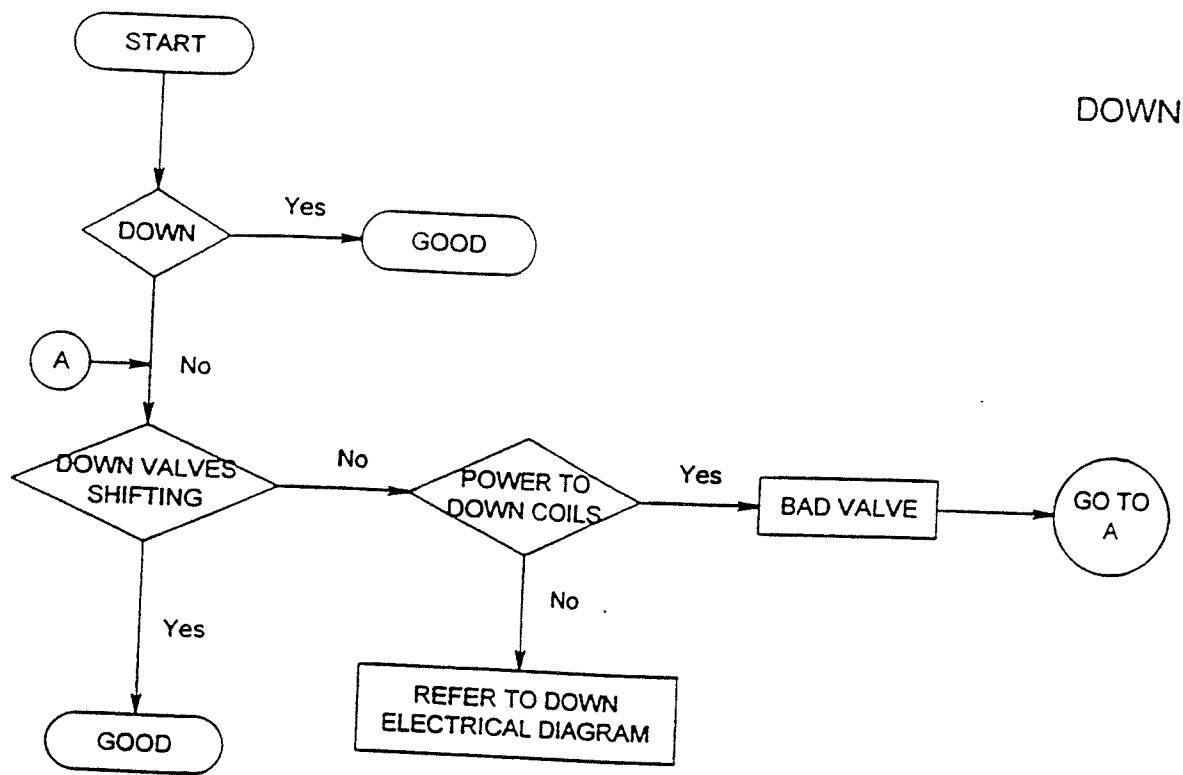


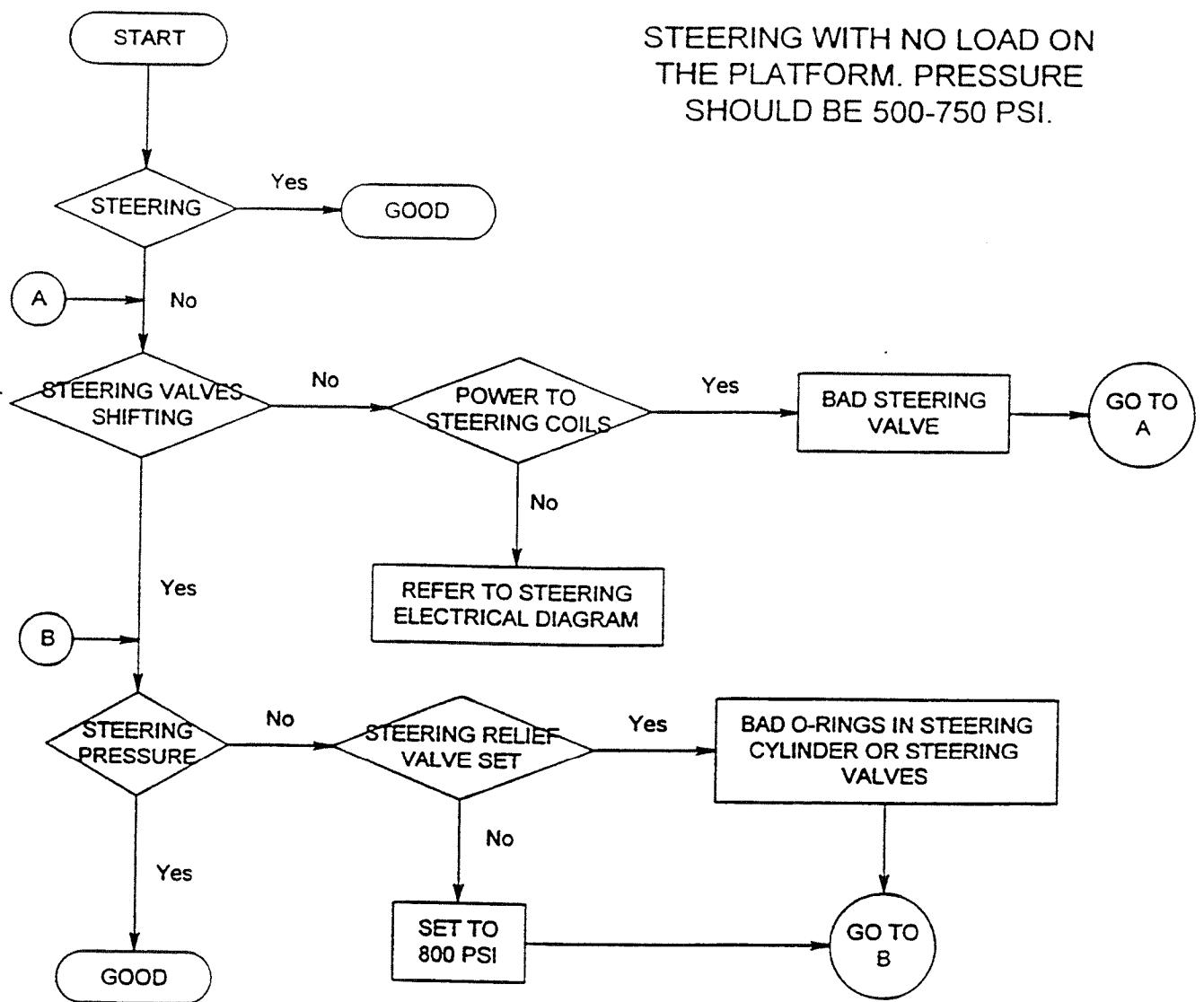


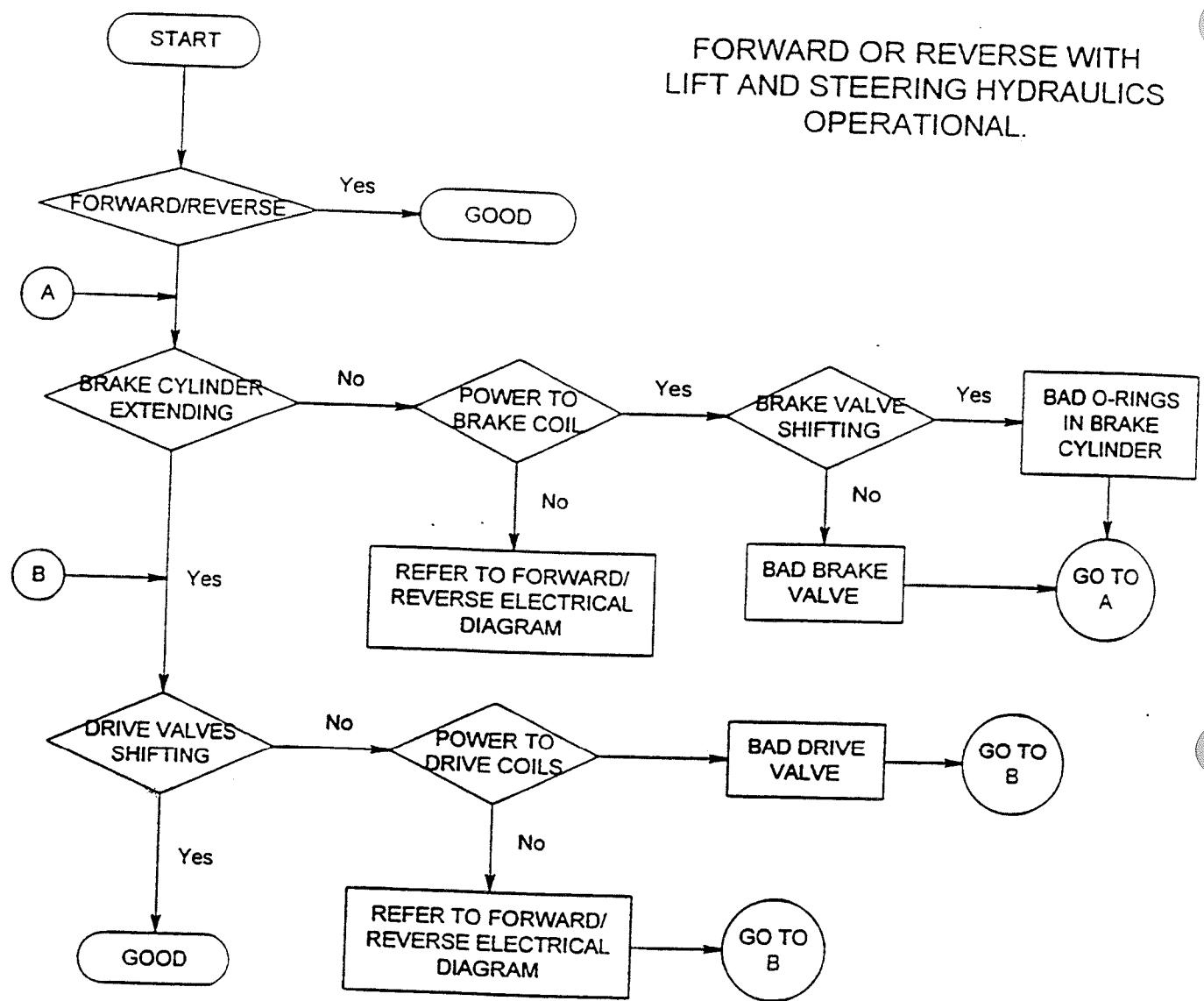


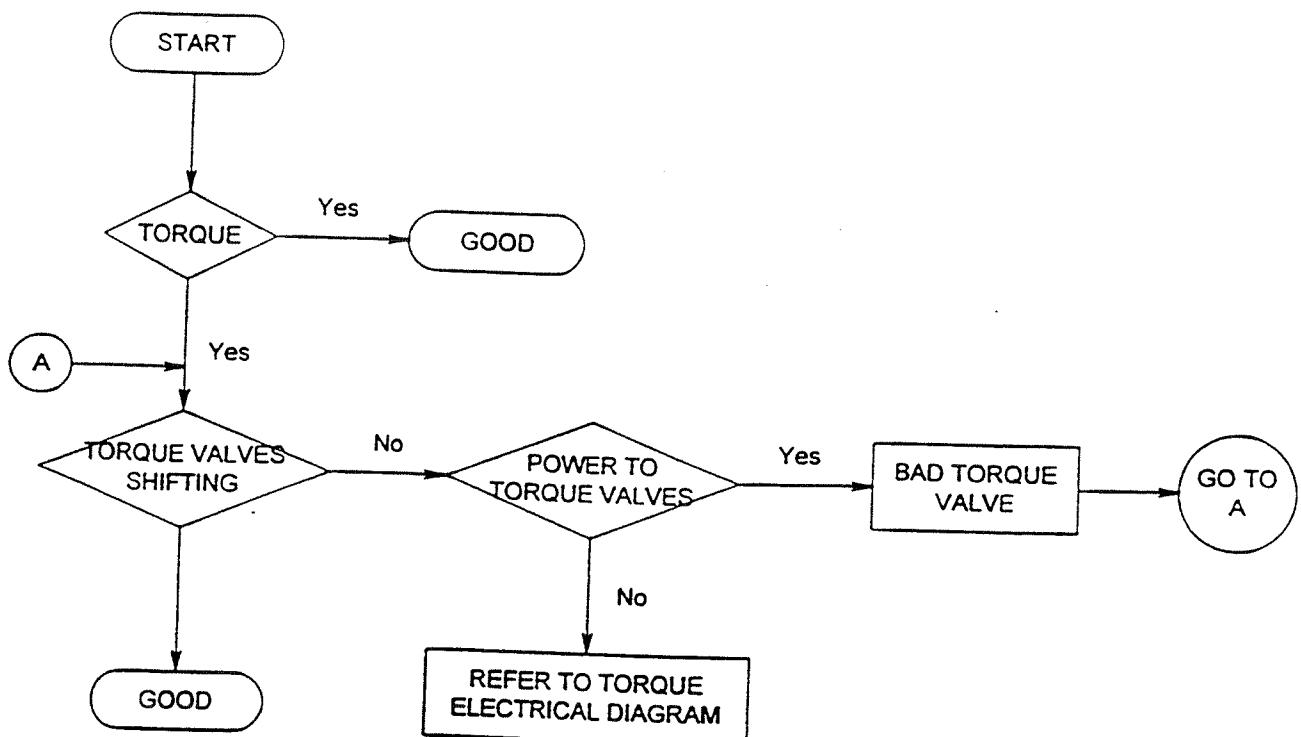












TORQUE FUNCTION WITH FORWARD AND REVERSE OPERATIONAL. WITH ONLY ONE TORQUE VALVE SHIFTING ONE WHEEL WILL TURN FASTER THAN THE OTHER. IT WILL NOT LOCK UP.

PRESSURE SET-UP

MAIN LINE RELIEF

DISCONNECT THE WIRE TO THE FORWARD COIL. THIS WILL ALLOW THE UNIT TO DEAD HEAD AGAINST THE DRIVE VALVE AND DUMP OVER THE MAIN LINE RELIEF VALVE. WITH THE WIRE DISCONNECTED ACTIVATE FORWARD. THE PRESSURE SHOULD READ 2750 PSI. THIS TEST WILL ALSO TEST THE O-RINGS ON EACH VALVE ON THAT CIRCUIT. WITH A BAD O-RING YOU BE UNABLE TO REACH MAIN LINE PRESSURE. ALSO THIS WILL TEST THE MOTOR CONTROLLER. WITH A 2 H.P. ELECTRIC AT MAIN PRESSURE WILL DRAW MORE THAN 200 AMPS AND IF THE MACHINE HAS A 180 AMP OR BAD MOTOR CONTROLLER YOU WILL NOT REACH MAIN LINE RELIEF.

STEERING RELIEF

TO SET STEERING RELIEF DEAD HEAD THE STEERING TO ONE SIDE OR THE OTHER. THIS WILL DUMP OVER THE STEERING RELIEF VALVE. THE PRESSURE SHOULD BE 800 PSI.

LIFT RELIEF

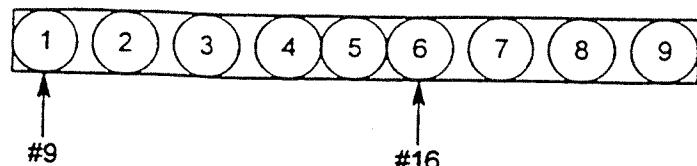
TO SET LIFT RELIEF DEAD HEAD AT FULL EXTENSION. THIS WILL ALLOW THE MACHINE TO DUMP OVER THE LIFT RELIEF VALVE. THE PRESSURE WILL BE 2200 PSI.

COUNTER BALANCE VALVE

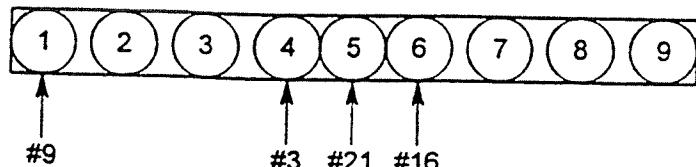
THERE IS TWO WAYS TO SET THE COUNTER BALANCE. ONE WAY IS TO JACK THE FRONT END UP AND DO A "NO LOAD" DRIVE. PRESSURE SHOULD BE 550-600 PSI. THE OTHER WAY IS TO TAKE ONE OF THE DRIVE VALVES OUT AND PLUG THE PORT. THIS WILL ALLOW THE FLUID TO DUMP OVER THE COUNTER BALANCE VALVE. ACTIVATE DRIVE AND THE PRESSURE SHOULD BE 450 PSI.

MOTOR CONTROLLER PIN NUMBERS THAT HAVE VOLTAGE WITH EACH FUNCTION OPERATIONAL.

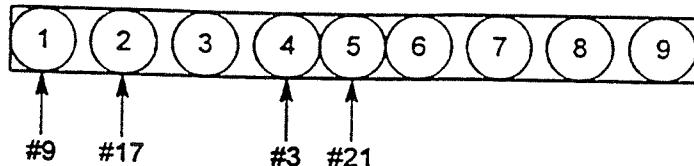
NO FUNCTIONS



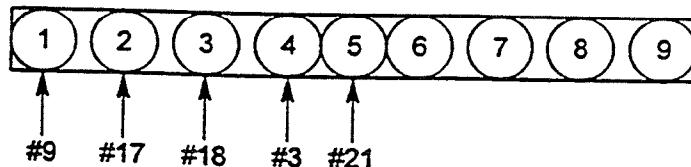
DEADMAN ENGAGED



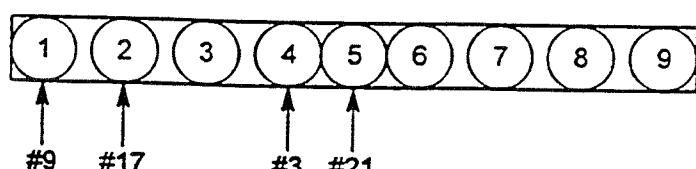
UP BASE AND PLATFORM



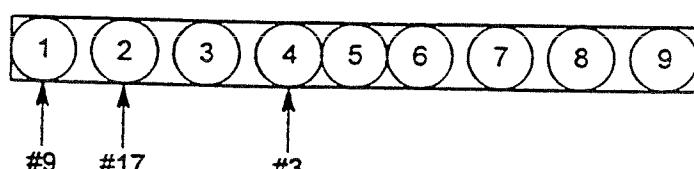
LEFT / RIGHT



FORWARD / REVERSE
PLATFORM DOWN



FORWARD / REVERSE
PLATFORM UP



NOTES

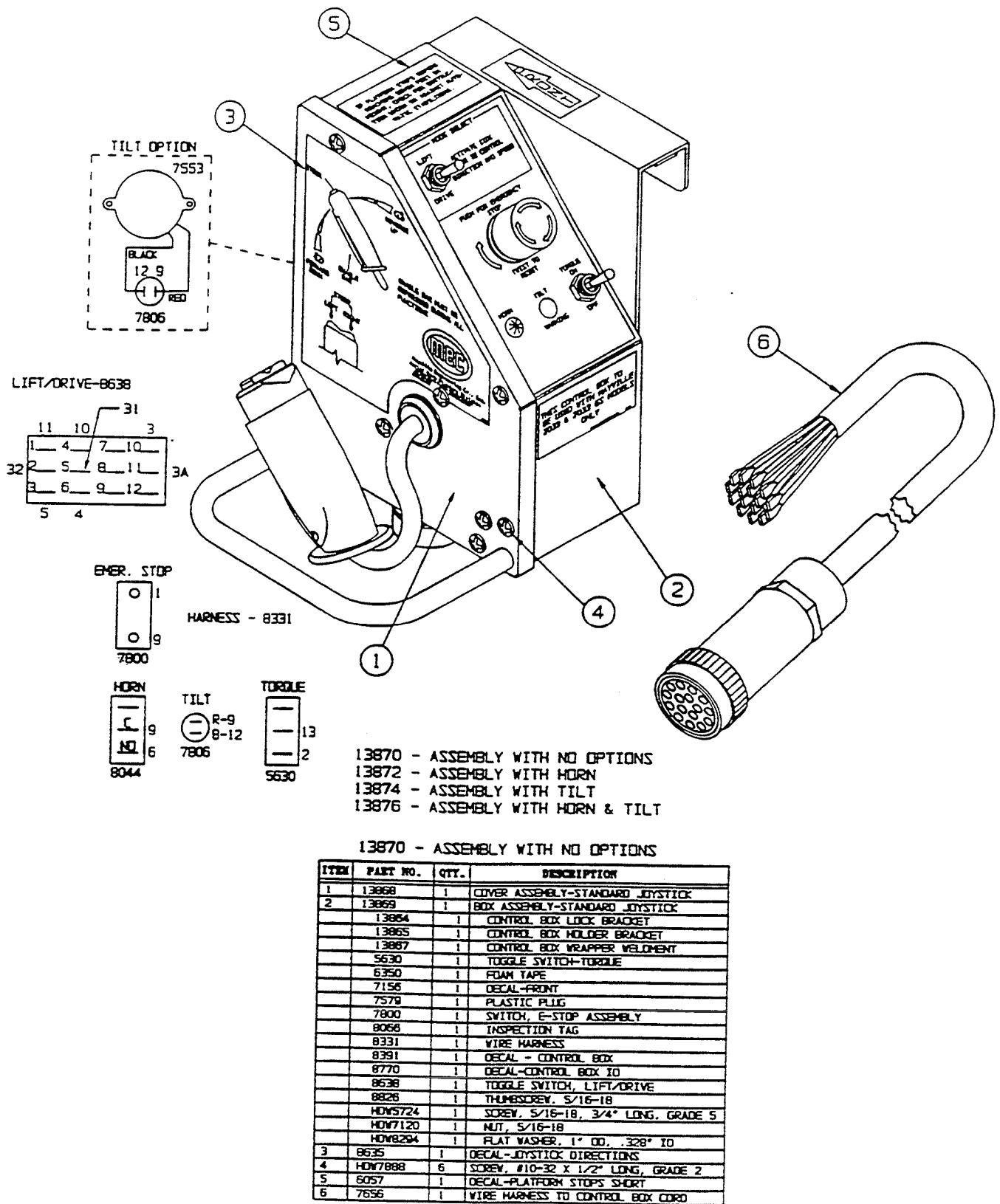
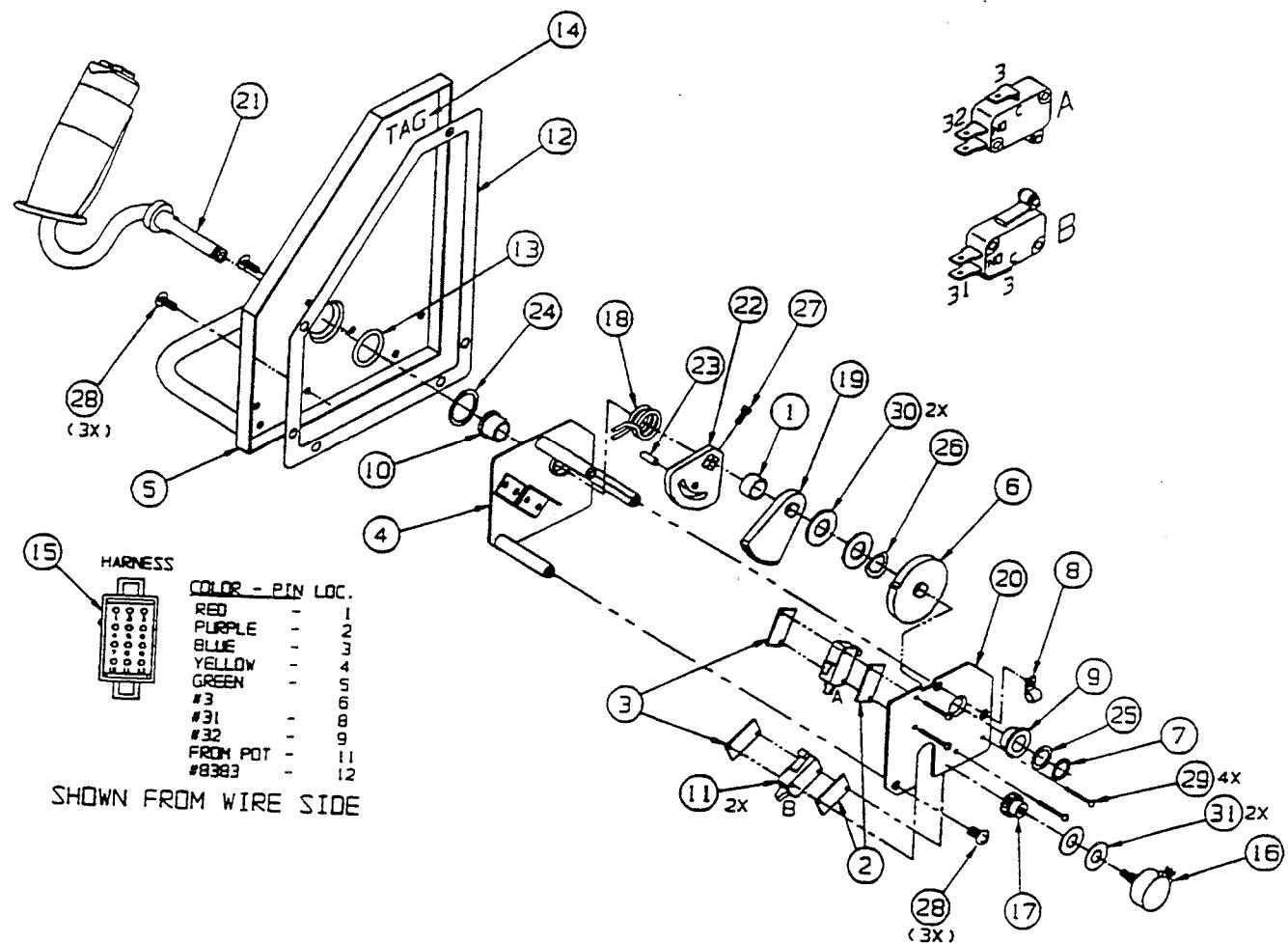


Figure 3-1. 2033ES Upper Control Box Assembly

CONTROL BOX CAM ASSEMBLY - 13868



ART557-R1
 BK12244
 12/11/98

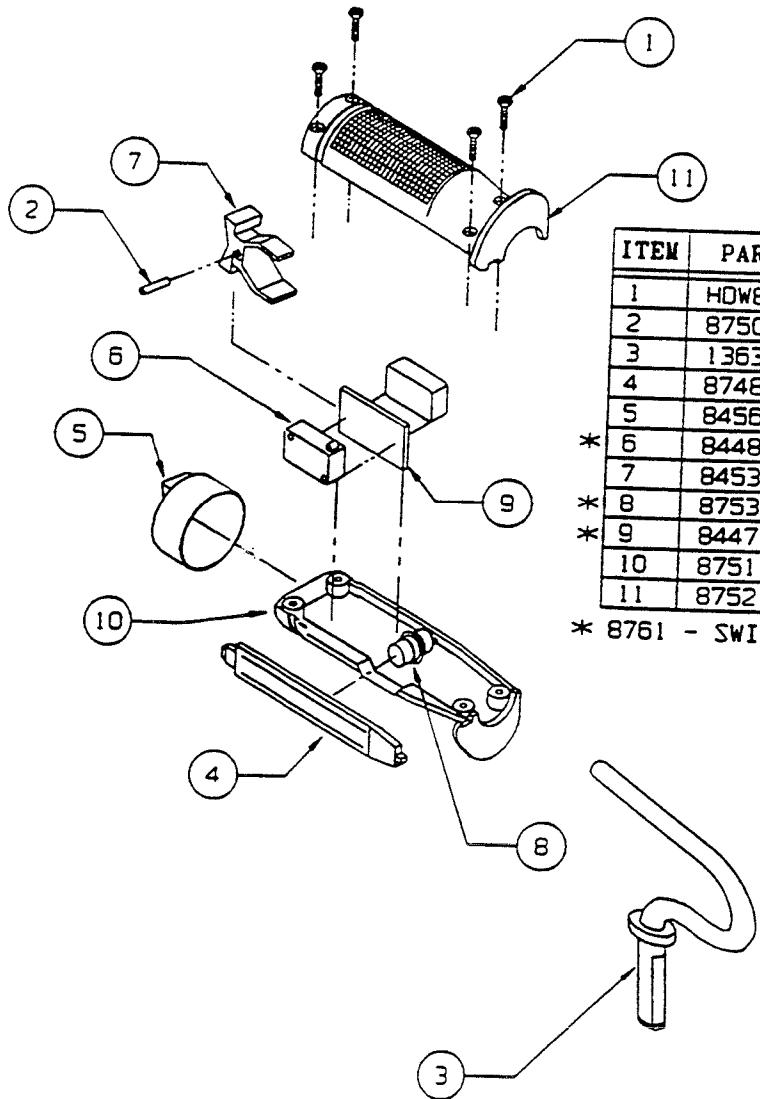
Figure 3-2. 2033ES CONTROL BOX CAM ASSEMBLY

ITEM	PART NO.	QTY.	DESCRIPTION
1	3763	1	SPACER STEP - JOYSTICK
2	3764	2	SPACER PLATE - JOYSTICK
3	3765	2	STRAP PLATE - JOYSTICK
4	3766	1	TOP PLATE WELDMENT - JOYSTICK
5	3772	1	COVER WELDMENT - JOYSTICK
6	3782	1	DIRECTIONAL CAM - JOYSTICK
7	5736	1	RETAINING RING, EXT. .50"
8	6917	1	CABLE CLAMP .25"
9	7818	1	BEARING, BRONZE FLANGED
10	7819	1	BEARING, BRONZE FLANGED
11	8696	2	SWITCH, LIMIT MICRO - V7
12	7875	1	GASKET - JOYSTICK
13	7882	1	O-RING 7/8 ID X 1.125 OD
14	8066	1	TAG, INSPECTION LINE
15	8346	1	WIRE HARNESS - JOYSTICK
16	8383	1	POTENTIOMETER 20K 13527
17	8389	1	GEAR - SPUR
18	8435	1	SPRING TORSION JOYSTICK 2033
19	13402	1	LARGE GEAR - PROP JOYSTICK
20	13403	1	BOTTOM PLATE CONTROL BOX - JS
21	13647	1	CONTROL ARM ASSEMBLY-JOYSTICK
22	13502	1	CENTERING BRACKET - JOYSTICK
23	100/8348	1	PIN, HOLD DOWN
24	HOW3768	1	FLAT WASH .895 ID X 1.077 OD X .055 THK
25	HOW3771	1	FLAT WASH .50 ID X .688 OD X .033 THK
26	HOW7881	1	BEVEL WASH .531 ID X .795 OD X .011 THK
27	HOW7887	1	CAP SCREW #6-32 .50" GRADE 8
28	HOW7888	6	CAP SCREW #10-32 .50" GRADE 2 TRUSS HD CROSS RECESSED DRIVE
29	HOW8399	4	MACH SCREW #4-40 .62" ROUND HEAD SLOTTED DRIVE
30	HOW8531	2	FLAT WASH B .531 ID X 1.00 OD X .063 THK
31	HOW8567	2	FLAT WASH .380 ID X .844 OD X .048 THK

ART557-R1
BM12244
12/11/96

Figure 3-2. 2033ES CONTROL BOX CAM ASSEMBLY

ASSEMBLY 13647

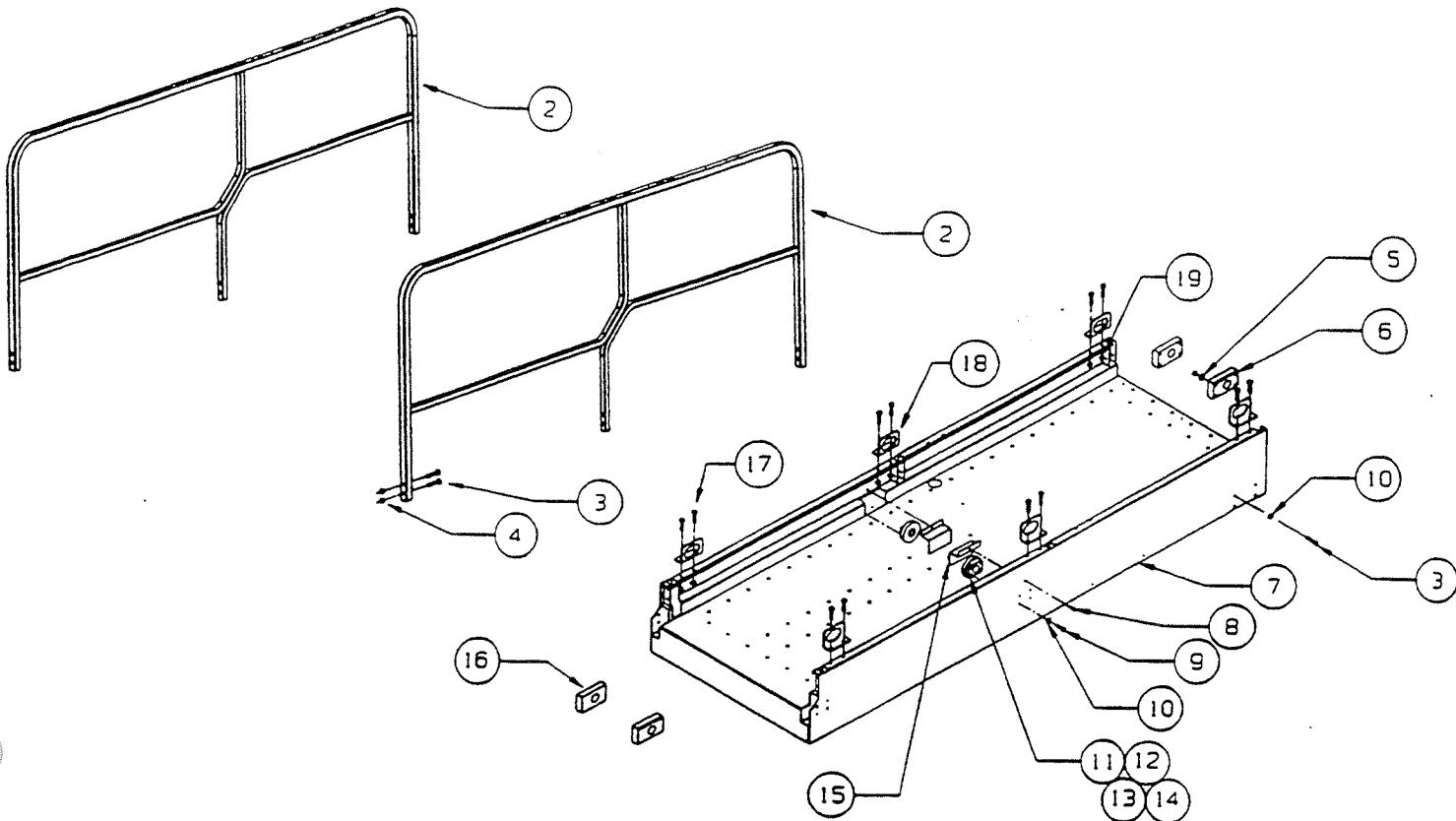


ITEM	PART NO.	QTY.	DESCRIPTION	
1	H0W8455	4	SCREW, 6 X 1/2 TAPTRITE	
2	8750	1	PIN	
3	13638	1	CONTROL ARM WITHOUT WIRE	
4	8748	1	TRIGGER	
5	8456	1	ROCKER BOOT	
*	6	8448	2	SWITCH - V3 P-Q
*	7	8453	1	SWITCH ACTUATOR
*	8	8753	1	MOTION SWITCH, ON-OFF
*	9	8447	1	SWITCH SEPARATOR
10	8751	1	GRIP - BOTTOM HALF	
11	8752	1	GRIP - TOP HALF	

* 8761 - SWITCH ASSEMBLY-INCLUDES WIRING AND ITEMS 6, 8, & 9

ART188 R3
BNS040
01/04/99

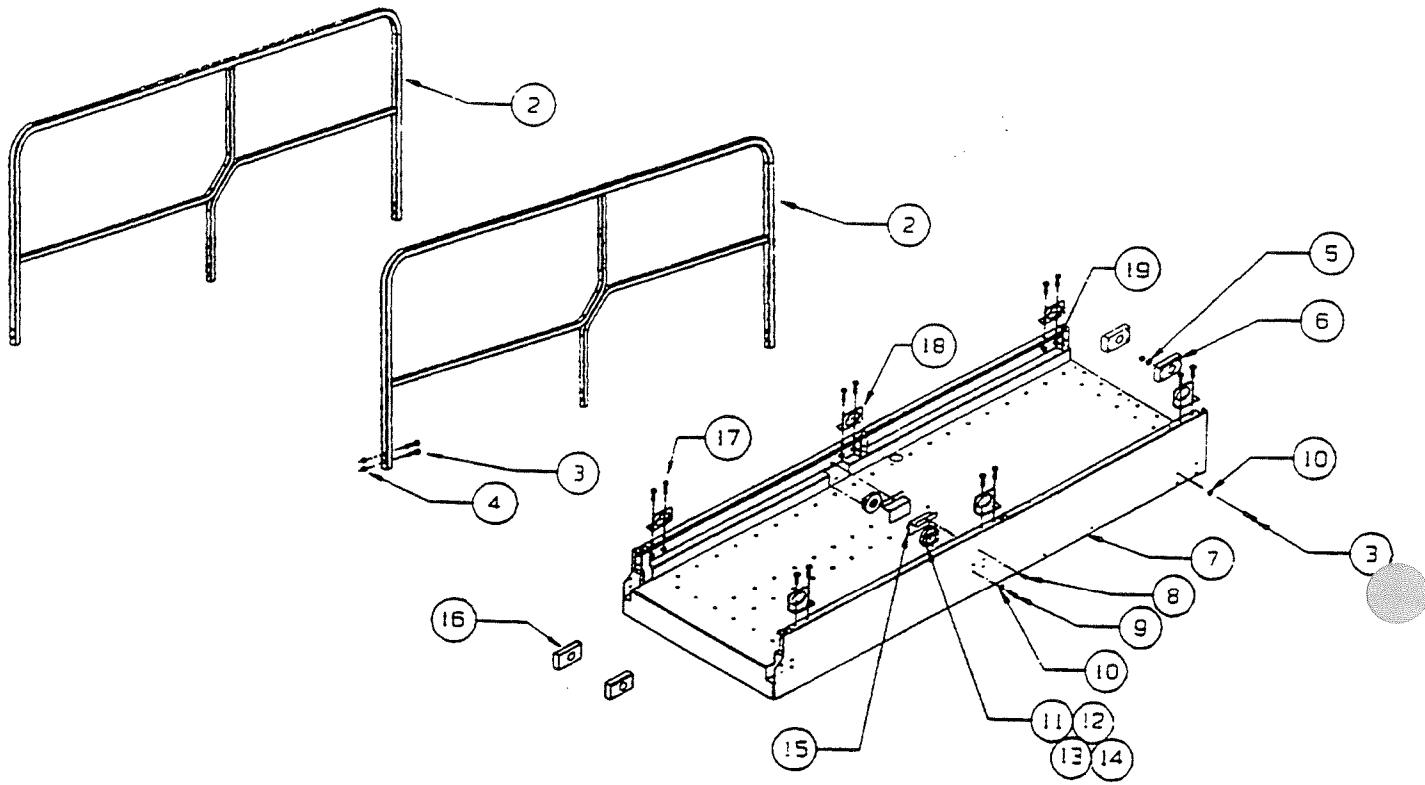
Figure 3-3. CONTROL ARM ASSEMBLY



ITEM	PART NO.	QTY.	DESCRIPTION
1			
2	13783	2	RAIL-MAIN PLATFORM, RIGHT
3	HOW8486	20	BOLT 5/16"-18 UNC X 1.87 LG GRADE 5
4	HOW8304	20	LOCK NUT 5/16"-18 GRADE 5
5	HOW8294	8	WASHER FLAT, .328 ID X 1.00 OD X .100 THK
6	13777	2	PLATFORM FIXED END BLOCK
7	13810	1	PLATFORM WELDMENT-2033ES
8	HOW6455	2	BOLT 1/4"-20 UNC X .50 LG GRADE 5
9	HOW5724	16	BOLT 5/16"-18 X .75 LG GRADE 5
10	HOW5217	24	WASHER, FLAT, .343 ID X .688 OD X .063 THK
11	13267	4	ROLLER PLATE WELDMENT
12	13230	4	ROLLER
13	HOW8370	4	WASHER, FLAT, 1.015 ID X 1.375 OD X .062 THK
14	S918	4	RETAINING RING
15	13637	2	BRACKET, ROLLER COVER
16	13778	2	PLATFORM SLIDE BLOCK
	13893	1	LANYARD KIT
17	HOW6432	12	SCREW, 3/8" - 16, 3/4" LONG, GRADE 5
18	3923	6	BRACKET, ATTACH POINT W/90 DEG.
19	HOW8268	12	NUT, 3/8" - 16, CLASS B

ART558-R2
BM12274
8/4/97

Figure 4-1. 2033ES Platform and Rails Assembly



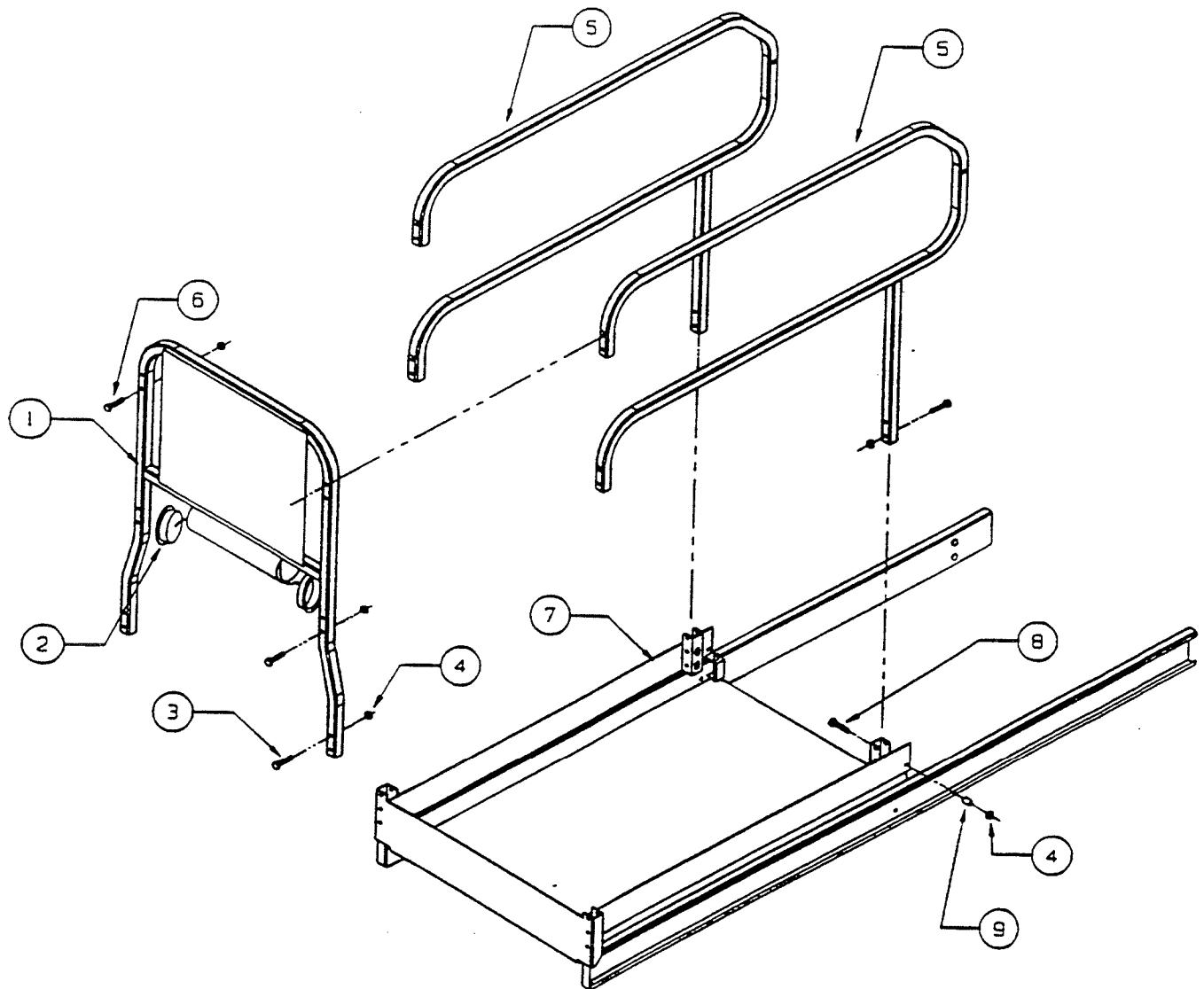
ART558-R2
8M12274
8/4/97

Figure 4-1a. 2033ES Platform and Rails Assembly

ITEM	PART NO.	QTY.	DESCRIPTION
1			
2	13783	2	RAIL-MAIN PLATFORM, RIGHT
3	HDW8486	20	BOLT 5/16"-18 UNC X 1.87 LG GRADE 5
4	HDW8304	20	LOCK NUT 5/16"-18 GRADE 5
5	HDW8294	8	WASHER FLAT, .328 ID X 1.00 OD X .100 THK
6	13777	2	PLATFORM FIXED END BLOCK
7	13810	1	PLATFORM WELDMENT-2033ES
8	HDW6455	2	BOLT 1/4"-20 UNC X .50 LG GRADE 5
9	HDW5724	16	BOLT 5/16"-18 X .75 LG GRADE 5
10	HDW5217	24	WASHER, FLAT, .343 ID X .688 OD X .063 THK
11	13267	4	ROLLER PLATE WELDMENT
12	13230	4	ROLLER
13	HDW8370	4	WASHER, FLAT, 1.015 ID X 1.375 OD X .062 THK
14	5918	4	RETAINING RING
15	13637	2	BRACKET, ROLLER COVER
16	13778	2	PLATFORM SLIDE BLOCK
	13893	1	LANYARD KIT
17	HDW6432	12	SCREW, 3/8" - 16, 3/4" LONG, GRADE 5
18	3923	6	BRACKET, ATTACH POINT W/90 DEG.
19	HDW8268	12	NUT, 3/8" - 16, CLASS B

ART558-R2
BM12274
8/4/97

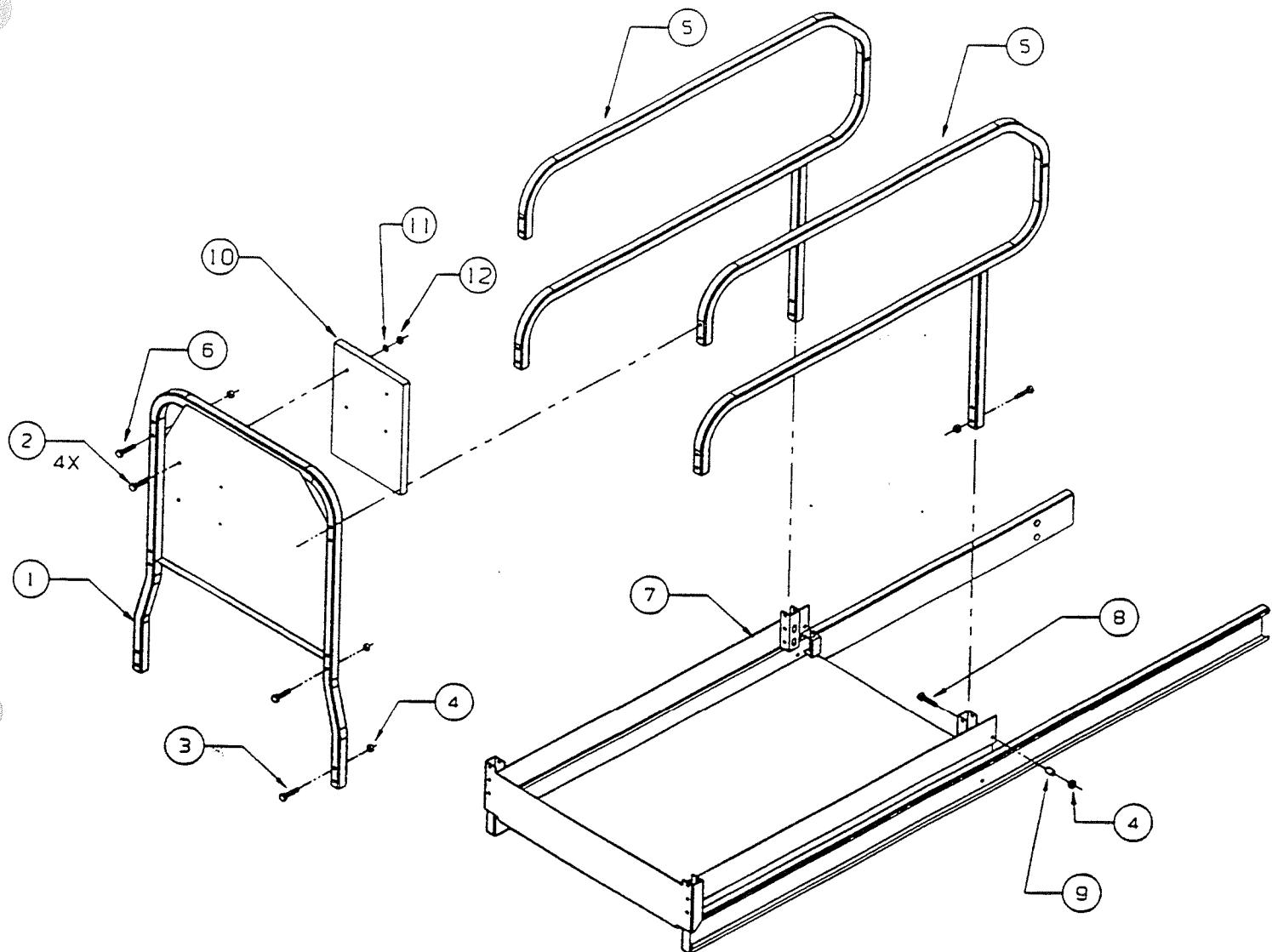
Figure 4-1a. 2033ES Platform and Rails Assembly



ITEM	PART NO.	QTY.	DESCRIPTION
1	13802	1	FRONT RAIL, EXTENSION PLATFORM
2	3788	1	MANUAL TUBE COVER ASSEMBLY
3	HDW8486	8	BOLT 5/16"-18 UNC X 1.87 LG GRADE 5
4	HDW8304	18	LOCK NUTS 5/16"-18 GRADE 5
5	13781	2	EXTENSION PLATFROM RAIL
6	HDW7471	8	BOLT 5/16"-18 UNC X 3.00 LG GRADE 5
7	13821	1	PLATFORM EXTENSION WELDMENT
8	HDW8310	2	BOLT 5/16"-18 UNC X 1.25 LG GRADE 5
9	13643	2	SPACER .384 ID X .50 OD X .750 LG

ART559 R0
8M12281
11/4/96

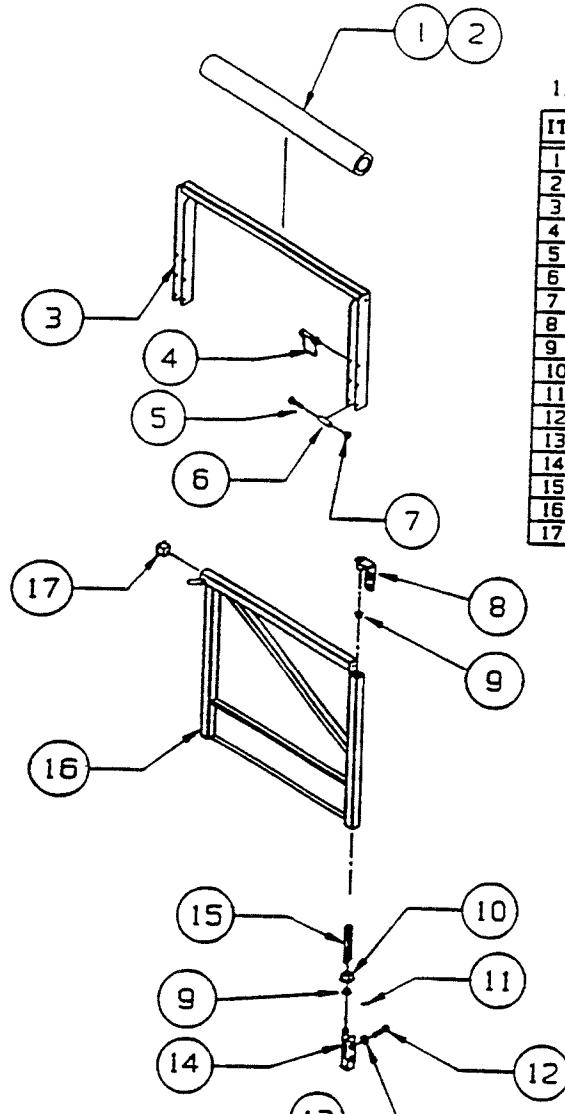
Figure 4-2. 2033ES EXTENDED PLATFORM & RAILS



ITEM	PART NO.	QTY.	DESCRIPTION
1	13802	1	FRONT RAIL, EXTENSION PLATFORM
2	HDW6455	4	SCREW, 1/4" - 20, 1/2" LONG
3	HDW8486	8	SCREW, 5/16"-18, 1 7/8" LONG
4	HDW8304	18	NUT, 5/16"-18
5	13781	2	EXTENSION PLATFORM RAIL
6	HDW7471	8	SCREW, 5/16"-18, 3" LONG
7	13821	1	PLATFORM EXTENSION WELDMENT
8	HDW8310	2	SCREW, 5/16"-18, 1 1/4" LONG
9	13643	2	SPACER .384 ID X .50 OD X .750 LG
10	8909	1	MANUAL ENCLOSURE
11	HDW8294	4	FLAT WASHER
12	HDW6461	4	NUT, 1/4" - 20

ART559 R1
BM12281
7/31/97

Figure 4-2a. 2033es Extended Platform and Rails

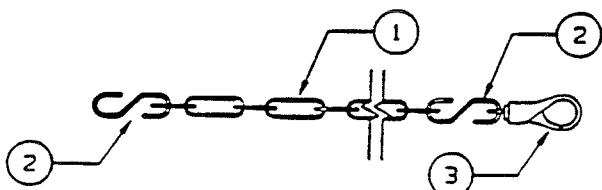


13851 SHEET LOAD GATE OPTION

ITEM	PART NO.	QTY.	DESCRIPTION
1	7048	2	RAIL PAD COVER
2	7805	2	RAIL PAD
3	13763	1	SHEET LOAD GATE WELMENT
4	HOW7593	1	LOCK PIN
5	HOW7119	4	BOLT 3/8"-16 UNC X 2.25 LG GRADE 5
6	13725	4	SPACER .384 ID X .50 OD X 1.355 LG
7	HOW8304	4	LOCK NUT 3/8"-16 GRADE 5
8	13281	1	UPPER REAR GATE MOUNTING BRACKET
9	8187	2	BEARING, FLANGED .63 ID X .63 LG
10	13272	1	REAR GATE PIVOT BLOCK
11	HOW7455	1	SPRING PIN .18 DIA X .75 LG
12	HOW8303	4	BOLT 5/16-18 2.00 LG GRADE 5
13	HOW8294	4	FLAT WASHER 3/8"
14	13610	1	LOWER REAR GATE MOUNTING BRACKET
15	8300	1	SPRING, TORSION
16	13581	1	REAR SWING GATE - EUROPEAN
17	6823	1	CAP PLUG 1 1/4" SQ TUBE

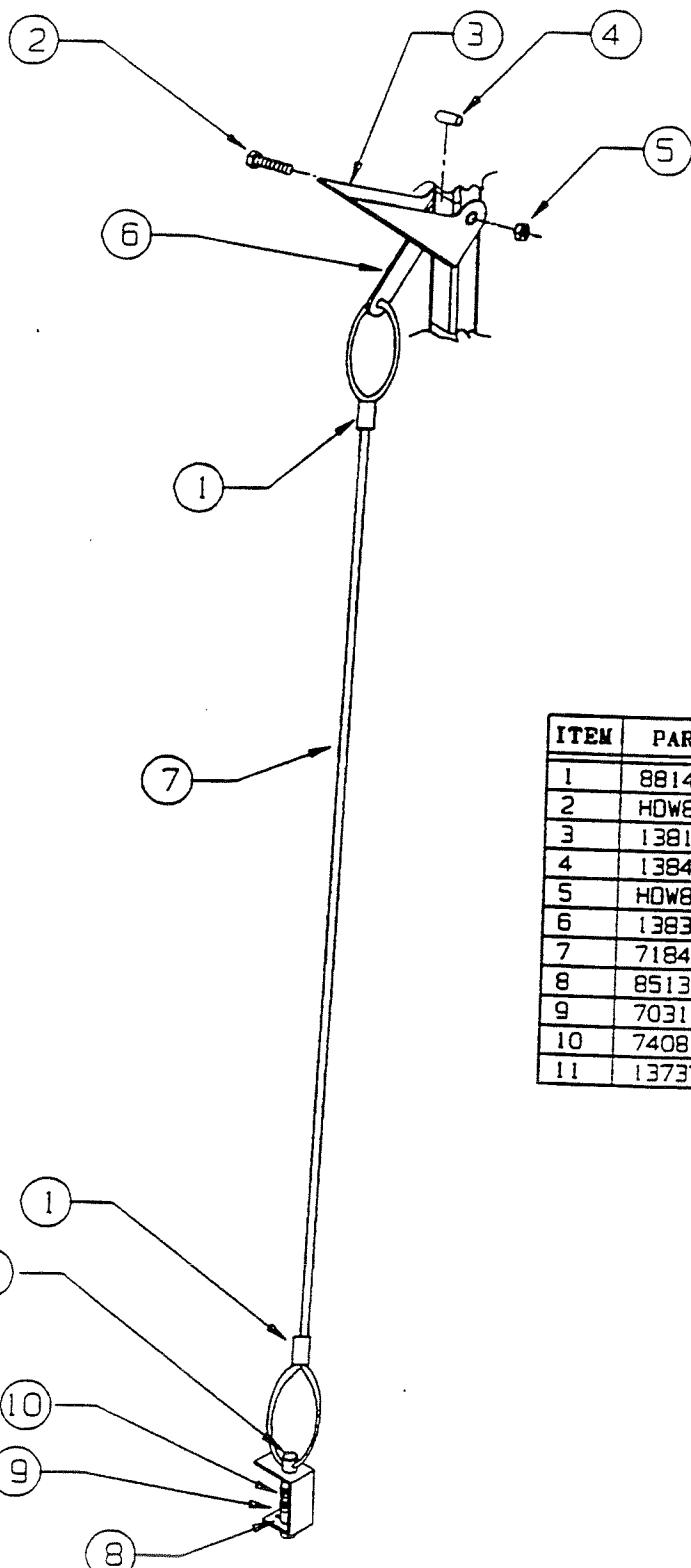
13850 CHAIN CLOSURE-STANDARD

ITEM	PART NO.	QTY.	DESCRIPTION
1	13846	1	GUARD CHAIN
2	5239	2	CONNECTING LINK, S-HOOK
3	8781	1	CHAIN LINK SNAP



ART980-R2
8912303
3/21/97

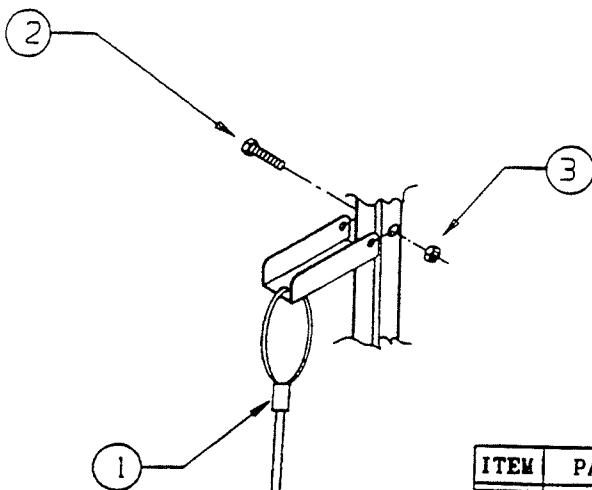
Figure 4-3. 2033ES Rear Gate Assembly



ITEM	PART NO.	QTY.	DESCRIPTION
1	8814	2	ALUMINUM OVAL SLEEVES
2	HDW8486	1	SCREW, 5/16"-18, 1.87 LONG
3	13814	1	HANDLE - ROLLOUT PLATFORM
4	13845	1	SPACER
5	HDW8304	1	LOCKNUT 5/16"-18 GRADE 5
6	13833	1	ACTUATOR ARM
7	7184	3 FT	COATED & ROLLED WIRE CABLE
8	8513	1	SPRING PIN, .125 DIA .75 LONG
9	7031	1	FLAT WASHER, .500 ID, .675 OD
10	7408	1	DECK LOCK SPRING
11	13737	1	EXTENSION LOCK PIN

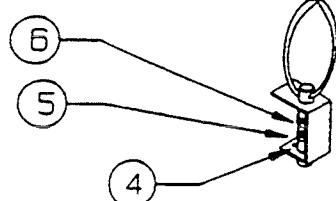
ART561 RO
8M12305
11/5/96

Figure 4-4. 2033ES PLATFORM LOCK ASSEMBLY



FOR DOMESTIC USE:

ITEM	PART NO.	QTY.	DESCRIPTION
1	13896	1	PLATFORM LOCK PIN ASSY
	8814	2	ALUMINUM OVAL SLEEVES
	13814	1	HANDLE - ROLLOUT PLATFORM
	7184	3.2 FT	COATED WIRE CABLE
	13737	1	EXTENSION LOCK PIN
2	HDW8486	1	SCREW, 5/16"-18, 1.87 LONG
3	HDW8304	1	LOCKNUT 5/16"-18 GRADE 5
4	8513	1	SPRING PIN, .125 DIA .75 LONG
5	7031	1	FLAT WASHER, .500 ID, .875 OD
6	7408	1	DECK LOCK SPRING

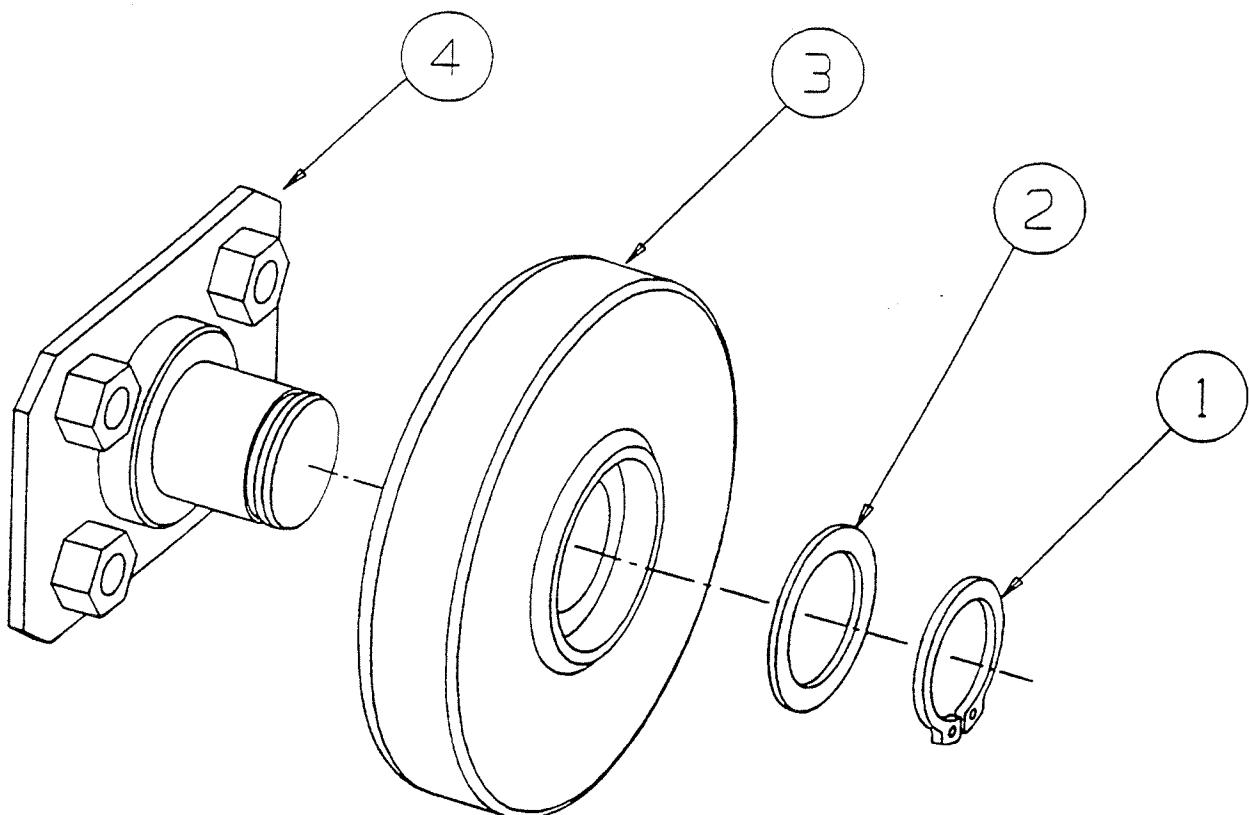


FOR EUROPEAN USE:

ITEM	PART NO.	QTY.	DESCRIPTION
1	13897	1	PLATFORM LOCK PIN ASSY
	8814	2	ALUMINUM OVAL SLEEVES
	13814	1	HANDLE - ROLLOUT PLATFORM
	7184	3.3 FT	COATED WIRE CABLE
	13737	1	EXTENSION LOCK PIN
2	HDW8486	1	SCREW, 5/16"-18, 1.87 LONG
3	HDW8304	1	LOCKNUT 5/16"-18 GRADE 5
4	8513	1	SPRING PIN, .125 DIA .75 LONG
5	7031	1	FLAT WASHER, .500 ID, .875 OD
6	7408	1	DECK LOCK SPRING

ART561 R2
8M12305
2/4/97

Figure 4-4a. 2033ES Platform Lock Assembly



ITEM	PART NO.	QTY.	DESCRIPTION
1	5918	1	RETAINING RING, HEAVY DUTY-1.000-EXT.
2	HDW8370	1	WASHER 1.015 ID X 1.357 OD X .062 THK
3	13230	1	ROLLER
4	13267	1	ROLLER PLATE WELDMENT

Figure 4-5. 2033ES ROLLER BRACKET ASSEMBLY

NOTES



NOTES



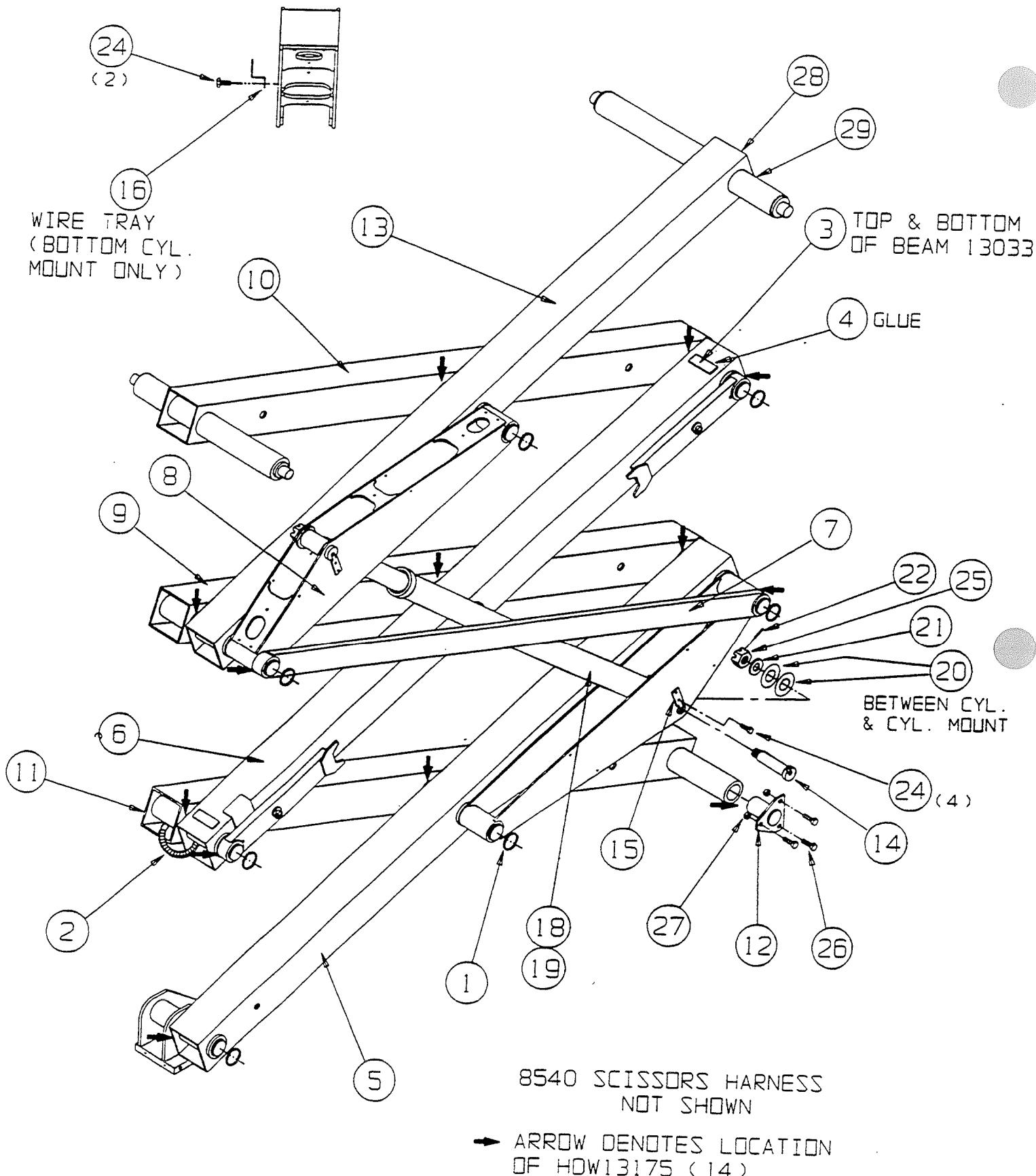
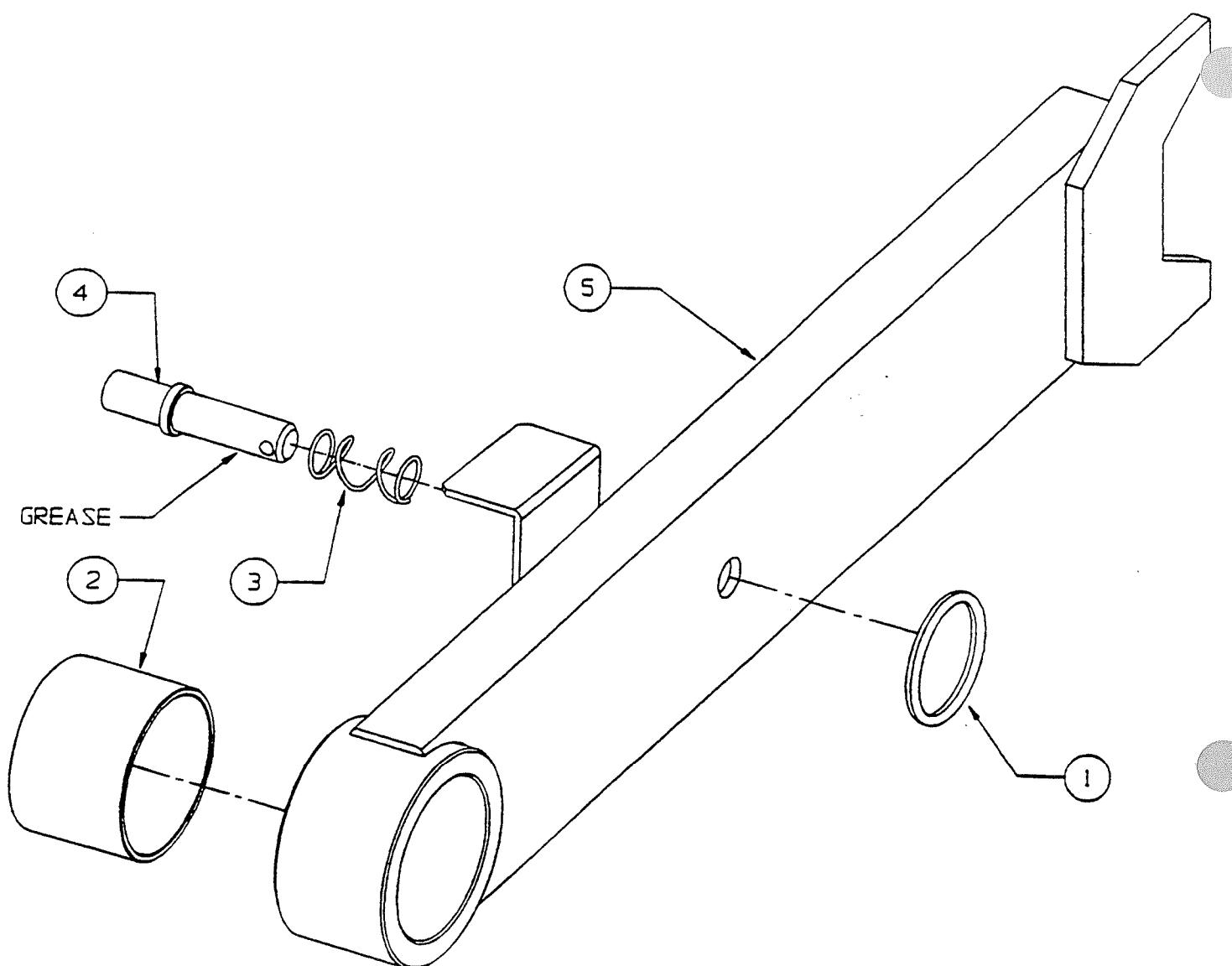


Figure 5-1. Scissor Assembly

ITEM	PART NO.	QTY.	DESCRIPTION
1	6701	8	RETAINING RING - 2" SHAFT
2	6840	4	SPRING
3	8616	4	WEAR PADS (GLUE ON)
4	8617	N/A	GLUE, PERMABOND BLK MAGIC 737
5	13012	1	BEAM WELDMENT OUTER #170
6	13033	1	BEAM WELDMENT #150
7	13931	1	BEAM SUPPORT WELDMENT
8	13054	2	CYL. MOUNT WELDMENT
9	13080	1	BEAM WELDMENT W/PINS #140
10	13942	1	BEAM WELDMENT #120 W/PINS
11	13944	1	BEAM WELDMENT #160 W/PINS
12	13101	2	PIN WELDMENT STAT. MOUNT
13	13943	1	BEAM WELDMENT #130 W/PINS
14	13162	2	CYLINDER MOUNTING PIN
15	13164	2	PIN ACT. PLT-CYL MOUNTING
16	13384	1	TRAY - WIRE - CYL MOUNT
17			
18	8637	1	LIFT CYLINDER
19	13651	1	CYLINDER-LIFT WITH BEARINGS
20	HDW13339	4	WASH 1.385 ID X 2.255 OD X .030 THK
21	HDW3879	2	WASH 1.015 ID X 2.000 OD X .171 THK
22	HDW5787	2	COTTER PIN HAMMERLOC .12Ø 1.50 LG
23			
24	HDW6455	6	SELF TAP SCREW .250-20 .50" GRADE 5
25	HDW6986	2	SLOTTED HEX NUT 1.00-20
26	HDW8283	6	CAP SCREW .500-13 1.50" GRADE 5
27	HDW8457	6	HEX TOP LOC NUT .500-13
28	9147	1	SPRING 1 5/8" X 10" LONG
29	9146	1	CLAMP, 1 13/16", 2 3/4" HOSE

ART579-R5
BM12646
1/4/99

Figure 5-1. Scissor Assembly



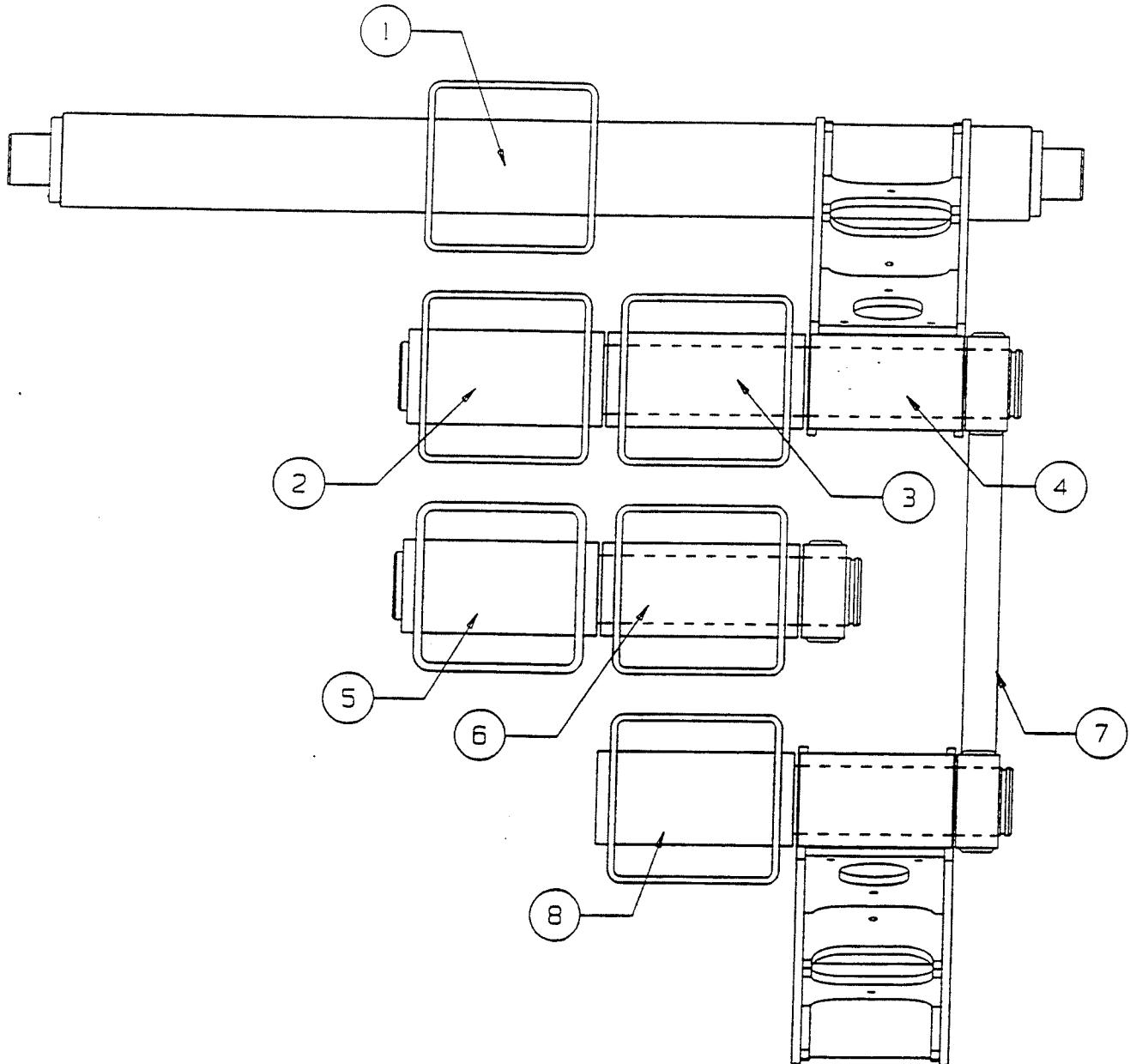
ITEM	PART NO.	QTY.	DESCRIPTION
1	7073	1	RING, SPLIT, 1.640 OD, ZINC
2	8675	1	BEARING, 2.25 OD X 2.00 ID X 1.5 LG
3	8360	1	SPRING, COMP, .60 OD, .50 ID, 1.25 LG.
4	8695	1	PIN, MAINTENANCE LOCK
5	13744	1	MAINTENANCE LOCK WEDIMENT

1. ADD DECALS FOR MODEL 2033ES PER ART 548.

ART564 R0
8M12309
11/6/96

Figure 5-2. 2-33ES MAINTENANCE LOCK ASSEMBLY

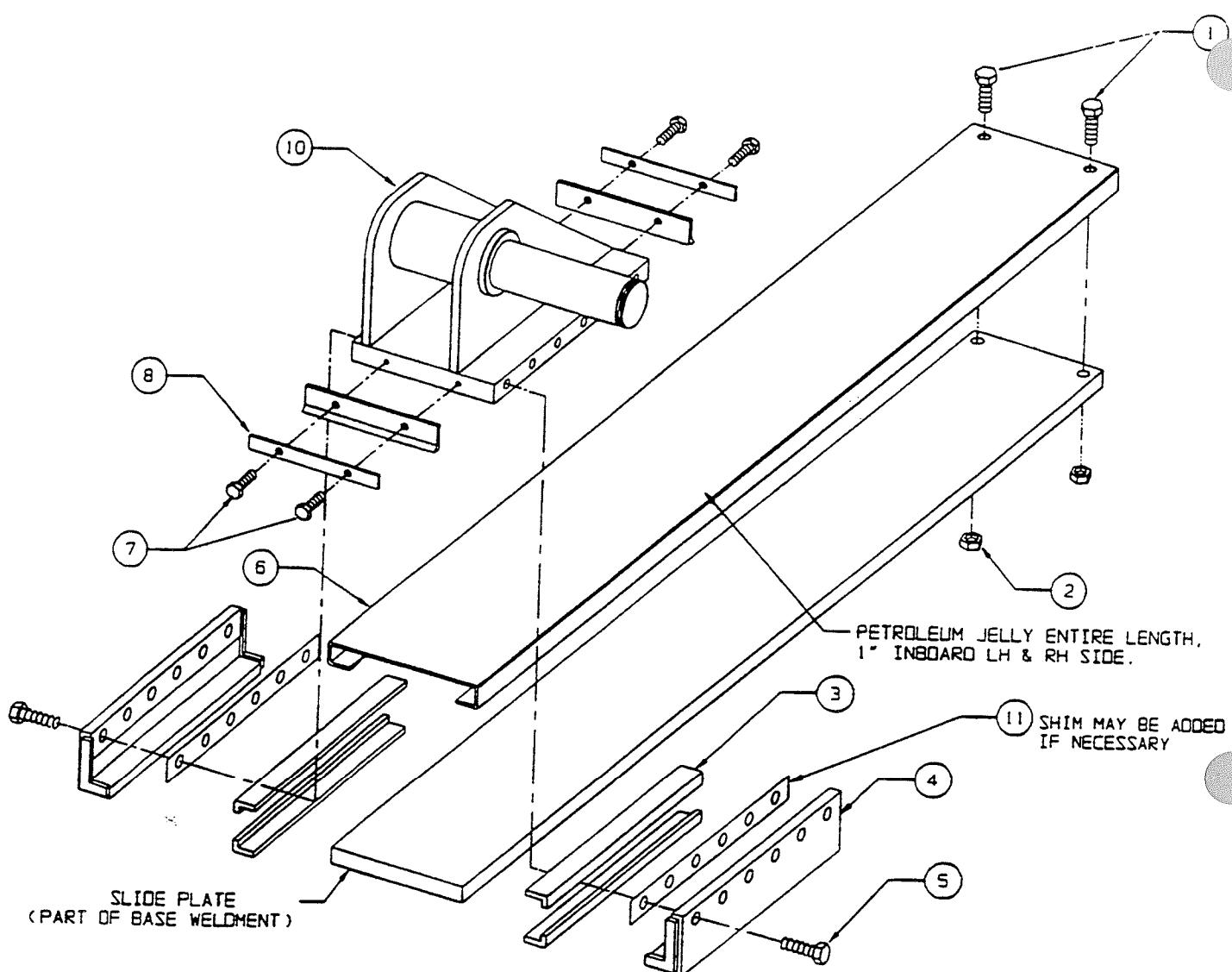
MAYVILLE 2033ES



ITEM	PART NO.	QTY.	DESCRIPTION
1	13942	1	BEAM WELDMENT #120 WITH PINS
2	13080	1	BEAM WELDMENT #140 WITH PINS
3	13943	1	BEAM WELDMENT #130 WITH PINS
4	13054	2	CYLINDER MOUNTING WELDMENT
5	13944	1	BEAM WELDMENT #160 WITH PINS
6	13033	1	BEAM WELDMENT #150
7	13931	1	BEAM SUPPORT WELDMENT
8	13012	1	BEAM WELDMENT OUTER #170

Figure 5-3. Scissor Identification

ART398 RS
BM5860
1/4/99



ITEM	PART NO.	QTY.	DESCRIPTION
1	HDW8310	2	SCREW,CAP,HEX,5/16-18 X 1.25, GRADE 5
2	HDW8304	2	NUT,LOC,HEX,5/16-18
3	8162	4	BEARING, LINEAR SLIDE
4	13687	2	SLIDE SIDE RAIL WELDMENT
5	HDW7990	12	SCREW,CAP,HEX,1/2-13 X 1.25, GRADE 8
6	13552	1	COVER, SLIDE PLATE
7	HDW5723	4	SCREW,SELTAP,HEX,1/4-20 X .75
8	13455	2	WIPER RETAINER SLIDE
9	8487	2	WIPER SLIDE
10	13450	1	SLIDE TOP PLATE WELDMENT
11	13731	2	SHIM, SLIDE

ART372-R7
045261
3/11/96

Figure 5-4. 2033ES SLIDE ASSEMBLY

ITEM	PART NO.	QTY.	DESCRIPTION
1	13807	1	PIN, 2" DIA. X 11.026" LONG
2	8731	2	WIPER, SLIDE
3	HW5723	8	SCREW, 1/4"-20 X 3/4" LONG
4	6701	1	RETAINING RING, 2" SHAFT
5	13782	1	SLIDE SHOE
6	13785	2	SLIDE RETAINER PLATE
7	8901	4	BEARING, LINEAR SLIDE
8	HW8304	2	NUT, 5/16" X 18
9	HW8310	2	SCREW, 5/16" X 18 X 1 1/4" LONG, GRADE 5
10	13552	1	COVER, SLIDE PLATE
11	6984	2	BEARING 220U26

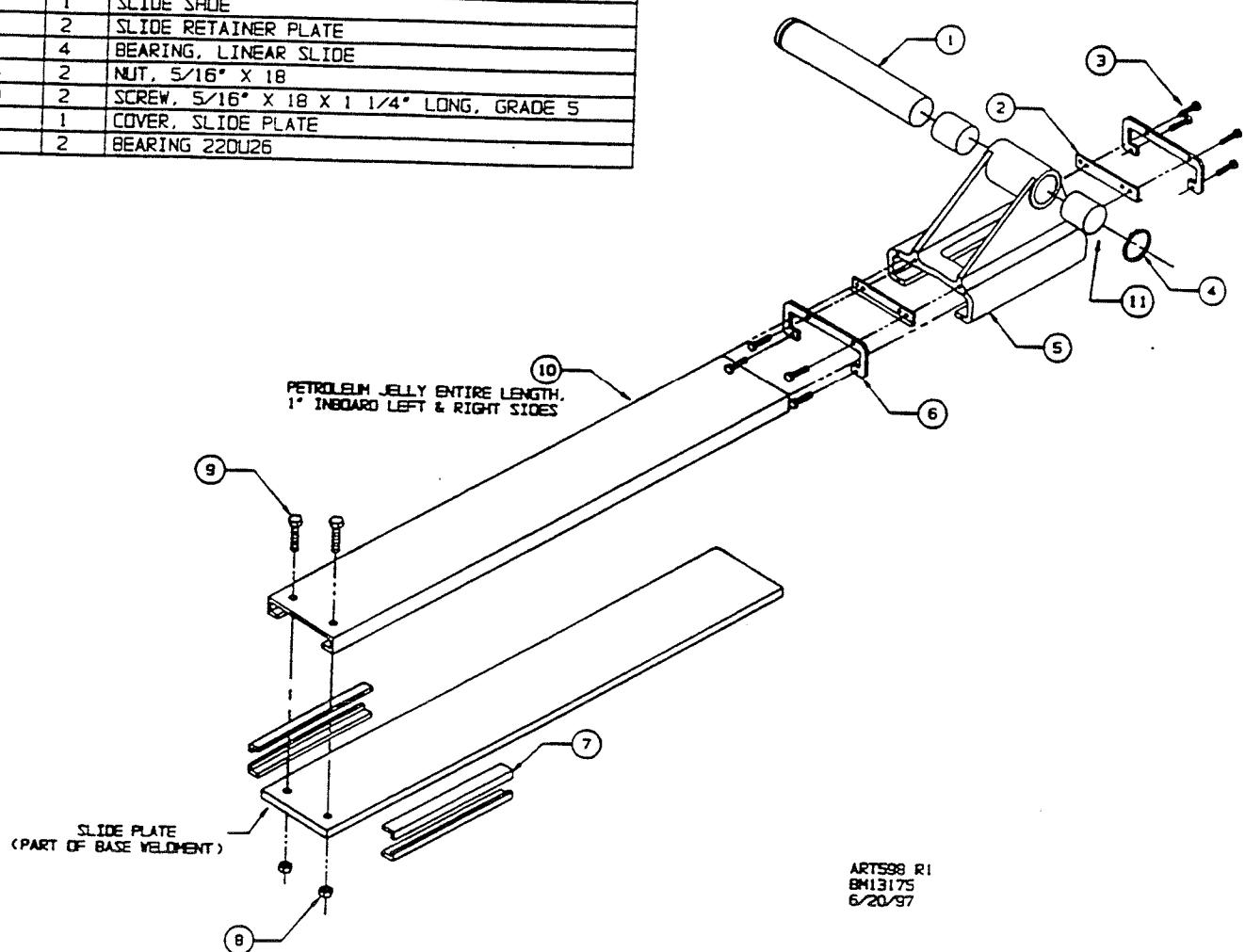


Figure 5-4a. 2033ES Slide Assembly

ITEM	PART NO.	QTY.	DESCRIPTION
1	13807	1	PIN, 2" DIA. X 11.026" LONG
2	8731	2	WIPER, SLIDE
3	HOW5723	8	SCREW, 1/4"-20 X 3/4" LONG
4	6701	1	RETAINING RING, 2" SHAFT
5	13782	1	SLIDE SHOE
6	13785	2	SLIDE RETAINER PLATE
7	8901	4	BEARING, LINEAR SLIDE
8	HOW8304	2	NUT, 5/16" X 18
9	HOW8310	2	SCREW, 5/16" X 18 X 1 1/4" LONG, GRADE 5
10	13552	1	COVER, SLIDE PLATE

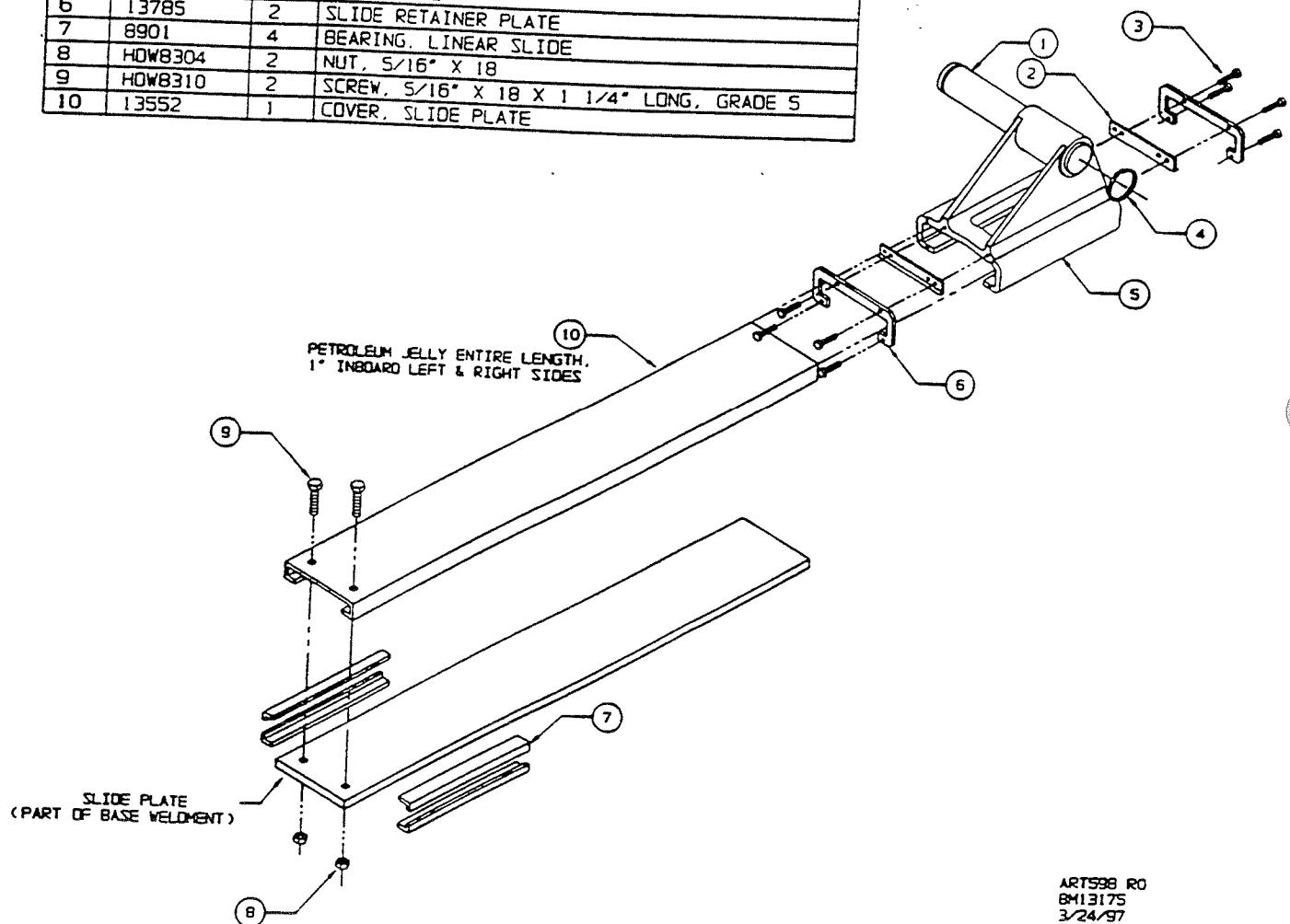
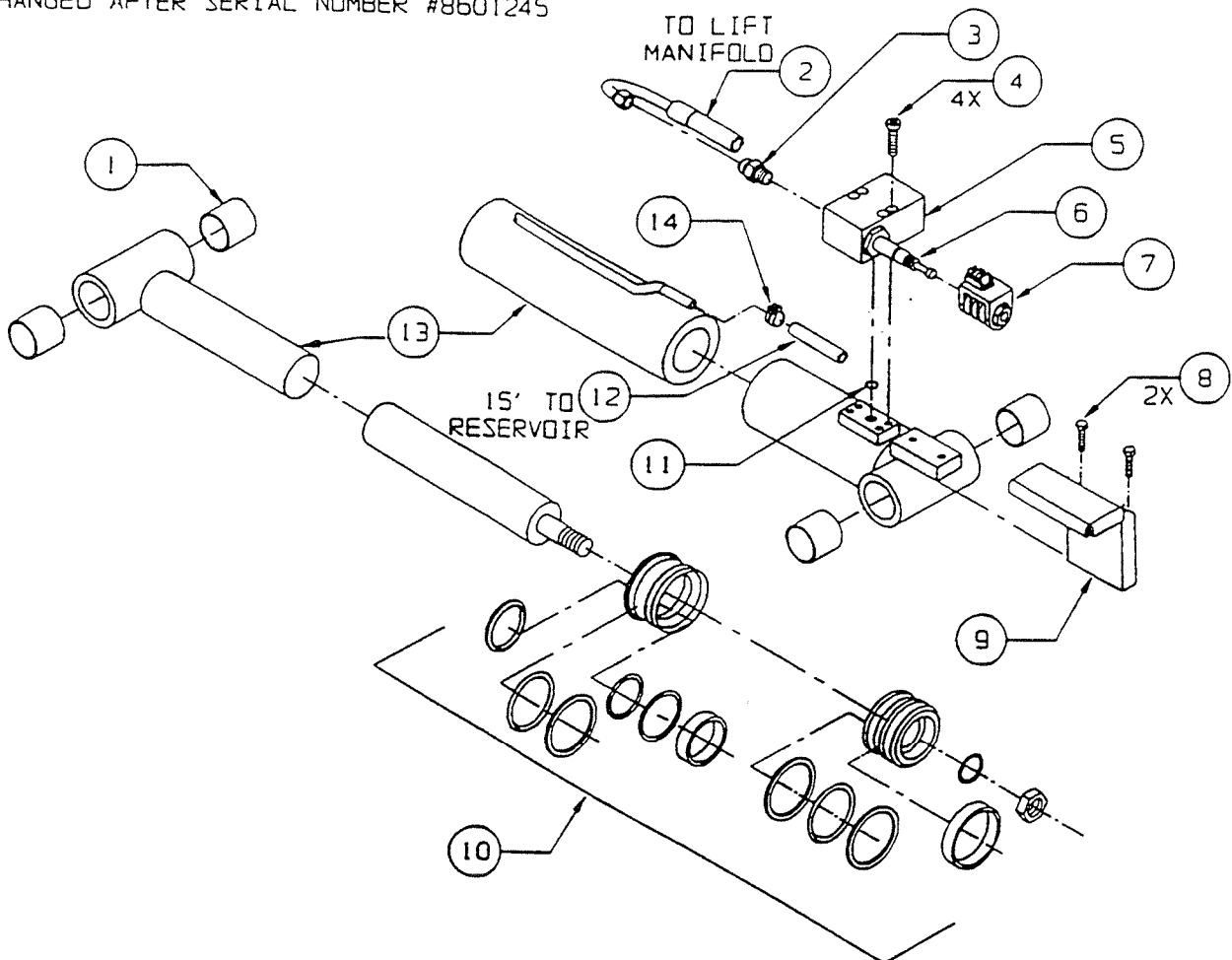


Figure 5-4b. 2033 Slide Assembly

13542 - LIFT CYLINDER W/BEARINGS-US
 13544 - STANDARD OPTION (B)

CHANGED AFTER SERIAL NUMBER #8601245

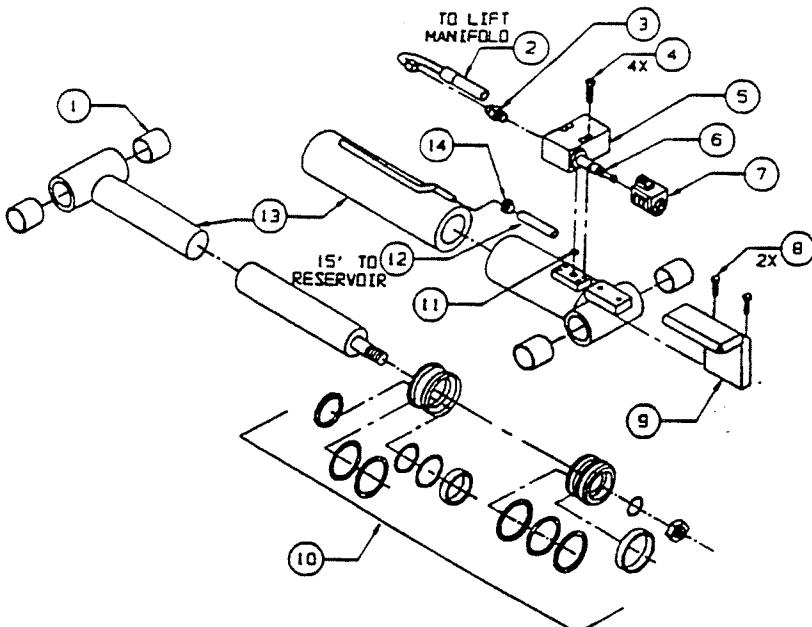


ITEM	PART NO.	QTY.	DESCRIPTION
1	6984	4	BEARING, 220U26, 1 3/8 ID X 1 5/8 LG.
2	8582	1	HOSE, ASSEMBLY, LIFT CYLINDER
3	HW7438	1	FITTING, PIPE, ADAPTOR
4	HW8592	4	SCREW, CAP, SOCKET HD, 1/4-20 X 1.50, GRADE 8
5	13551	1	MANIFOLD, LIFT CYLINDER-STANDARD
6	8595	1	VALVE, 2 WAY, N.C. W/ MANUAL LOCK
7	7833	1	COIL, 24 VOLT, DOUBLE SPADE
8	HW8663	2	SCREW, CAP, HEX HD, 5/16-18 X 50, GRADE 2
9	13728	1	BRACKET, CYLINDER VALVE GUARD WELDMENT
10	7078	1	KIT, SEAL-LIFT CYLINDER (SERVICE)
11	6426	1	O-RING, MANIFOLD BLOCK
12	6458	1	HOSE, RETURN LINE-15 FT.
13	8581	1	CYLINDER, LIFT
14	7788	1	CLAMP, HOSE
N/A	6787	1	HARNESS, WIRE-DOWN, VALVE (NOT SHOWN)
N/A	6840	1	SPRING, (NOT SHOWN)
N/A	13347	1	MANIFOLD ASSEMBLY-LIFT (NOT SHOWN)

ART441-R6
 8M9333
 3/19/96

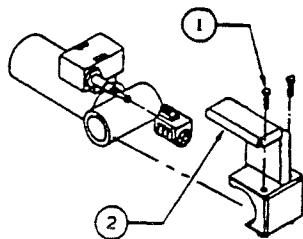
Figure 5-5. 2033ES Lift Cylinder - U.S.

13542 - LIFT CYLINDER W/BEARINGS-US
 13544 - STANDARD OPTION (B)



ITEM	PART NO.	QTY.	DESCRIPTION
1	6984	4	BEARING.22DU26.1 3/8 ID X 1 5/8"LG.
2	8582	1	HOSE, ASSEMBLY, LIFT CYLINDER
3	HOW7438	1	FITTING, PIPE, ADAPTOR
4	HOW8592	4	SCREW,CAP, SOCKET HO, 1/4-20 X 1.50, GRADE 8
5	13551	1	MANIFOLD, LIFT CYLINDER-STANDARD
6	8595	1	VALVE, 2 WAY, N.C. W/ MANUAL LOCK
7	7833	1	COIL, 24 VOLT, DOUBLE SPADE
8	HOW8663	2	SCREW,CAP, HEX HO, 5/16-18 X 50, GRADE 2
9	13728	1	BRACKET, CYLINDER VALVE GUARD WELDMENT
10	7078	1	KIT, SEAL-LIFT CYLINDER (SERVICE)
11	6426	1	O-RING, MANIFOLD BLOCK
12	6458	1	HOSE, RETURN LINE-15 FT.
13	8581	1	CYLINDER, LIFT
14	7788	1	CLAMP, HOSE
N/A	6787	1	HARNESS, WIRE-DOWN, VALVE (NOT SHOWN)
N/A	6840	1	SPRING, (NOT SHOWN)
N/A	13347	1	MANIFOLD ASSEMBLY-LIFT (NOT SHOWN)

13730 - VALVE GUARD,
 LIFT CYL. KIT

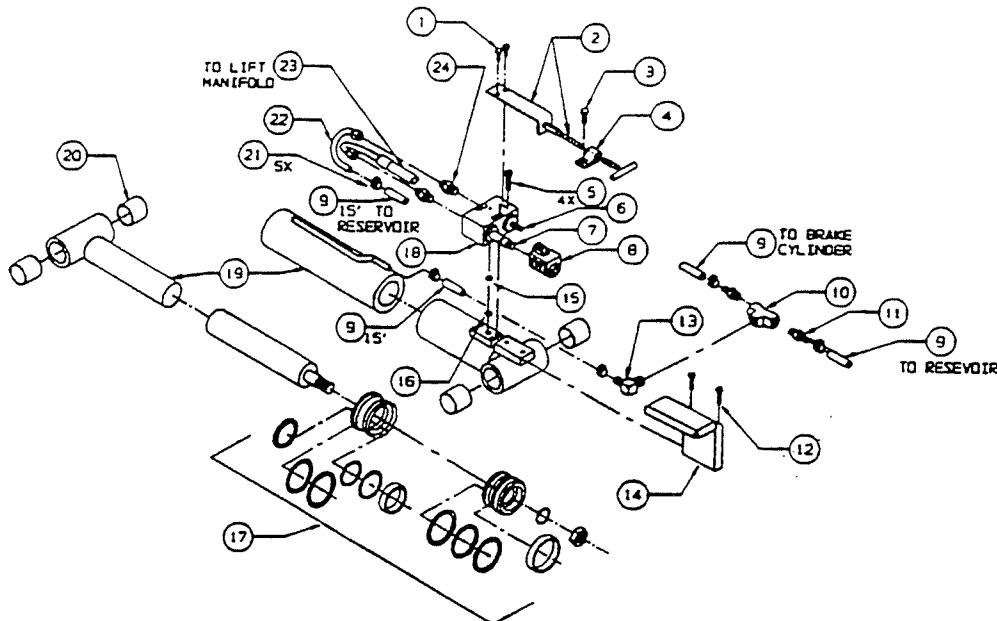


ITEM	PART NO.	QTY.	DESCRIPTION
1	HOW8677	2	SCREW,CAP,HEX HO, 5/16-18 X 3.25, GRADE 5
2	13726	1	VALVE GUARD WELDMENT-LIFT CYLINDER
N/A	8678	2	TERMINAL (NOT SHOWN)
N/A	8682	1	INSTRUCTIONS, LIFT CYLINDER-VALVE GUARD
N/A	5351	4	TIE, WIRE, (NOT SHOWN)

ART441-R6
 BM9333
 3/19/96

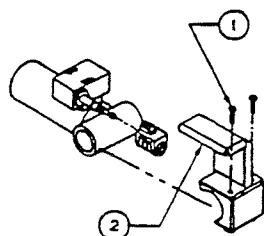
Figure 5-5a. 2033ES LIFT CYLINDER - U.S.

13651 - LIFT CYLINDER W/BEARINGS-EUROPE
13539 - EUROPEAN OPTION



ITEM	PART NO.	QTY.	DESCRIPTION
1	H0W8398	2	SCREW, CAP, HEX HD. 8-32 X 1/2", GRADE 2
2	3251	1	EMERGENCY DOWN ASSEMBLY
3	H0W5723	1	SCREW, SELFTAP & FORM, HEX HD. 1/4"-20 X 3/4"
4	7038	1	CLAMP, EMERGENCY DOWN TUBE
5	H0W8592	4	SCREW, CAP, SOCKET HD. 1/4"-20 X 1 1/2", GRADE 8
6	5435	1	VALVE, MANUAL PULL
7	6973	1	VALVE, N.C. POPPET, 2-WAY
8	7833	1	COIL, 24 VOLT, DOUBLE SPADE
9	6458	4	HOSE, RETURN LINE, 15 FT
10	H0W8591	1	FITTING, PIPE-TEE
11	H0W6459	2	FITTING, PIPE
12	H0W8653	2	SCREW, CAP, HEX HEAD, 3/8"-16 X 1/2", GRADE 2
13	H0W6727	1	FITTING, PIPE, ELBOW, 90 DEG.
14	13728	1	BRACKET, CYLINDER VALVE GUARD WELDMENT
15	H0W8647	1	PLUG, PIPE FITTING
16	6426	1	O-RING, MANIFOLD BLOCK
17	8639	1	KIT, SEAL, LIFT CYLINDER (SERVICE)
18	13535	1	MANIFOLD, LIFT CYLINDER
19	8637	1	CYLINDER, LIFT, EUROPE
20	6984	4	BEARING, 220126, 1 3/8" ID X 1 5/8" LONG
21	7788	5	CLAMP, HOSE
22	8583	1	TUBE, ADAPTOR, RETURN DRAIN
23	8582	1	HOSE ASSEMBLY, LIFT CYLINDER
24	H0W7438	2	FITTING, PIPE ADAPTOR
N/A	6787	1	HARNESS, WIRE DOWN (NOT SHOWN)
N/A	7510	1	SPRING-WIRE PROTECTOR (NOT SHOWN)
N/A	13543	1	MANIFOLD ASSEMBLY (NOT SHOWN)

13730 - VALVE GUARD,
LIFT CYLINDER KIT

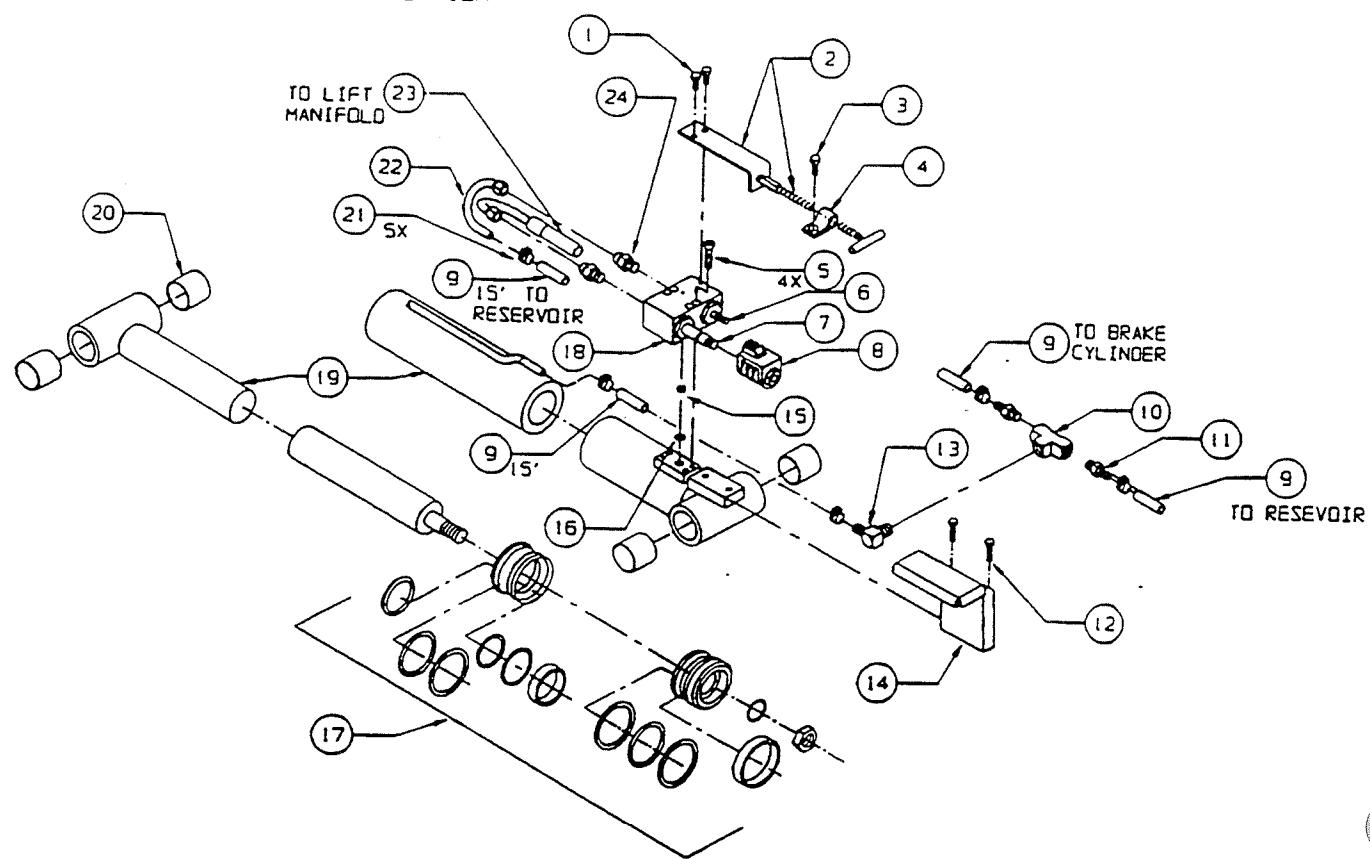


ITEM	PART NO.	QTY.	DESCRIPTION
1	H0W8677	2	SCREW, CAP, HEX HD. 5/16"-18 X 3.25", GRADE 5
2	13726	1	VALVE GUARD WELDMENT-LIFT CYL.
N/A	8678	2	TERMINAL (NOT SHOWN)
N/A	8682	1	INSTRUCTION.. CYLINDER VALVE GUARD
N/A	5351	4	TIE, WIRE (NOT SHOWN)

ART443-R6
8M9675
3/19/96

Figure 5-6. 2033ES LIFT CYLINDER - EUROPE

13651 - LIFT CYLINDER W/BEARINGS-EUROPE
 13539 - EUROPEAN OPTION



ITEM	PART NO.	QTY.	DESCRIPTION
1	HOW8398	2	SCREW, CAP, HEX HD. 8-32 X 1 1/2", GRADE 2
2	3251	1	EMERGENCY DOWN ASSEMBLY
3	HOW5723	1	SCREW, SELFTAP & FORM, HEX HD. 1/4"-20 X 3/4"
4	7038	1	CLAMP, EMERGENCY DOWN TUBE
5	HOW8592	4	SCREW, CAP, SOCKET HD. 1/4"-20 X 1 1/2", GRADE 8
6	5435	1	VALVE, MANUAL PULL
7	6973	1	VALVE, N.C. POPPET, 2-WAY
8	7833	1	COIL, 24 VOLT, DOUBLE SPADE
9	6458	4	HOSE, RETURN LINE, 15 FT
10	HOW8591	1	FITTING, PIPE-TEE
11	HOW6459	2	FITTING, PIPE
12	HOW8663	2	SCREW, CAP, HEX HEAD, 3/8"-18 X 1 1/2", GRADE 2
13	HOW6727	1	FITTING, PIPE, ELBOW, 90 DEG.
14	13728	1	BRACKET, CYLINDER VALVE GUARD WELDMENT
15	HOW8647	1	PLUG, PIPE FITTING
16	6426	1	O-RING, MANIFOLD BLOCK
17	8639	1	KIT, SEAL, LIFT CYLINDER (SERVICE)
18	13535	1	MANIFOLD, LIFT CYLINDER
19	8637	1	CYLINDER, LIFT, EUROPE
20	6984	4	BEARING, 220U26. 1 3/8" ID X 1 5/8" LONG
21	7788	5	CLAMP, HOSE
22	8583	1	TUBE, ADAPTOR, RETURN DRAIN
23	8582	1	HOSE ASSEMBLY, -LIFT CYLINDER
24	HOW7438	2	FITTING, PIPE ADAPTOR
N/A	6787	1	HARNESS, WIRE DOWN (NOT SHOWN)
N/A	7510	1	SPRING-WIRE PROTECTOR (NOT SHOWN)
N/A	13543	1	MANIFOLD ASSEMBLY (NOT SHOWN)

ART443-R6
 BM9675
 3/19/96

Figure 5-6a. 2033ES Lift Cylinder - Europe

NOTES



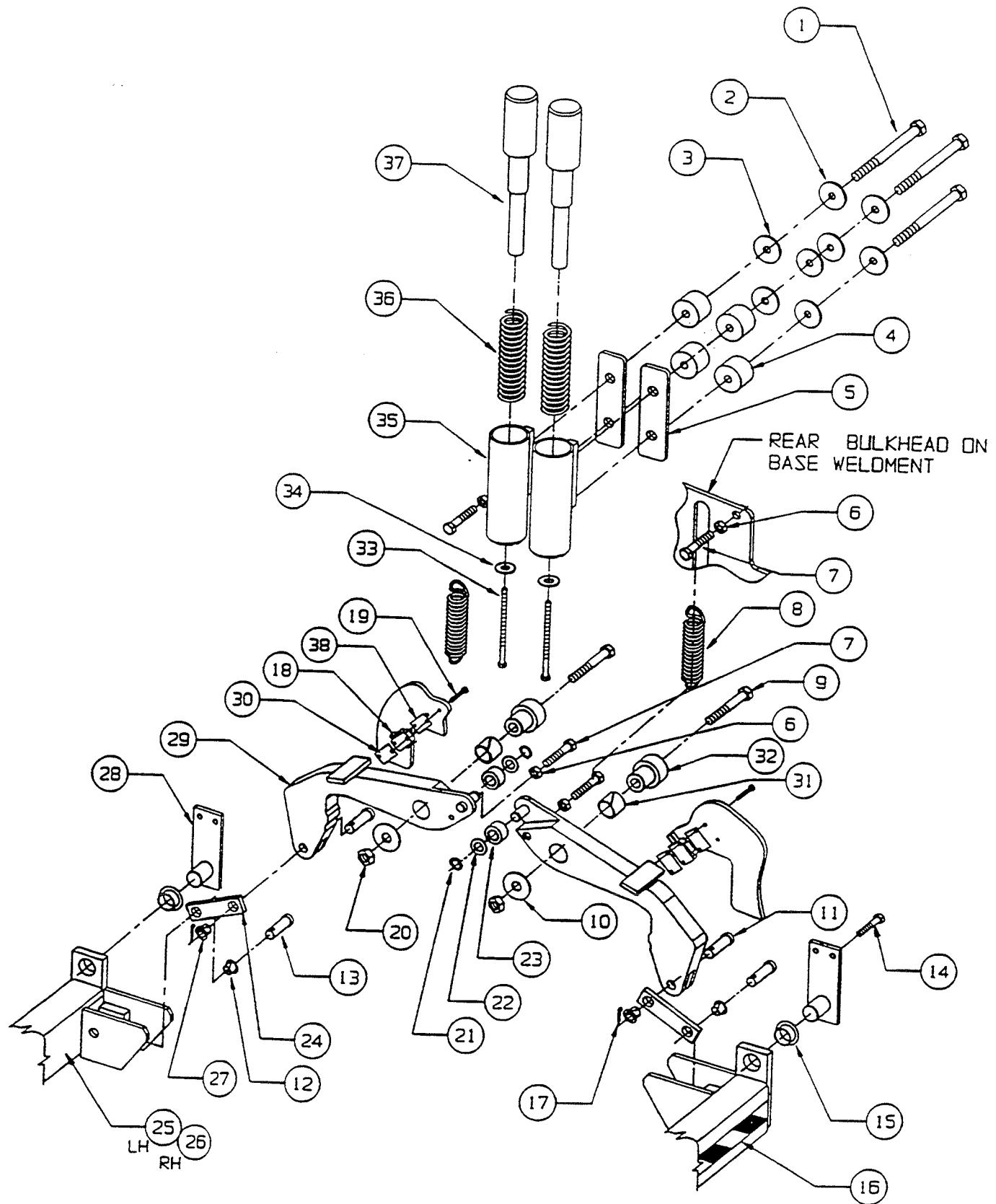


Figure 5-7. 2033es Pothole Bar Mechanism Assembly

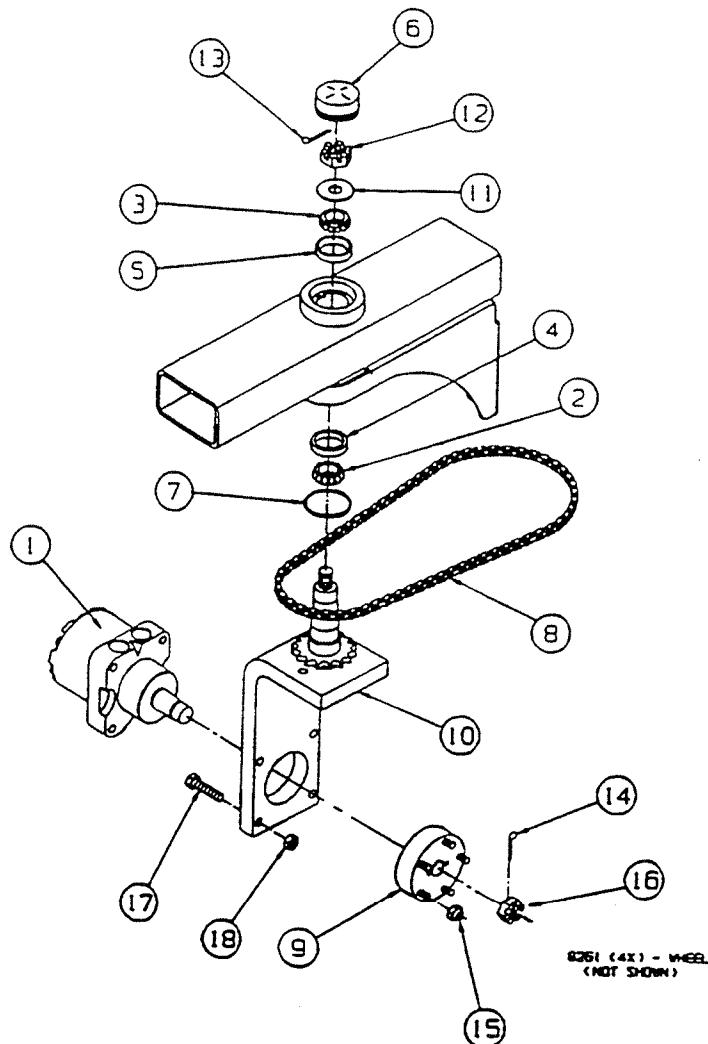
ARTS14-R2
8M11068
5/19/96

ITEM	PART NO.	QTY.	DESCRIPTION
1	HOW8279	4	BOLT, CAP, HEX HD, 3/8 X 16, 2.50 LG, GRADE 5, ZI/CL
2	HOW13338	4	WASHER, FLAT, ID .391, OD 1.524, .127 THK, ZI/YEL
3	HOW13556	4	WASHER, FLAT, PLASTIC, ID .391, OD 1.5, .125 THK
4	8602	4	SPACER, STEPPED, PVC
5	13461	2	PLATE, SLIDE POTHOLE PROT.
6	HOW8312	4	NUT, HEX, 5/16 X 18, CLASS 5, ZI/CL
7	HOW8310	4	BOLT, CAP, HEX HD, 5/16 X 18, 1.25 LG, GR. 5, ZI/CL
8	8226	2	SPRING, TENSION, .75 X .564 X 5, K9.6+3.5
9	HOW7018	2	BOLT, CAP, HEX HD, 1/2 X 13, 3.00 LG, GR.5, ZI/CL
10	HOW13195	2	WASHER, FLAT, ID .515, OD 1.512, .098 THK, ZI/YEL
11	HOW5710	2	PIN, CLEVIS, 1/2 X 1.25 LG, ZI/CL
12	7200	2	BEARING, 1/2 ID X 1/2 LG, NYLINER
13	HOW8179	2	PIN, CLEVIS, 1/2 X 2.62 LG, ZI/YEL
14	HOW8273	8	BOLT, CAP, HEX HD, 1/4 X 20, 1.00 LG, GR. 5, ZI/CL
15	7015	4	BEARING, FLANGED, NYLINER
16	7982	4	OECAL, SAFETY STRIPE
17	HOW5920	4	PIN, COTTER, HAMMERLOCK, 1/8 X 1.00, ZI/CL
18	8696	2	SWITCH, LIMIT, MICRO - V7
19	HOW8732	4	BOLT, MACHINE, RD HD, SLOTTED, 4-40, 1.00 LG, ZI/CL
20	HOW8457	2	NUT, LOC, HEX, 1/2 X 13, CLASS B, ZI/CL
21	5736	2	RING, RETAINING, EXTERNAL, 1/2 SHAFT
22	HOW7031	2	WASHER, FLAT, ID .5, OD .875, .074 THK.. ZI/YEL
23	4542	2	ROLLER
24	13770	2	LINK, POTHOLE
25	13766	1	BAR, POTHOLE, LH
26	13767	1	BAR, POTHOLE, RH
27	8181	2	BEARING, 1/2 X 5/16, NYLINER
28	13178	4	WELDMENT, PIVOT PIN
29	13733	2	WELDMENT, LEVER
30	3765	2	PLATE, STRAP
31	8225	2	BEARING, NYLINER, 16L16
32	13194	2	TUBE, PIVOT-POTHOLE LEVER
33	HOW8494	2	BOLT, TAP, HEX HD, 3/8 X 16, 2.00 LG, GR 5, ZI/CL
34	HOW5355	2	WASHER, FLAT, ID .438, OD 1.00, .078 THK, ZI/CL
35	13464	2	WELDMENT, ACTUATOR SPRING TUBE
36	13478	2	SPRING, COMP, 1.68 X 1.251 X 7.00
37	13548	2	ROD, ACTUATOR, SPRING PLUNGER
38	3764	2	SPACER PLATE

ARTS14-R2
BM11068
6/19/96

Figure 5-7. 2033ES Pothole Bar Mechanism Assembly

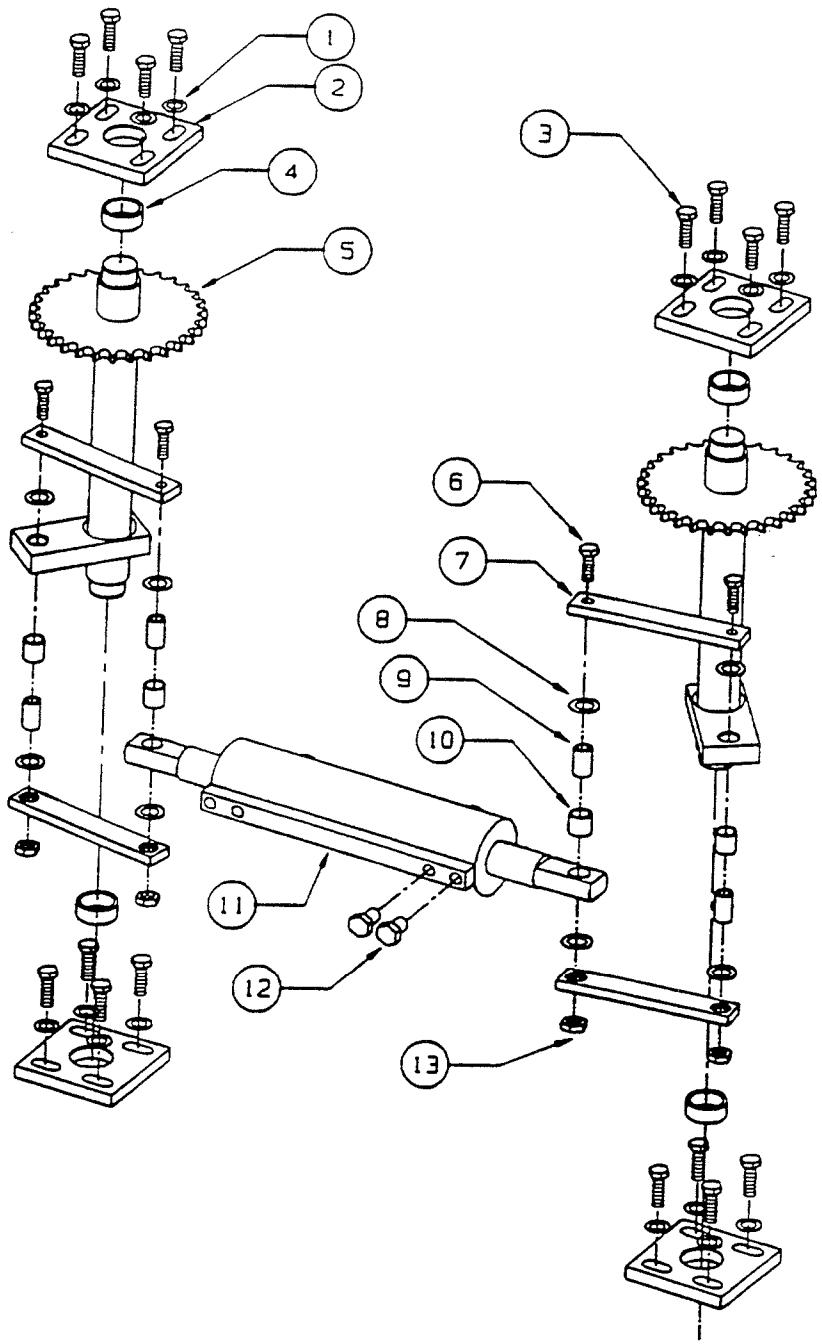
NOTES



ITEM	PART NO.	QTY.	DESCRIPTION
1	8545P	2	HYDRAULIC WHEEL MOTOR - PAINTED
2	7714	2	BEARING, TAPERED ROLL. 1.5" ID
3	7715	2	BEARING, TAPERED ROLL. 1.25" ID
4	7716	2	RACE, BEARING TAPERED
5	7717	2	RACE, BEARING TAPERED
6	7719	2	CAP, GREASE
7	8159	2	SEAL, GREASE 1-3/4" SHAFT
8	8173 6541	2	CHAIN ROLLER #50, 74 LINKS CHAIN LINK CONNECTOR #50 (REPLACEMENT PART)
9	13374	2	FRONT HUB ASSEMBLY
10	13724	2	WHEEL MOTOR BRACKET WELDMENT
11	HOW3801	2	FLAT WASHER, .765 ID X 2.024 00 X .127 THK
12	HOW5737	2	NUT, SLOTTED HEX, .750-16UNC
13	HOW5738	2	COTTER PIN HAMMER LOCK .180 I.50"
14	HOW5787	2	COTTER PIN HAMMER LOCK .120 I.50"
15	HOW6677	10	HEX LUG NUT .500-20
16	HOW6986	2	SLOTTED HEX NUT 1.00-20
17	HOW7018	8	SCREW, CAP, .500-13 X 3.00, GRADE 5
18	HOW8457	8	HEX TOP LOCK NUT .500-13

Figure 6-1. 2033ES Front Axle

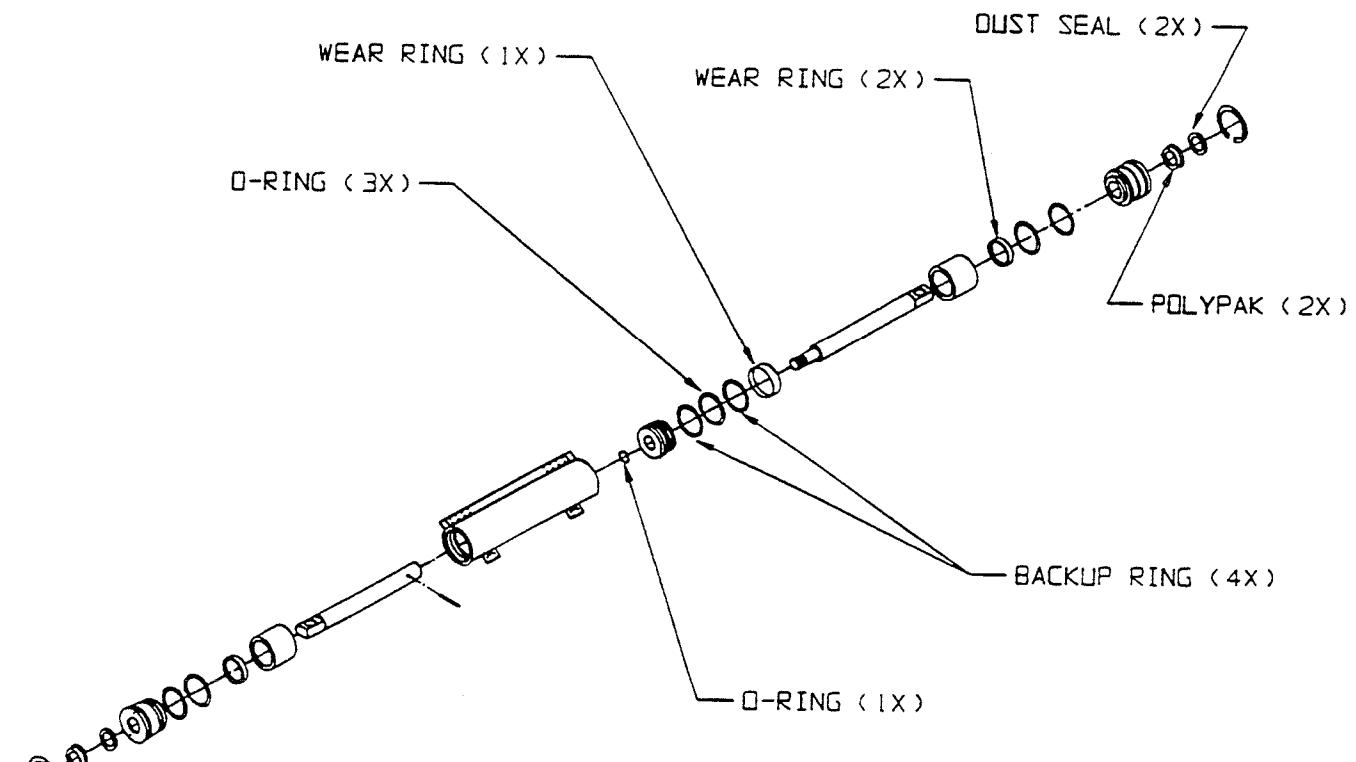
NET 323-47
2/26/87



ITEM	PART NO.	QTY.	DESCRIPTION
1	HDW5216	16	WASHER, FLAT, .531 ID, 1.062 OD, .062 THK
2	13251	4	PLATE, LOWER ADJUST. IDLER SHAFT
3	HDW8283	16	BOLT, CAP, HEX HD, 1/2-13 X 1.50, GRADE 5
4	8248	4	BEARING, OILITE, 1.25 X 5
5	13422	2	STEER IDLER SHAFT WELDMENT
6	HDW6434	4	SCREW, CAP, HEX HEAD, 3/8-16 X 2.00, GRADE 5
7	13419	4	LINK, INTERMEDIATE, STEERING
8	HDW13423	8	WASHER, FLAT, .632 ID, 1.008 OD, .030 THK, NYLON
9	13421	4	SPACER
10	8433	4	BEARING, 100U12
11	8561	1	CYLINDER, DOUBLE END, HYDRAULIC
12	HDW8287	4	BOLT, CAP, HEX HD, 1/2-20 X .75, GRADE 8
13	HDW8268	4	NUT, HEX, LOC, 3/8-16

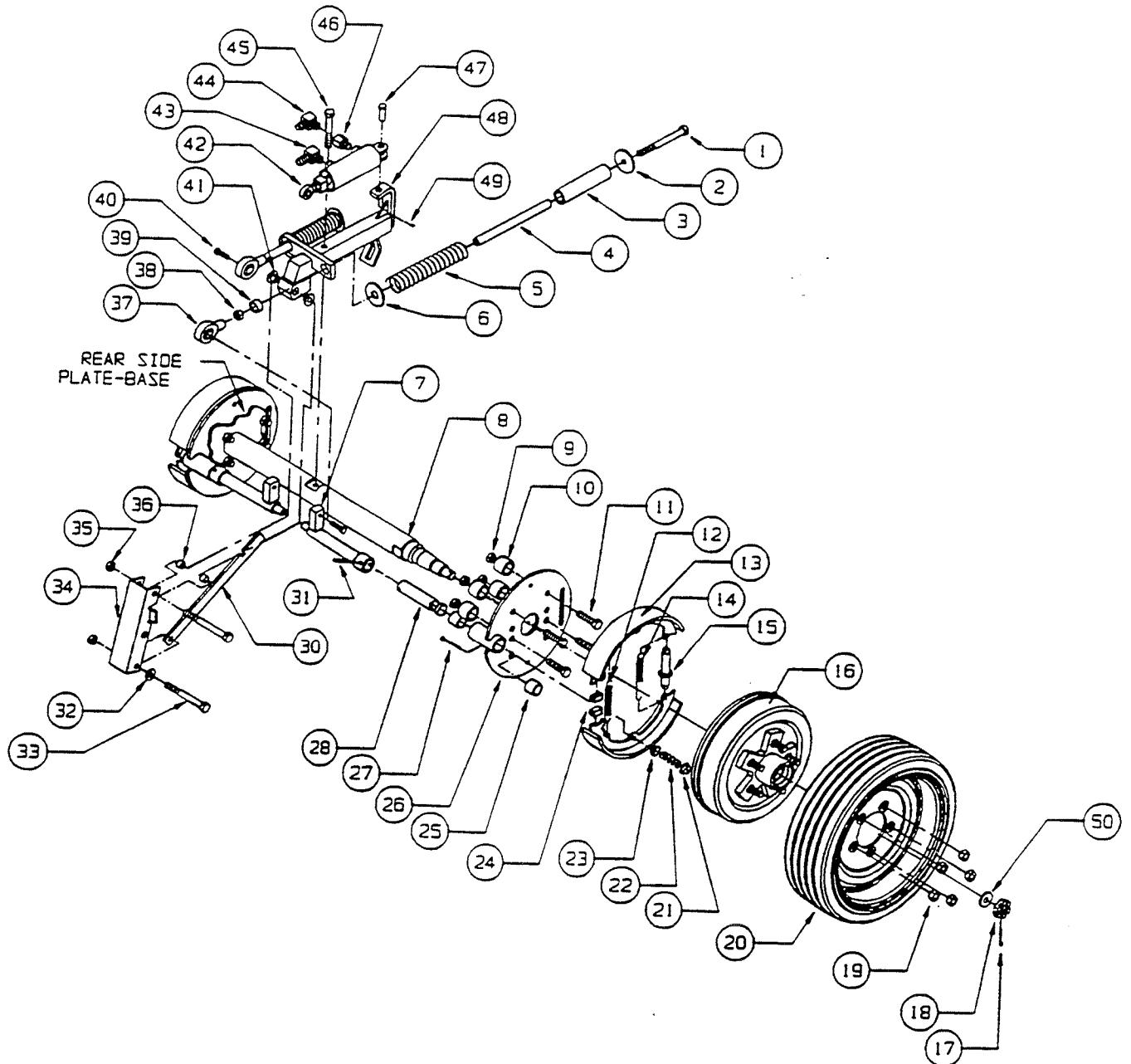
Figure 6-2. 2033ES STEERING ASSEMBLY

COMPLETE CYLINDER 8561 SEAL KIT 8613



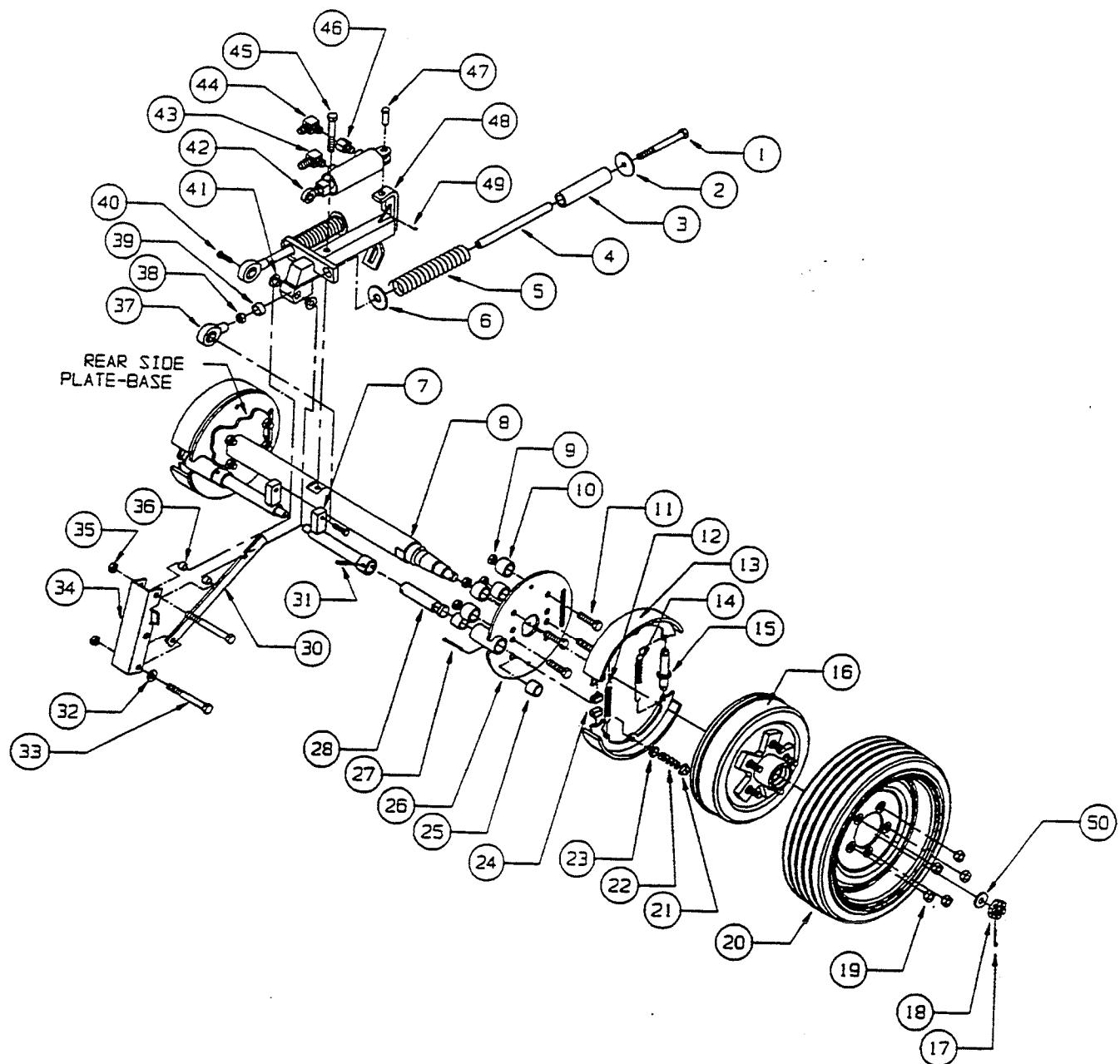
ART453 R1
8M9928
12/27/95

Figure 6-3. 2033ES STEERING CYLINDER



ARTS05-00
8M12325
11/7/95

Figure 6-4. 2033ES REAR AXLE AND BRAKE ASSEMBLY

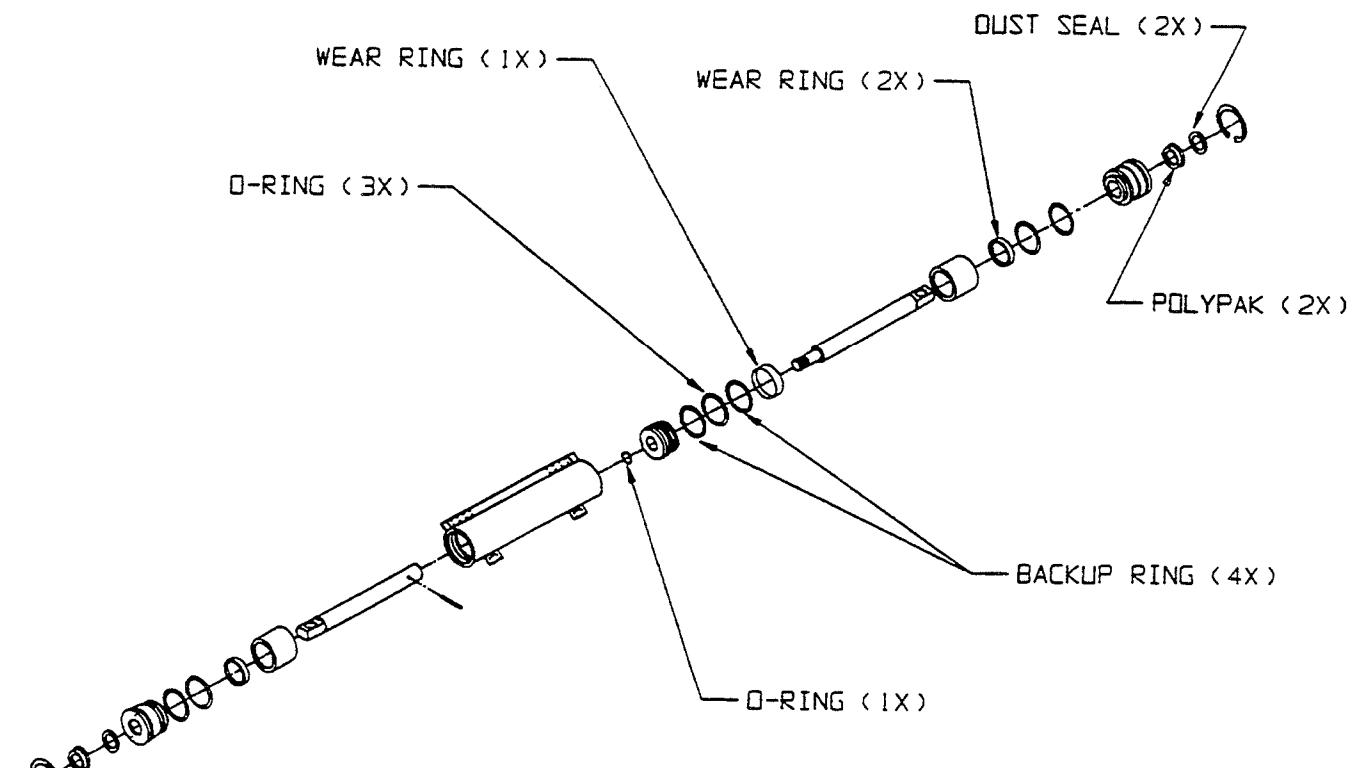


ARTS85-20
8412225
11/7/96

Figure 6-4. 2033ES REAR AXLE AND BRAKE ASSEMBLY

COMPLETE CYLINDER 8561

SEAL KIT 8613



ART453 R1
BM9928
12/27/95

Figure 6-3. 2033ES STEERING CYLINDER

ITEM	PART NO.	QTY.	DESCRIPTION
1	HOW8288	2	BOLT, TAP, 3/8-16 X 3.00, GRADE 5
2	HOW13153	2	WASHER, ID .388, OD 2.112, .127 THK
3	13154	2	TUBE, .891 X 1.315 X 5.422
4	13146	2	ROD, BRAKE SPRING
5	8155P	2	SPRING, COMP, 1.933 X 1.367 X 8.5
6	HOW3801	2	WASHER, ID .765, OD 2.024, .127 THK
7	13529	2	BRAKE ACTUATOR ROD WELDMENT
8	13583	1	REAR AXLE
9	HOW8457	8	NUT, LOC, HEX, 1/2 X 13
10	13135	8	SPACER, BACK PLATE, BRAKE
11	HOW8284	8	BOLT, CAP, HEX HEAD, 1/2-13 X 2.00, GRADE 5
12	6749	2	EXTENSION SPRING, 4.00 LG
13	13090	4	BRAKE PAD WELDMENT
14	7370	2	BRAKE ADJUSTER SPRING
15	7377	2	ADJUSTING SCREW (BRAKE)
16	8704	2	HUB, DRUM W/PACKED BEARINGS
17	HOW5787	2	COTTER PIN, HAMMERLOC, .12 X 1.50
18	HOW5737	2	NUT, SLOTTED, HEX, 3/4X16, GRADE 5
19	HOW6677	20	NUT, LUG, 1/2 X 20, GRADE 5
20	8261	4	WHEEL-TIRE, NONMARKING, 16 X 5 X 11.25
21	7372	4	OUTER HOLD DOWN CUP
22	7374	4	HOLD DOWN SPRING
23	7373	4	INNER HOLD DOWN CUP
24	10090	4	INSERT, BRAKES
25	7092	4	BEARING, 160012, 1 X 3/4
26	13585	2	BRAKE, BACK PLATE WELDMENT
27	7371	4	HOLD DOWN PINS
28	13150	2	ROD, BRAKE CAM
29			
30	13231	1	BRAKE LOCKOUT LEVER
31	HOW6729	2	PIN, SLOTTED, SPRING, 1/4 X 1.37
32	HOW5355	1	WASHER, .438 ID, 1.000 OD, .078 THK
33	HOW8311	2	BOLT, CAP, HEX HEAD, 7/16-14 X 2.50, GRADE 5
34	13144	1	ACTUATOR BRAKE BRACKET
35	HOW8269	2	NUT, LOC, HEX, 7/16 X 14
36	13209	2	SPACER, ID .465, OD .562
37	5679	2	ROD END, STEERING
38	HOW8265	2	NUT, HEX, 3/8 X 24, GRADE 5
39	8190	2	BEARING, BRONZE, .75 ID X .5
40	HOW8276	2	BOLT, CAP, HEX HEAD, 3/8-16 X 1.25, GRADE 5
41	8187	2	BEARING, NYLINER, .63 ID X .63 LF
42	13174	1	HYDRAULIC BRAKE CYLINDER ASSEMBLY, 2" STROKE
	13157	1	ROD CYLINDER, BRAKE
2485		1	CYLINDER WELDMENT, BRAKE
2493		1	CYLINDER HEAD
2494		1	PISTON, CYLINDER
5947		1	SEAL KIT, FOR 5677 & 5678
6337		1	INTERNAL RETAINING RING
8163		1	ROD END, MALE, 7/16-20
HOW6338		1	NUT, LOC, HEX, 1/2 X 20
HOW8266		1	NUT, HEX, 7/16 X 20, GRADE 5
43	HOW6727	1	ELBOW, 90 DEG, .25 PIPE THREAD
44	HOW7500	1	ELBOW, 90 DEG, .25 PIPE THREAD
45	HOW6435	1	BOLT, CAP, HEX HEAD, 1/2-13 X 2.50, GRADE 5
46	HOW7044	1	PIPE FITTING, SWIVEL, .25 PIPE THREAD
47	HOW5710	1	CLEVIS PIN, .5 X 1.25 LG, ZI/CL
48	13528	1	BRAKE ACTUATOR MOUNT, WELDMENT
49	HOW5920	1	COTTER PIN, HAMMERLOC, .12 X 1.00
50	HOW3799	2	WASHER, ID .767, OD 1.500, .134 THK

Figure 6-4. 2033ES REAR AXLE AND BRAKE ASSEMBLY

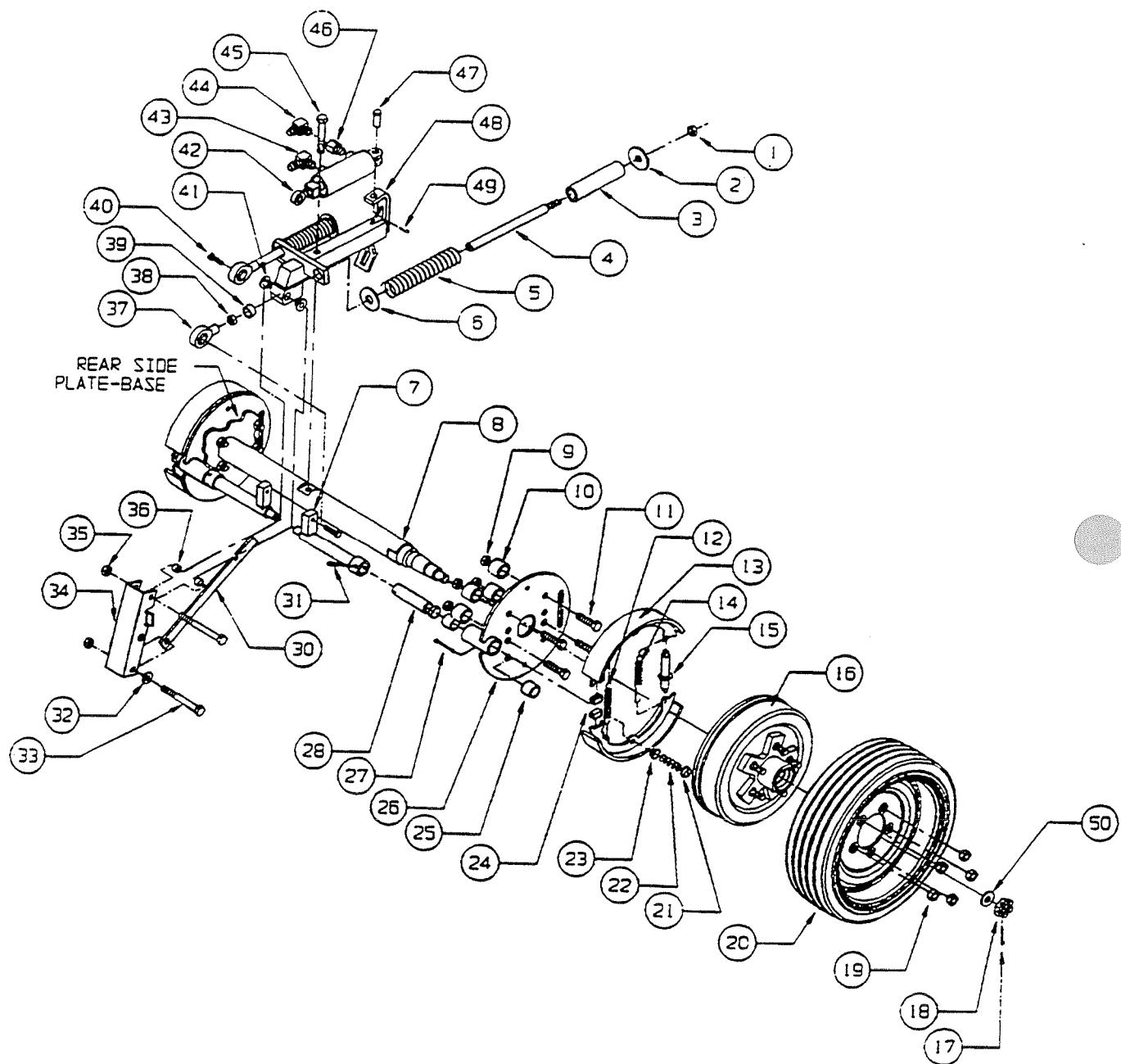


Figure 6-4a. 2033ES Rear Axle and Brake Assembly

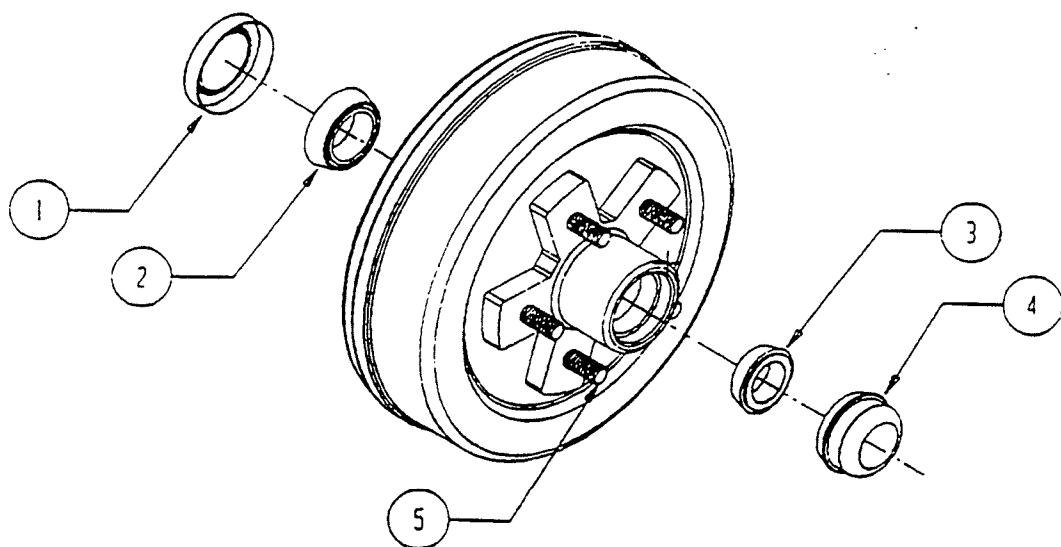
AD7555-R1
BH12325
3/8/96

ITEM	PART NO.	QTY.	DESCRIPTION
1	-DW8309	2	NUT, 7/16" - 14
2	HDW13929	2	WASHER, ID .472, OD 2.110, .135 THICK
3	13154	2	TUBE, .091 X 1.315 X 5.422
4	13723	2	ROD, BRAKE SPRING
5	8155P	2	SPRING, COMP, 1.933 X 1.367 X .85
6	HDW3801	2	WASHER, ID .765, OD 2.024, .127 THK
7	13529	2	BRAKE ACTUATOR ROD WELDMENT
8	13583	1	REAR AXLE
9	HDW8457	8	NUT, LOC, HEX, 1/2 X 13
10	13135	8	SPACER, BACK PLATE, BRAKE
11	HDW8284	8	BOLT, CAP, HEX HEAD, 1/2-13 X 2.00, GRADE 5
12	6749	2	EXTENSION SPRING, 4.00 LG
13	13090	4	BRAKE PAD WELDMENT
14	7370	2	BRAKE ADJUSTER SPRING
15	7377	2	ADJUSTING SCREW (BRAKE)
16	8704	2	HUB, DRUM W/PACKED BEARINGS
17	HDW5787	2	COTTER PIN, HAMMERLOC, .12 X 1.50
18	HDW5737	2	NUT, SLOTTED, HEX, 3/4X16, GRADE 5
19	HDW6677	20	NUT, LUG, 1/2 X 20, GRADE 5
20	8261	4	WHEEL-TIRE, NONMARKING, 16 X 5 X 11.25
21	7372	4	OUTER HOLD DOWN CUP
22	7374	4	HOLD DOWN SPRING
23	7373	4	INNER HOLD DOWN CUP
24	10090	4	INSERT, BRAKES
25	7092	4	BEARING, 160012, 1 X 3/4
26	13585	2	BRAKE, BACK PLATE WELDMENT
27	7371	4	HOLD DOWN PINS
28	13150	2	ROD, BRAKE CAM
29			
30	13231	1	BRAKE LOCKOUT LEVER
31	HDW6729	2	PIN, SLOTTED, SPRING, 1/4 X 1.37
32	HDWS355	1	WASHER, .438 ID, 1.000 OD, .078 THK
33	HDW8311	2	BOLT, CAP, HEX HEAD, 7/16-14 X 2.50, GRADE 5
34	13144	1	ACTUATOR BRAKE BRACKET
35	HDW8269	2	NUT, LOC, HEX, 7/16 X 14
36	13209	2	SPACER, ID .465, OD .562
37	5679	2	ROD END, STEERING
38	HDW8265	2	NUT, HEX, 3/8 X 24, GRADE 5
39	8190	2	BEARING, BRONZE, .75 ID X .5
40	HDW8276	2	BOLT, CAP, HEX HEAD, 3/8-16 X 1.25, GRADE 5
41	8187	2	BEARING, NYLiner, .63 ID X .63 LF
42	13174	1	HYDRAULIC BRAKE CYLINDER ASSEMBLY, 2" STROKE
	13157	1	ROD CYLINDER, BRAKE
	2485	1	CYLINDER WELDMENT, BRAKE
	2493	1	CYLINDER HEAD
	2494	1	PISTON, CYLINDER
	5947	1	SEAL KIT, FOR 5677 & 5678
	6337	1	INTERNAL RETAINING RING
	8163	1	ROD END, MALE, 7/16-20
	HDW6338	1	NUT, LOC, HEX, 1/2 X 20
	HDW8266	1	NUT, HEX, 7/16 X 20, GRADE 5
43	HDW6727	1	ELBOW, 90 DEG, .25 PIPE THREAD
44	HDW7500	1	ELBOW, 90 DEG, .25 PIPE THREAD
45	HDW6435	1	BOLT, CAP, HEX HEAD, 1/2-13 X 2.50, GRADE 5
46	HDW7044	1	PIPE FITTING, SWIVEL, .25 PIPE THREAD
47	HDW5710	1	CLEVIS PIN, 5 X 1.25 LG, ZINC
48	13528	1	BRAKE ACTUATOR MOUNT, WELDMENT
49	HDW5920	1	COTTER PIN, HAMMERLOC, .12 X 1.00
50	HDW3799	2	WASHER, ID .767, OD 1.500, .134 THK

ARTS65-R1
BM12325
3/6/98

Figure 6-4a. 2033ES Rear Axle and Brake Assembly

8972 DRUM & HUB
W/ PACKED BEARINGS

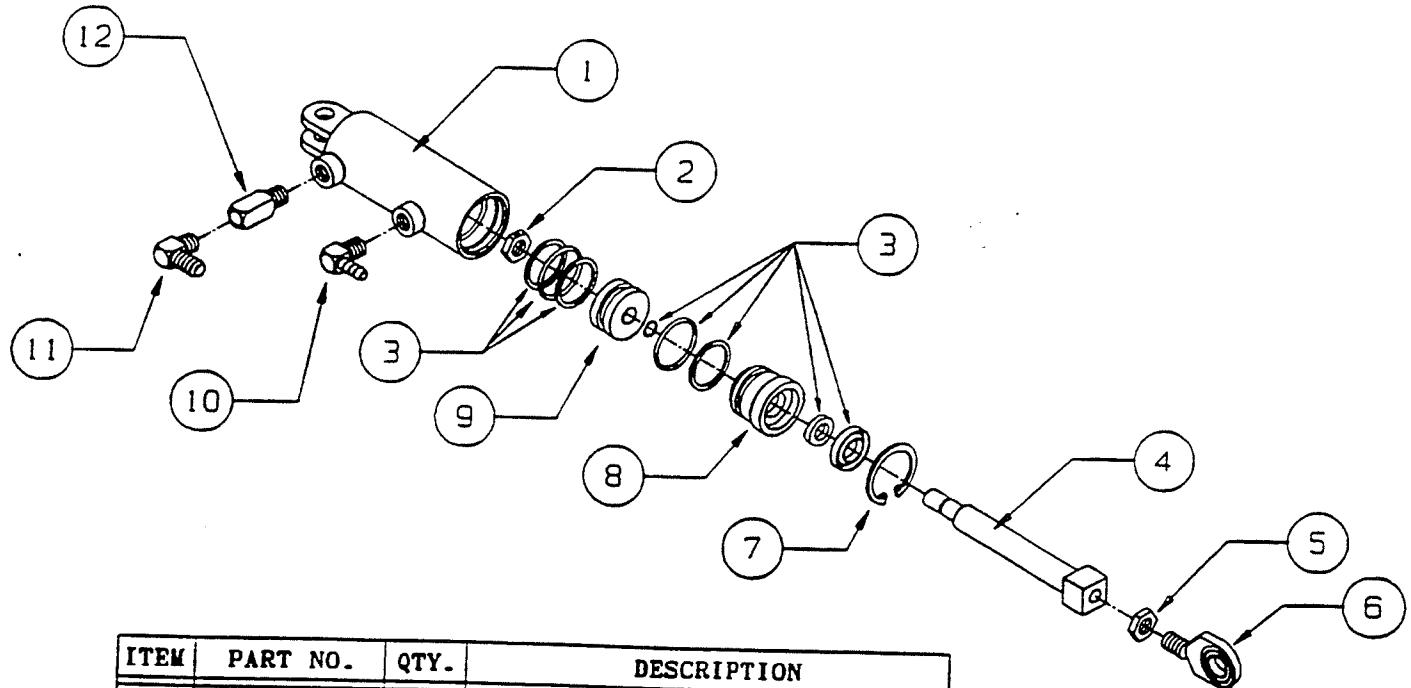


ITEM	PART NO.	QTY.	DESCRIPTION
1	8159	1	SEAL, GREASE, 1-3/4" SHAFT
2	8158	1	BEARING, TAPERED ROLLER, 1-3/8"
3	7932	1	BEARING, TAPERED, RI 1/16 BORE
4	8156	1	CAP, GREASE
5	8705	5	PRESSED STUD, 1/2-20 X 60 DEG. -UNF

ART439 R3
BM9300
5/14/98

Figure 6-5. 2033ES Brake Drum Hub Assembly

13174 - BRAKE CYLINDER ASSEMBLY



ITEM	PART NO.	QTY.	DESCRIPTION
1	2485	1	CYLINDER-BRAKE WELDMENT
2	HDW6338	1	NUT, LOC, HEX, 1/2"-20, CLASS 8
3	5947	1	KIT, SEAL FOR 5677 & 5678
4	13157	1	ROD, CYLINDER-BRAKE
5	HDW8266	1	NUT, HEX, 7/16"-20, GRADE 5
6	8163	1	ROD END, MALE, 7/16"-20
7	6337	1	RETAINING RING, INTERNAL
8	2493	1	CYLINDER HEAD
9	2494	1	PISTON, CYLINDER
10	HDW6727	1	FITTING, PIPE, 90 DEG, ELBOW, MALE
11	HDW7500	1	FITTING, PIPE, 90 DEG, ELBOW, MALE
12	HDW7044	1	FITTING, PIPE, UNION, FEMALE

ART486-R1
B&I 0645
2/14/96

Figure 6-6. 2033ES BRAKE CYLINDER ASSEMBLY

NOTES

NOTES



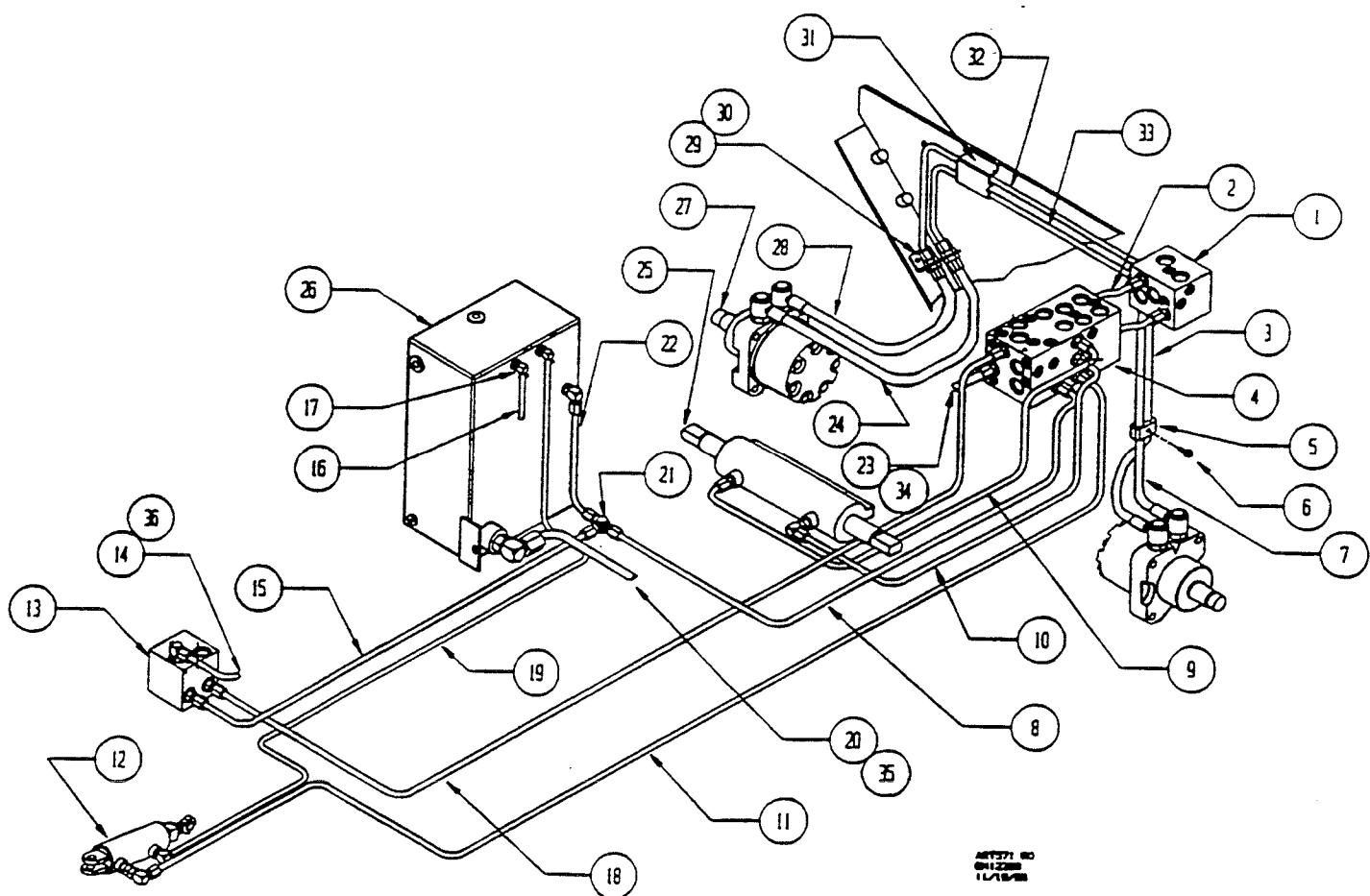
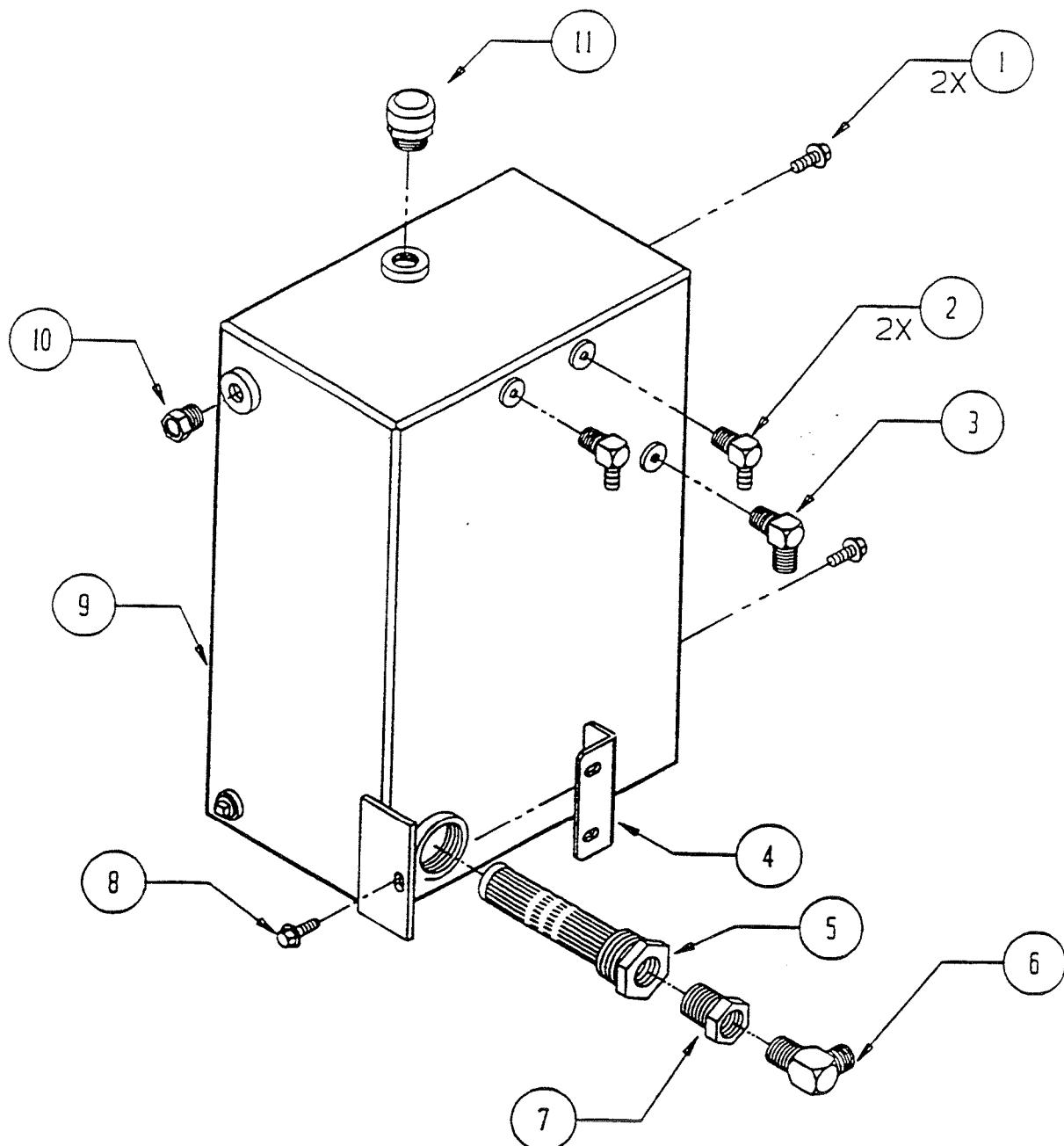


Figure 7-1. 2033ES HYDRAULIC SYSTEM LAYOUT

ITEM	PART NO.	QTY.	DESCRIPTION
1	13860	1	DRIVE MANIFOLD
2	8333	2	HYDRAULIC TUBE ASSEMBLY #1
3	8322	1	HOSE ASSEMBLY-DRIVE MANIFOLD TO RH WHEEL MOTOR 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 90 DEG O-RING SWIVEL 7/8-14 THREAD 3/8 ID HOSE X 33" LONG-3000 PSI. EXCEEDS SAE 100R1
4	13863	1	MAIN MANIFOLD
5	6064	1	CLAMP
6	HOW6029	1	BOLT, SELF TAP, 1/4-20 X 1.50, GRADE 5
7	8321	1	HOSE ASSEMBLY-DRIVE MANIFOLD TO RH WHEEL MOTOR 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 90 DEG O-RING SWIVEL 7/8-14 THREAD 3/8 ID HOSE X 28" LONG-3000 PSI. EXCEEDS SAE 100R1
8	8320	1	HOSE ASSEMBLY-RETURN, MAIN MANIFOLD TO TEE FITTING 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 37 DEG FEMALE SWIVEL, 90 DEG TUBE ELBOW, 9/16-18 THREAD 3/8 ID HOSE X 34" LONG-3000 PSI. EXCEEDS SAE 100R1
9	8316	1	HOSE ASSEMBLY-MAIN MANIFOLD TO STEERING CYLINDER LH 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 37 DEG FEMALE SWIVEL, 90 DEG TUBE ELBOW 9/16-18 THREAD 1/4 ID HOSE X 38" LONG-3000 PSI. EXCEEDS SAE 100R1
10	8315	1	HOSE ASSEMBLY-MAIN MANIFOLD TO STEERING CYLINDER RH 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 37 DEG FEMALE SWIVEL, 90 DEG TUBE ELBOW 9/16-18 THREAD 1/4 ID HOSE X 22" LONG-3000 PSI. EXCEEDS SAE 100R1
11	8323	1	HOSE ASSEMBLY-MAIN MANIFOLD TO BRAKE CYLINDER 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 37 DEG FEMALE SWIVEL, 90 DEG TUBE ELBOW 9/16-18 THREAD 1/4 ID HOSE X 84" LONG-3000 PSI. EXCEEDS SAE 100R1
12	13174	1	HYDRAULIC BRAKE CYLINDER ASSEMBLY-2" STROKE
13	13347	1	LIFT MANIFOLD
14	8582	1	HOSE ASSEMBLY-LIFT MANIFOLD TO LIFT CYLINDER 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 37 DEG FEMALE SWIVEL, 180 DEG SPECIAL TUBE, 9/16-18 THREAD 3/8 ID HOSE X 118" LONG-3000 PSI. EXCEEDS SAE 100R1
15	8334	1	HYDRAULIC TUBE ASSEMBLY #2
16	6458	15 FT	RETURN LINE HOSE-BREATHER FROM LIFT CYLINDER-5/16 ID
17	7164	2	HOSE CLAMP, 5/16 ID HOSE
18	8587	1	HOSE ASSEMBLY-MAIN MANIFOLD TO LIFT MANIFOLD 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 37 DEG FEMALE SWIVEL, 90 DEG TUBE ELBOW 9/16-18 THREAD 3/8 ID HOSE X 65" LONG-3000 PSI. EXCEEDS SAE 100R1
19	6458	7 FT	RETURN LINE HOSE-BRAKE CYLINDER TO RESEVOIR, 5/16 ID
20	8317	1	HOSE ASSEMBLY-SUPPLY, TANK TO PUMP 37 DEG STRAIGHT FEMALE SWIVEL 3/4-16 THREAD 37 DEG STRAIGHT FEMALE SWIVEL, 3/4-16 THREAD 1/2 ID HOSE X 19" LONG-3000 PSI. EXCEEDS SAE 100R1
21	HOW7391	1	TEE PIPE FITTING 0.37
22	7365	1	HYDRAULIC TUBE ASSEMBLY #40
23	8586	1	HOSE ASSEMBLY-MAIN MANIFOLD TO MOTOR AND PUMP 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 37 DEG FEMALE SWIVEL, 90 DEG TUBE ELBOW 9/16-18 THREAD 3/8 ID HOSE X 20" LONG-3000 PSI. EXCEEDS SAE 100R1
24	8407	1	HOSE ASSEMBLY-BULKHEAD FITTING TO LH WHEEL MOTOR 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 90 DEG O-RING SWIVEL 7/8-14 THREAD 3/8 ID HOSE X 26" LONG-3000 PSI. EXCEEDS SAE 100R1
25	13436	1	STEERING CYLINDER ASSEMBLY-DOUBLE END
26		1	RESERVOIR ASSEMBLY
27	8545P	2	HYDRAULIC WHEEL MOTOR-PAINTED
28	8408	1	HOSE ASSEMBLY-BULKHEAD FITTING TO LH WHEEL MOTOR 37 DEG STRAIGHT FEMALE SWIVEL 9/16-18 THREAD 90 DEG O-RING SWIVEL 7/8-14 THREAD 3/8 ID HOSE X 22" LONG-3000 PSI. EXCEEDS SAE 100R1
29	HOW8393	2	PF LOCNUT 0.37
30	HOW8392	2	UNION PIPE FITTING, MALE, 0.37 BULKHEAD
31	13497	1	TUBING COVER-HYDRAULIC STEERING
32	8327	1	HYDRAULIC TUBE ASSEMBLY #4
33	8332	1	HYDRAULIC TUBE ASSEMBLY #3
34	HOW7389	1	ADAPTOR AT PUMP OUTLET-37 DEG MALE, MALE, 50 O-RING (NOT SHOWN)
35	HOW7390	1	UNION AT PUMP INLET-37 DEG, 3/4-16 X 3/4-16, WITH O-RING (NOT SHOWN)
36	HOW7601	1	ELBOW AT LIFT CYLINDER INLET (NOT SHOWN) 37 DEG, WITH O-RINGS, 9/16-18 X SAE 9/16-18

ARTS71 RO
8M12388
11/19/96

Figure 7-1. 2033ES HYDRAULIC SYSTEM LAYOUT

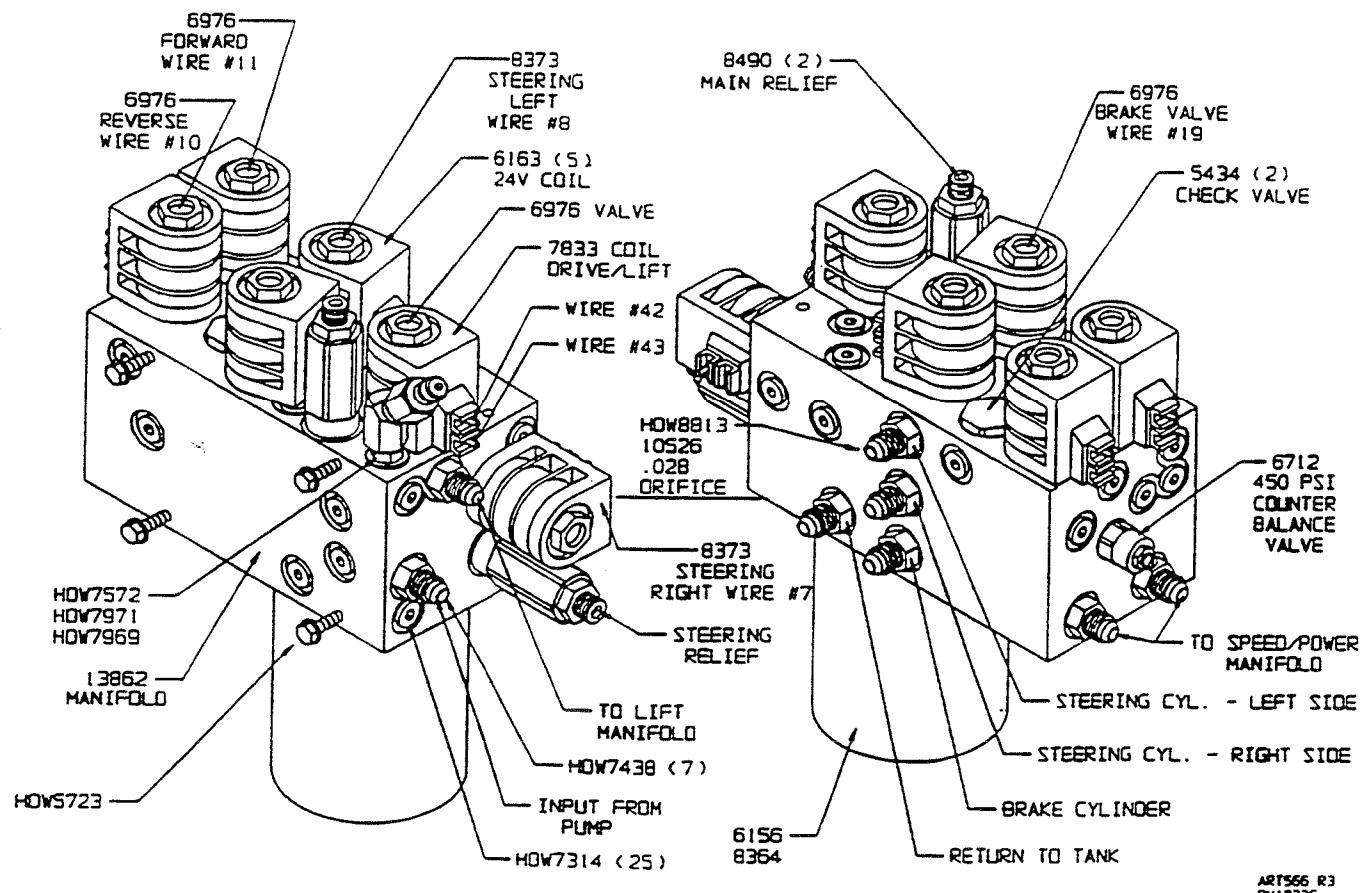


ITEM	PART NO.	QTY.	DESCRIPTION
1	HOW6455	2	BOLT, TITE TAP, 1/4-20, .50 LG.
2	HOW6727	2	FITTING, PIPE, ELBOW, 90 DEG.
3	HOW7500	1	FITTING, PIPE, ELBOW, 90 DEG.
4	13441	1	BRACKET, RESERVOIR MOUNTING
5	8412	1	FILTER, STRAINER - 1"
6	HOW8400	1	FITTING, PIPE, ELBOW, 90 DEG.
7	HOW8549	1	FITTING, PIPE, ADAPTOR
8	HOW5723	1	BOLT, SELFTAP & FORM, HEXHD, 1/4-20, .75 LG.
9	8395	1	RESERVOIR, HYDRAULIC
10	HOW5938	1	FITTING, PIPE, GAUGE
11	8687	1	BREATHER VENT CAP 1/2

ART442 R3
8M9352
3/5/96

Figure 7-2. 2033ES HYDRAULIC RESERVOIR ASSEMBLY

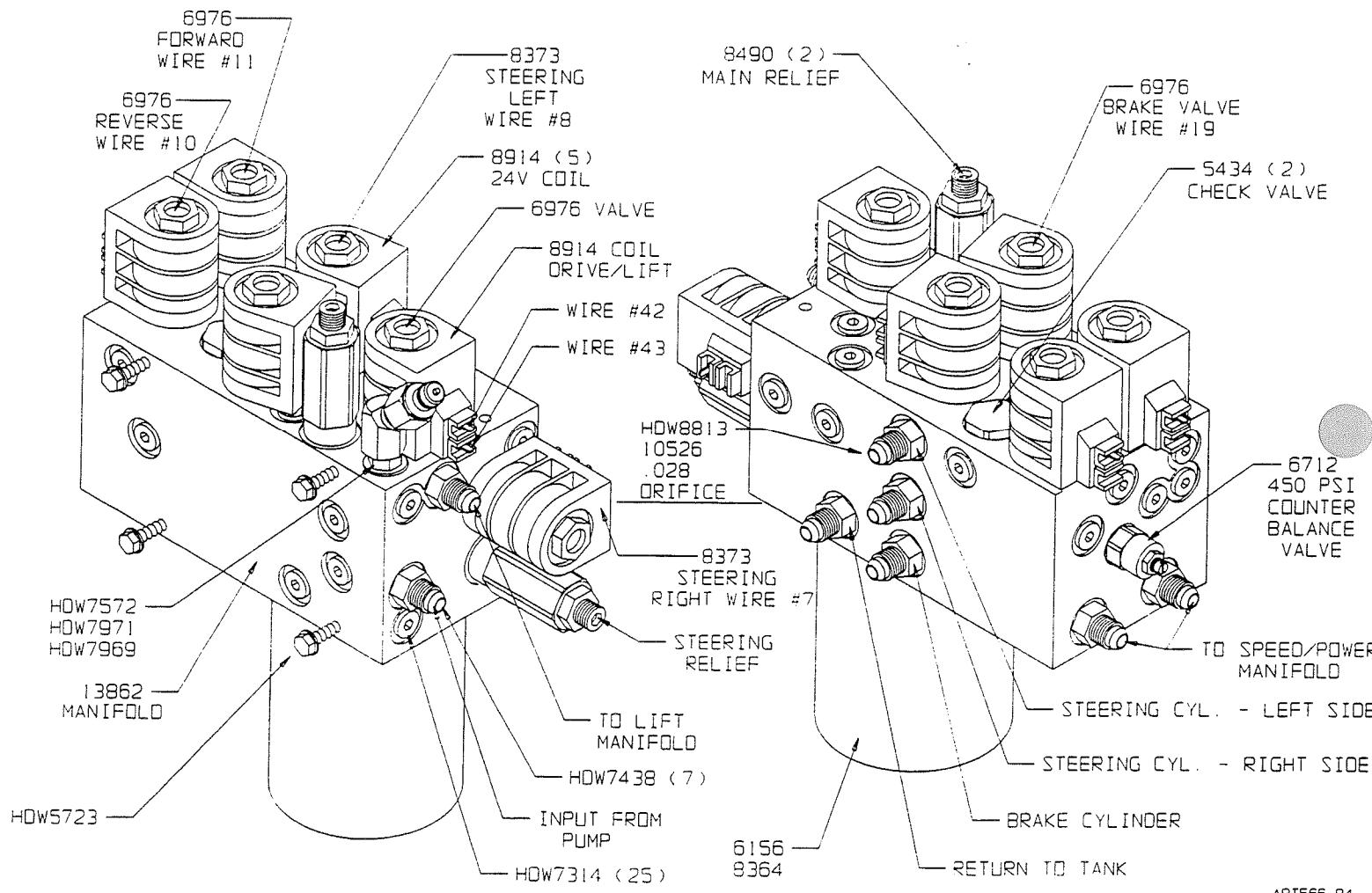
13863 - MAIN MANIFOLD



ART566 R3
BN12335
1/20/97

Figure 7-3. 2033ES Main Hydraulic Manifold

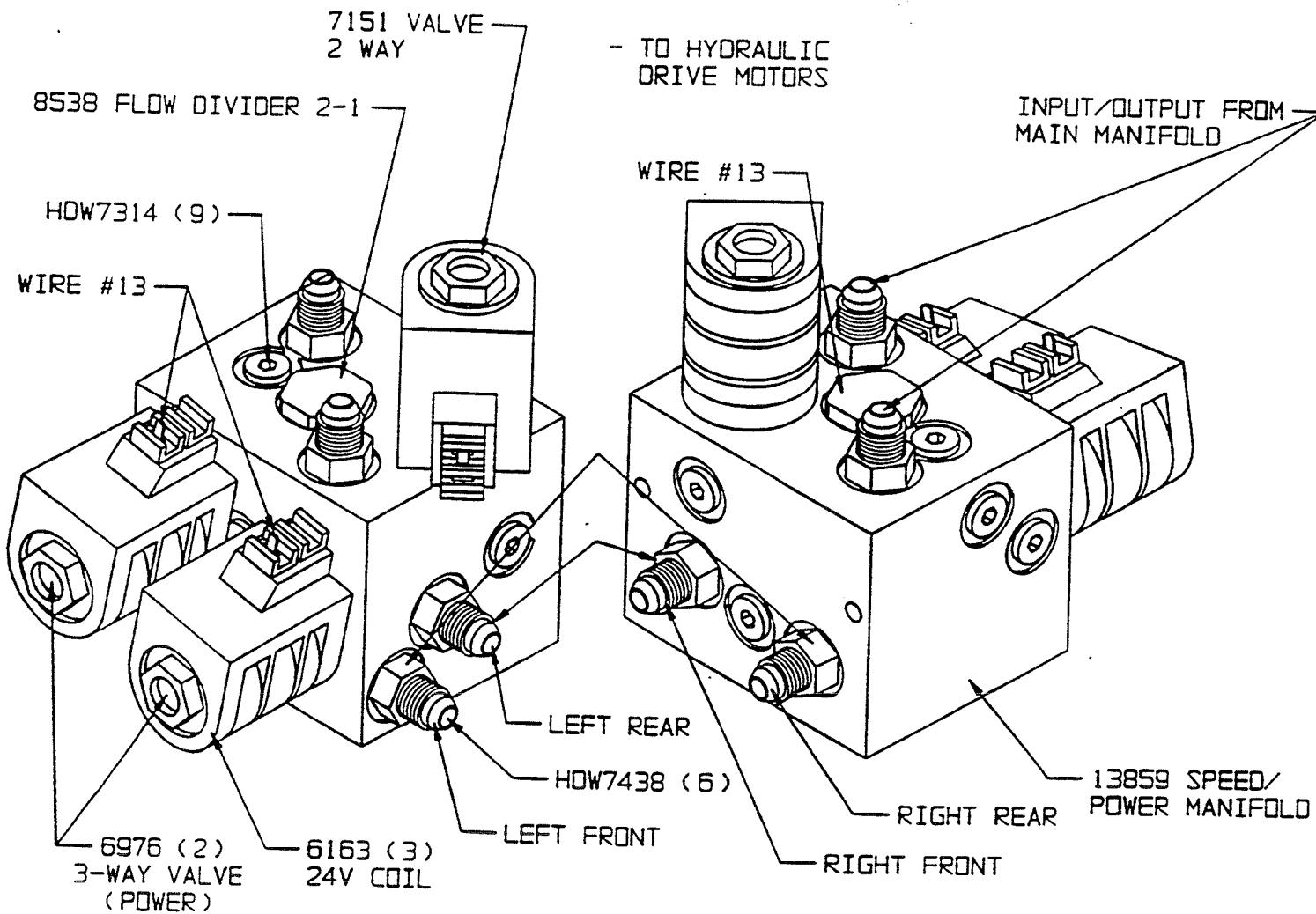
13863 - MAIN MANIFOLD
SERIAL NUMBER 8802624 - PRESENT



ART566 R4
BM12335
5/5/99

Figure 7-3a. 2033ES Main Hydraulic Manifold

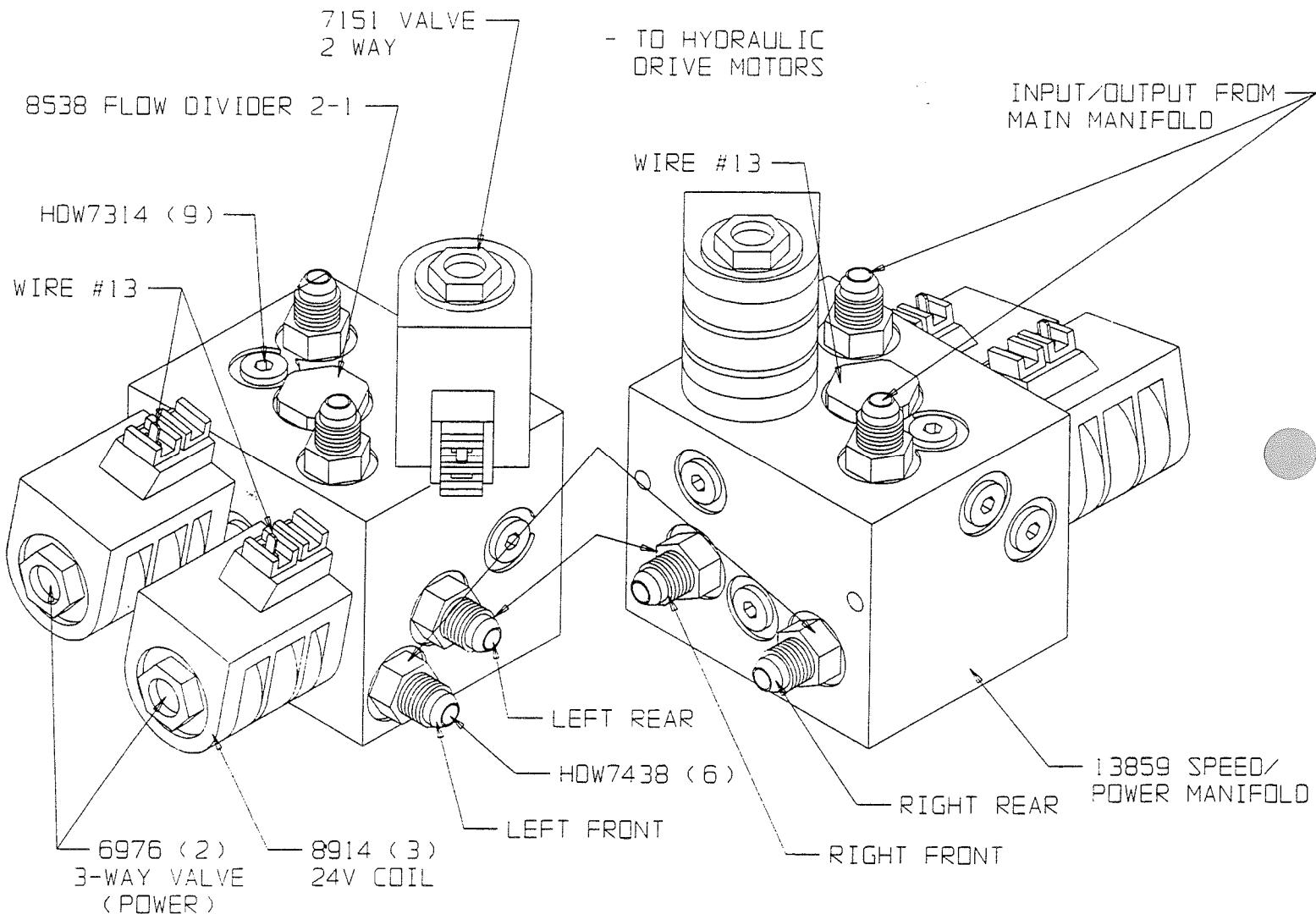
13860 - SPEED/POWER MANIFOLD



ART567 R1
BM12337
5/6/97

Figure 7-4. 2033ES Speed/Power Manifold

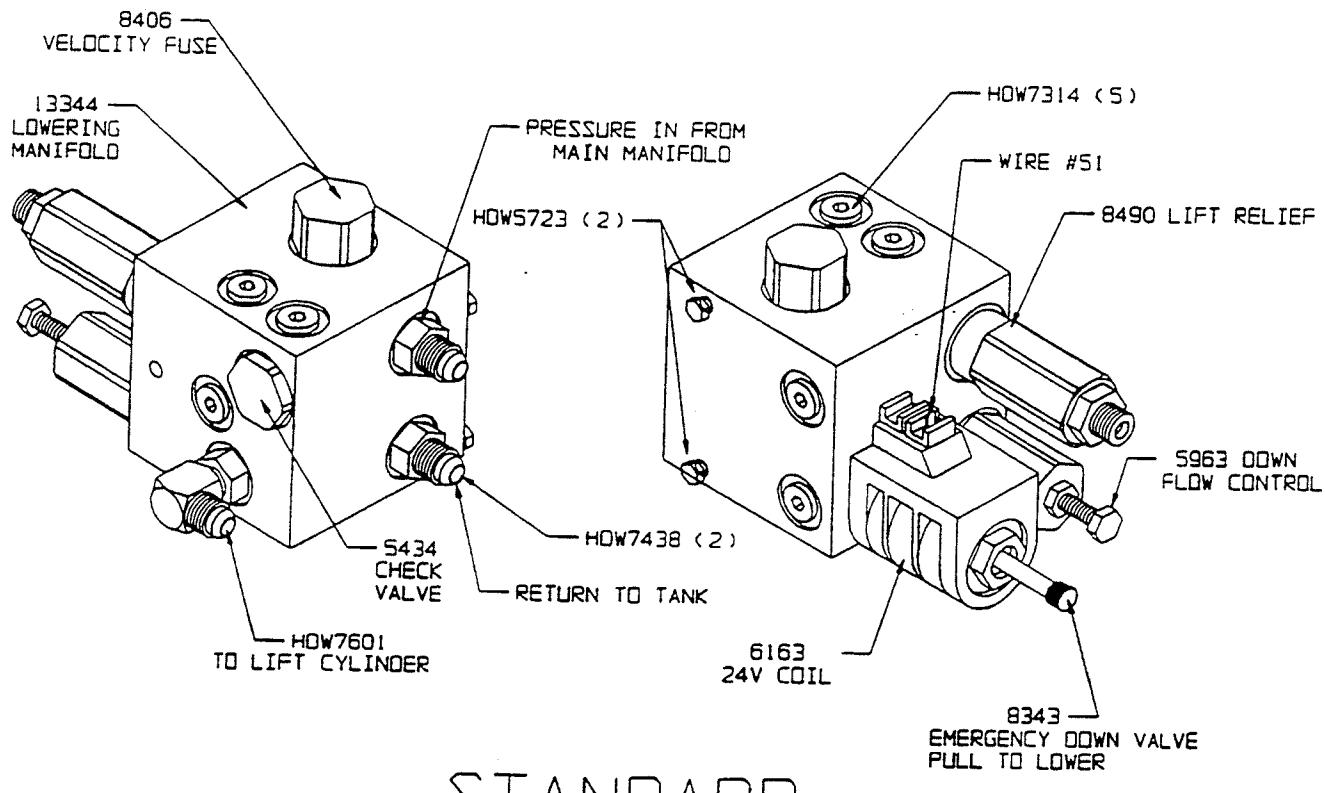
13860 - SPEED/POWER MANIFOLD
SERIAL NUMBER #8802624 - PRESENT



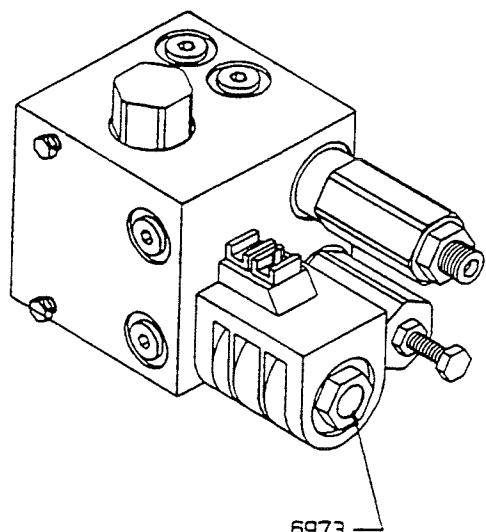
ART567 R2
BM12337
5/5/99

Figure 7-4a. 2033ES Speed/Power Manifold

13347 - LOWERING MANIFOLD



STANDARD



MANIFOLD ASSEMBLY IS IDENTICAL TO 13347
EXCEPT FOR EMERGENCY DOWN VALVE

EUROPEAN

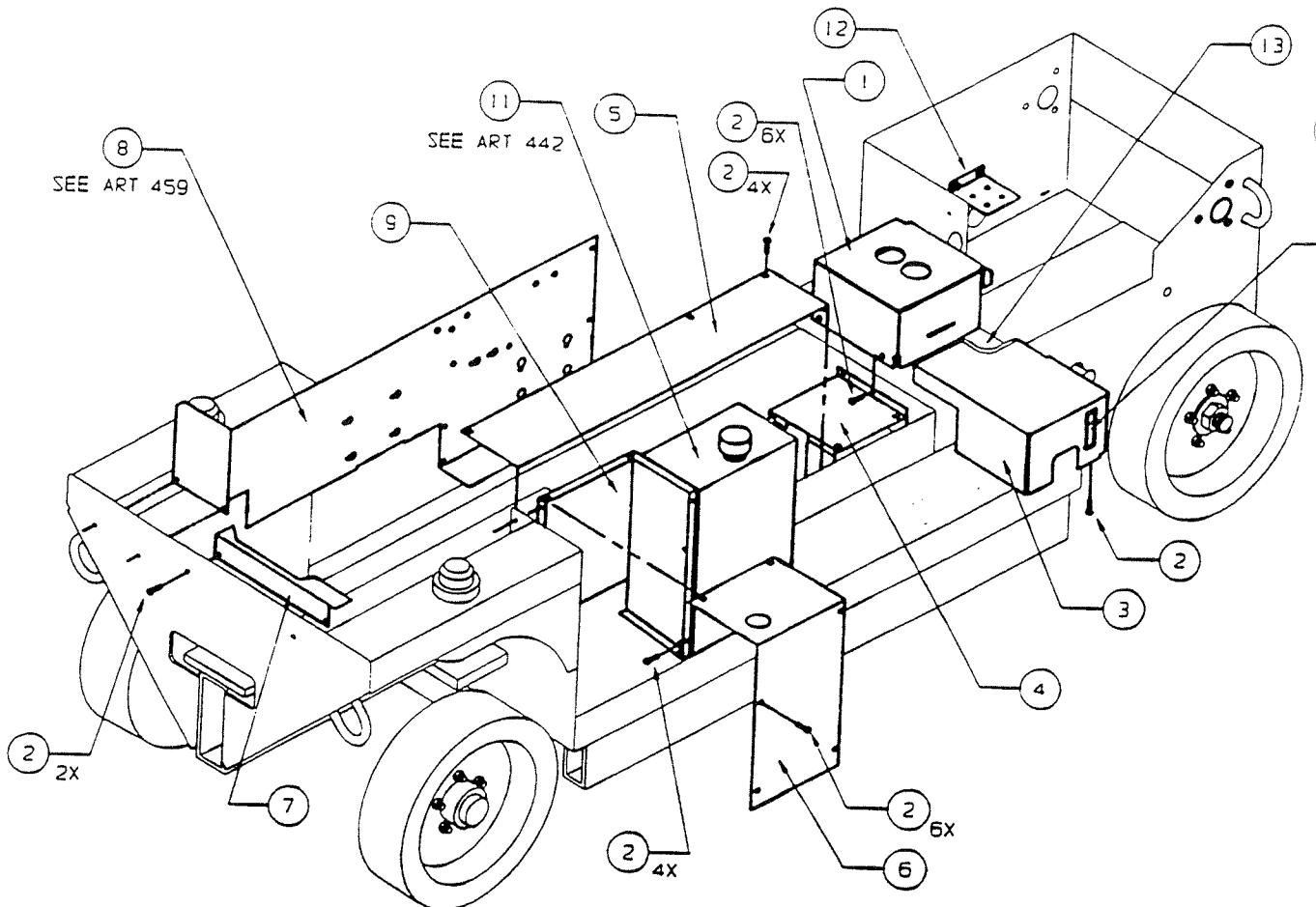
ART 227 85
11/2000

Figure 7-5. 2033ES LOWERING MANIFOLD

NOTES



NOTES

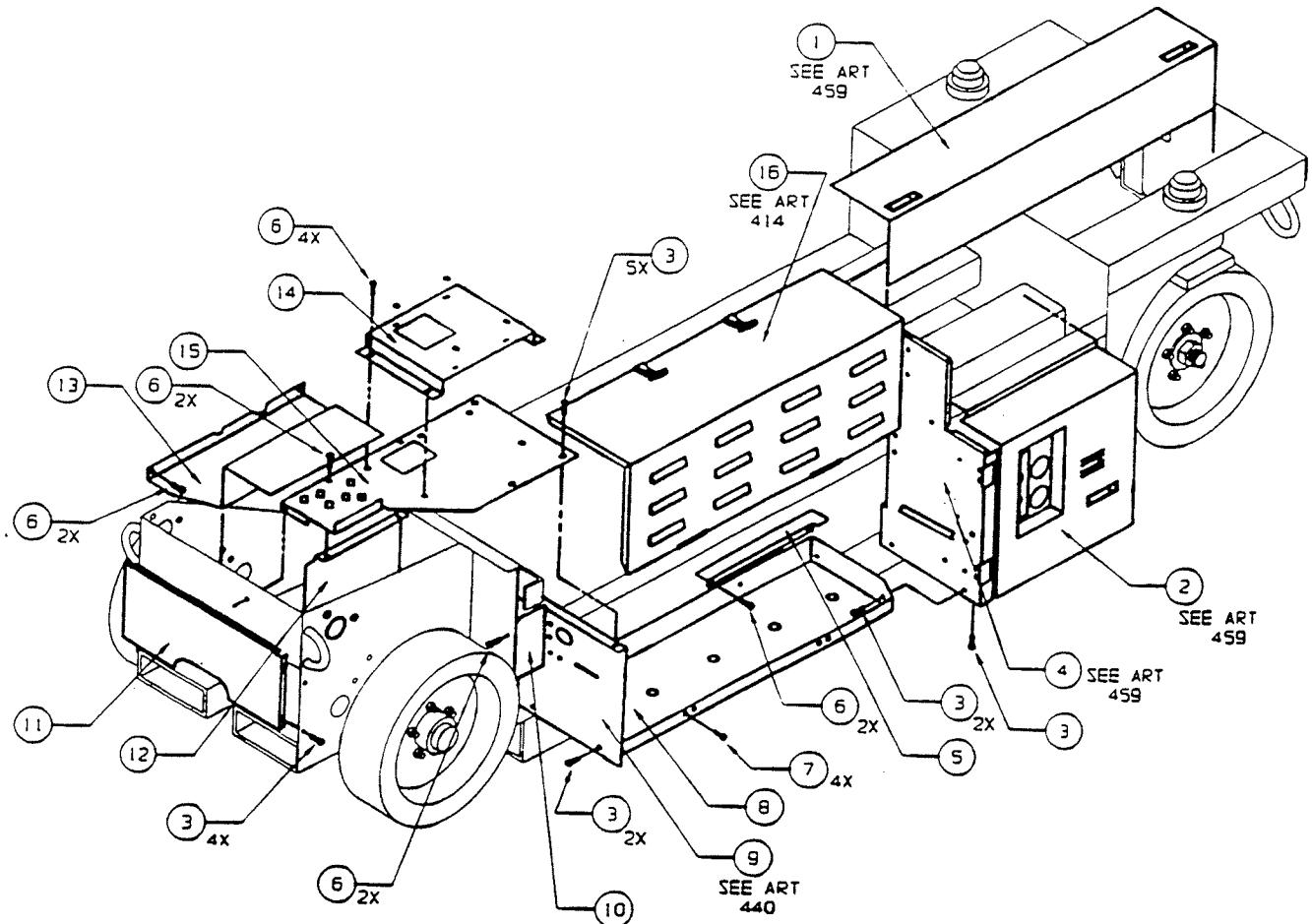


LEFT VIEW

ITEM	PART NO.	QTY.	DESCRIPTION
	13682	1	BASE WELDMENT-2033ES
1	13756	1	COVER, POTHOLE PLUNGER
2	H0W5723	23	BOLT, 1/4-20 X .75, GRADE 5
3	13332	1	COVER, LH POTHOLE LEVER
4	13335	1	COVER, REAR-HOSE/POTHOLE
5	13321	1	COVER, HOSE, LH BASE
6	13320	1	COVER, FRONT, TOP-LH STEERING
7	13497	1	COVER, TUBING HYDRAULIC STEERING
8	13337	1	CABINET WELDMENT-MANIFOLD
9	13319	1	CABINET, REAR/SIDE, LH STEERING
10	8386 9192	1	LATCH, TRIGGER, FLUSH
		1	LATCH, TRIGGER, FLUSH-EURO.
11	8395	1	RESERVOIR, HYDRAULIC FLUID
12	13683	1	BRACKET, MOUNTING, TILT SENSOR
13	6121	2	1/4" TRIM

Figure 8-1. 2033ES BASE COVERS

ART754 RO
BM16988
7/23/98



RIGHT VIEW

ITEM	PART NO.	QTY.	DESCRIPTION
	13682	1	BASE WELDMENT-2033ES
1	13328	1	COVER WELDMENT, MANIFOLD & MOTOR
2	13858	1	SWITCH PANEL
3	HOW5724	14	BOLT, 5/16-18 X .75, GRADE 5
4	13364	1	LH MOTOR CABINET WELDMENT, SIDE
5	13329	1	COVER, RH HOSE
6	HOW5723	12	BOLT, 1/4-20 X .75, GRADE 5
7	HOW6455	4	BOLT, 1/4-20 X .50, GRADE 5
8	13352	1	BOX, BATTERY, BOTTOM
9	13360	1	LH SIDE-BATTERY BOX WELDMENT
10	13330	1	COVER, RH POTHOLE LEVER
11	13934	1	COVER, REAR BRAKE
12	13312	1	COVER, SUPPORT BRACKET, BRAKE CYLINDER
13	13684	1	BRACKET, BRAKE COVER
14	13316	1	BRACKET, MOUNTING CHARGER
15	13315	1	PLATE, BATTERY CHARGER, MOUNTING, BASE
16	13355	1	BATTERY COVER WELDMENT

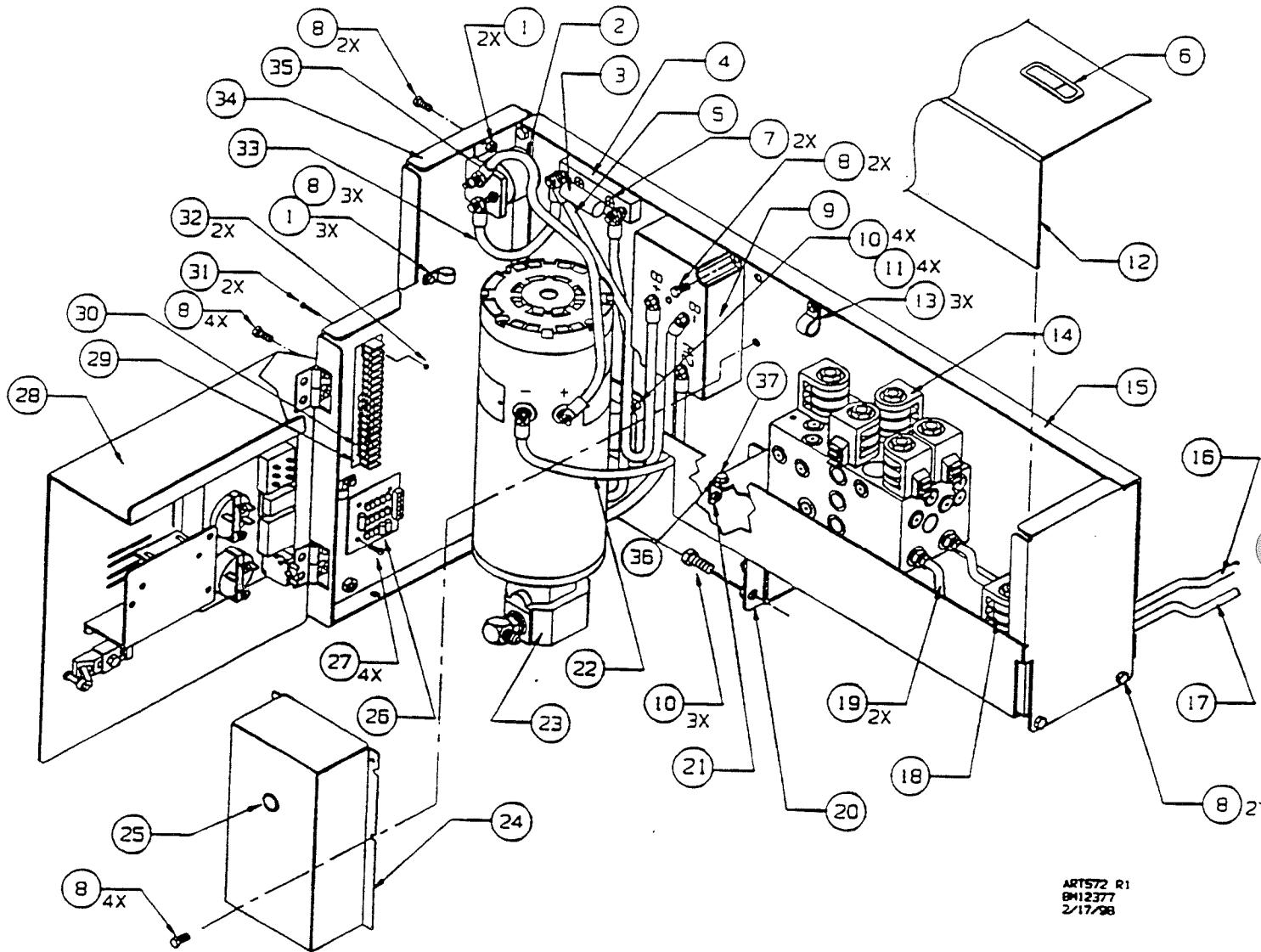


Figure 8-2. 2033ES Motor Cabinet

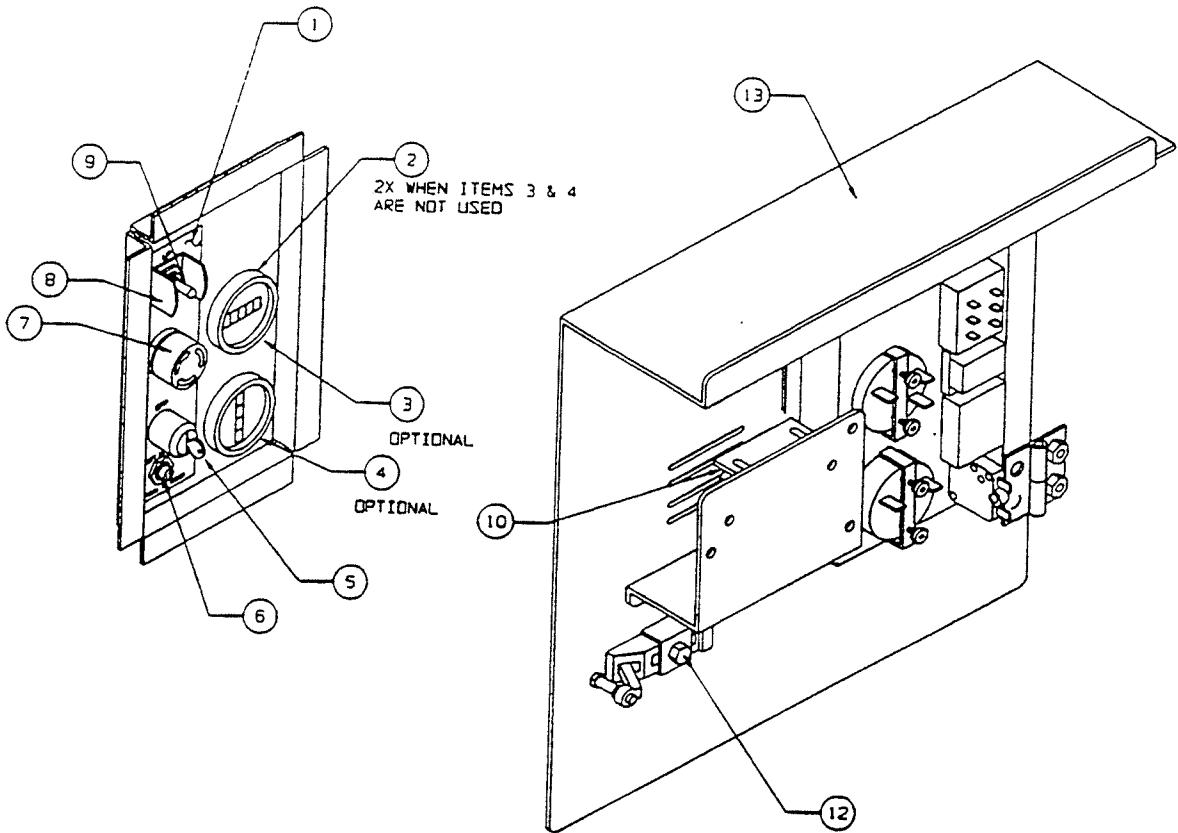
ITEM	PART NO.	QTY.	DESCRIPTION
1	HOW8267	5	LOC NUT, 1/4"-20
2	8425	1	BATTERY CABLE, UL1283, #2-RED, 13.5"
3	8344	1	FUSE, 200A
4	8345	1	FUSE HOLDER, 140-200A
5	8585	1	BATTERY CABLE, UL1283, #6-RED, 23.0"
6	8386 9192	2	TRIGGER LATCH, FLUSH TRIGGER LATCH, FLUSH-EURO
7	HOW7778	2	SCREW, COUNTERSINK, 1/4"-20 X 1.25"
8	HOW5723	17	SCREW, 1/4"-20 X .75"
9	8539	1	CONTROLLER, DC, 250 AMP
10	HOW5724	11	SCREW, 5/16"-18 X .75"
11	HOW7032	4	NUT, 5/16"-18B, CLASS 2
12	13328	1	MOTOR COVER WELDMENT & MANIFOLD CABINET
13	5882	3	CABLE CLAMP
14	13345	1	MANIFOLD ASSEMBLY
15	13337	1	MANIFOLD CABINET WELDMENT
16	8327	1	HYDRAULIC TUBE ASSEMBLY, #4
17	8332	1	HYDRAULIC TUBE ASSEMBLY, #3
18	13860	1	MANIFOLD ASSEMBLY
19	8333	2	HYDRAULIC TUBE ASSEMBLY #1
20	13365	1	SUPPORT BRACKET, LONG MANIFOLD CABINET
21	13366	1	SUPPORT BRACKET, SHORT MANIFOLD CABINET
22	8427	1	BATTERY CABLE, UL1283, #2-BLACK, 22.3"
23	13437	1	PUMP-MOTOR ASSEMBLY
24	13536	1	MOTOR CONTROL COVER
25	8588	1	WINDOW PLUG, .75" DIA.
26	8601	1	CIRCUIT BOARD, MOTOR CONTROL
27	HOW5229	4	SCREW, #6-32 X .37
28	13858	1	DOOR WELDMENT, MOTOR CABINET
29	7817	1	ID CARD
30	5991	1	TERMINAL STRIP
31	HOW5363	2	SCREW, 6-32 X 1.00
32	HOW5364	2	NUT, 6-32, GRADE 5
33	8426	1	BATTERY CABLE, UL1238, #2-RED, 9.0"
34	13364	1	LEFT HAND MOTOR CABINET WELDMENT
35	5967	1	CONTACTOR, 24 VDC
36	HOW8294	1	WASHER, .312 ID X 1.000 OD X .100 THK.
37	HOW5204	1	SCREW, 5/16"-18 X 1.00"

ART572 R1
BM12377
2/17/98

Figure 8-2. 2033ES Motor Cabinet

NOTES

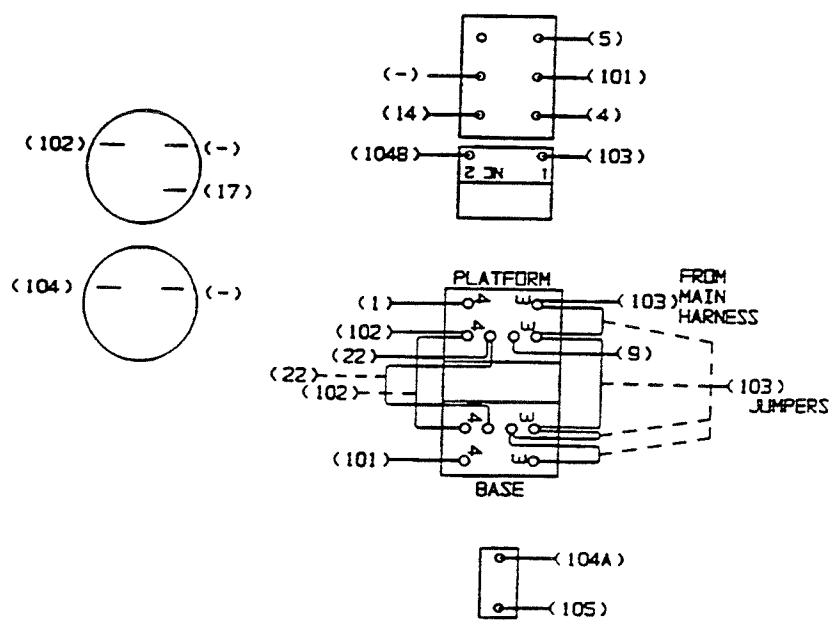
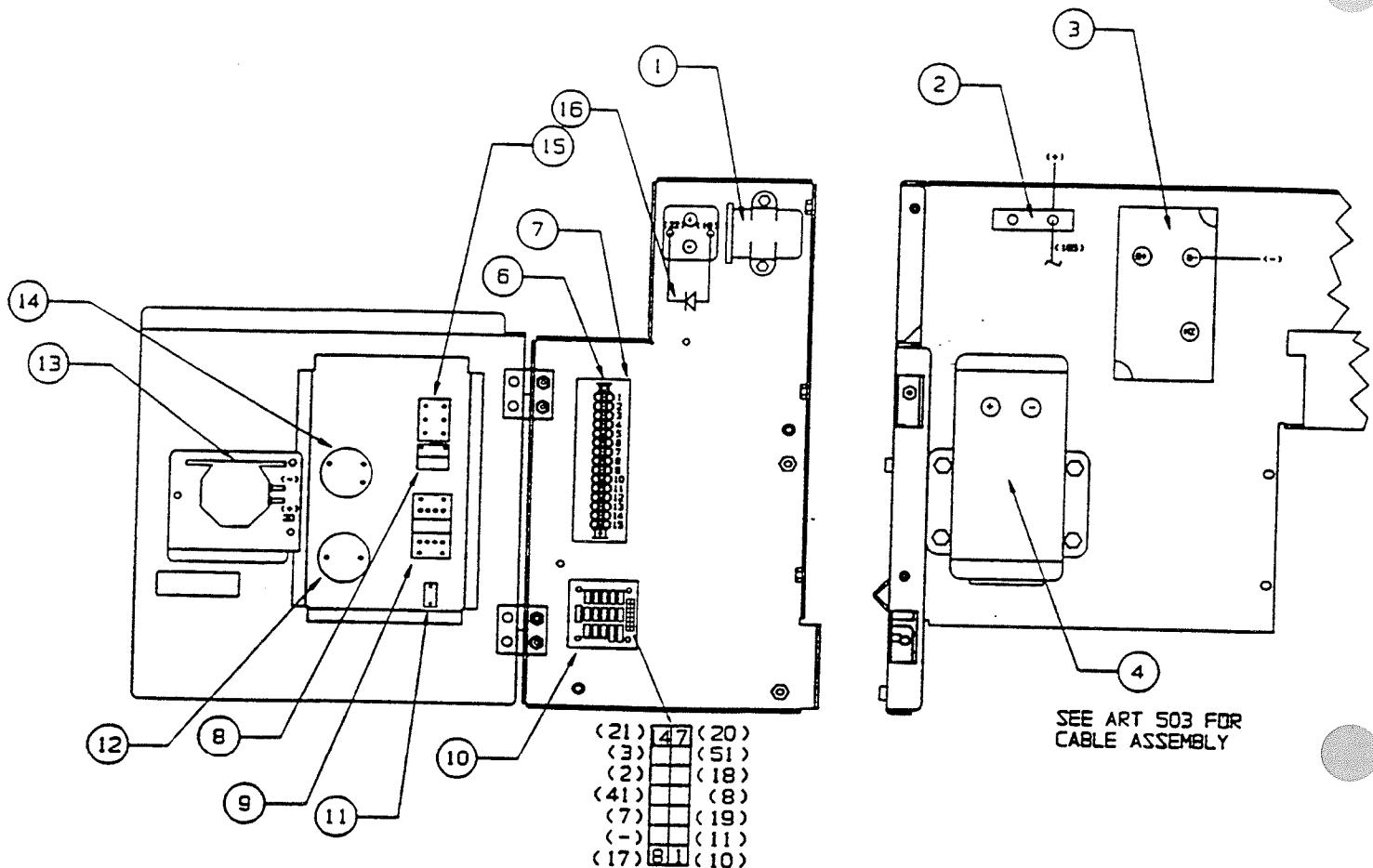




ITEM	PART NO.	QTY.	DESCRIPTION
1	8788	1	DECAL-CONTROL BASE
2	7115	0-2	PLUG, PRY OUT HOLE
3	7909	1	METER-HOUR, 24-48 VOLT DC
4	7099	1	BATTERY, FUEL GAGE, 24 VOLT
5	8787	1	KEY, SWITCH
6	7235	1	CIRCUIT BREAKER, 15 AMP MANUAL
7	7800	1	SWITCH, STOP ASSEMBLY
8	1313	1	GUARD, SWITCH
9	5964	1	SWITCH, TOGGLE, 3 POSITION
10	8698	1	MOTION ALARM (12-48 VOLTS)
11			
12	8386 9192	1	LATCH, TRIGGER, FLUSH LATCH, TRIGGER, FLUSH-EURO
13	13858	1	DOOR WELDMENT, MOTOR CABINET

ART569 R1
BM12340
2/17/98

Figure 8-3. 2033ES Motor Cabinet, Door



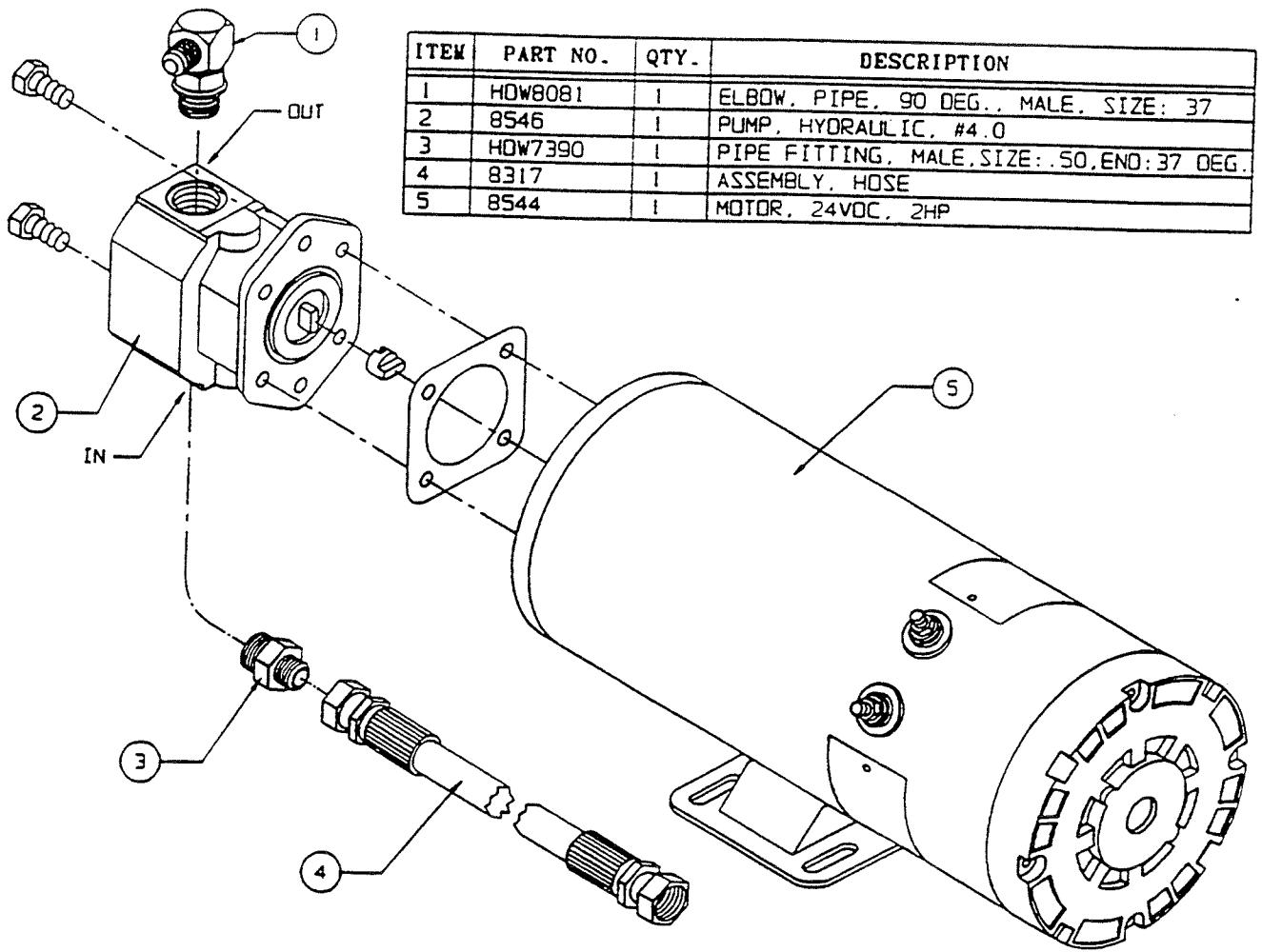
ART503 R1
SH12230
6/10/87

Figure 8-4. 2033ES Electrical Schematic, Door

ITEM	PART NO.	QTY.	DESCRIPTION
1	5967	1	CONTACTOR, 24 VDC
2	8344	1	FUSE, 200A
3	8539	1	MOTOR, SPEED CONTROLLER
4	8544	1	MOTOR, 24VDC, 2 HP
5			
6	5991	1	BLOCK, TERMINAL
7	7817	1	STRIP, BACKING-15 POSITION
8	7800	1	SWITCH STOP ASSEMBLY
9	8787	1	SWITCH, KEY
10	8601	1	BOARD, CIRCUIT-MOTOR CONTROL
11	7235	1	CIRCUIT BREAKER, 15 AMP, MANUAL
12	7099	1	BATTERY, FUEL GAGE
13	8698	1	MOTION ALARM (12-48 VOLTS)
14	7909	1	METER, HOUR, 24-48 VOLT DC
15	5694	1	SWITCH, TOGGLE, 3 POSITION
16	8368	1	DIODE ASSEMBLY, FAST ACTING

ART568 R1
BM12339
6/10/97

Figure 8-4. 2033ES Electrical Schematic, Door

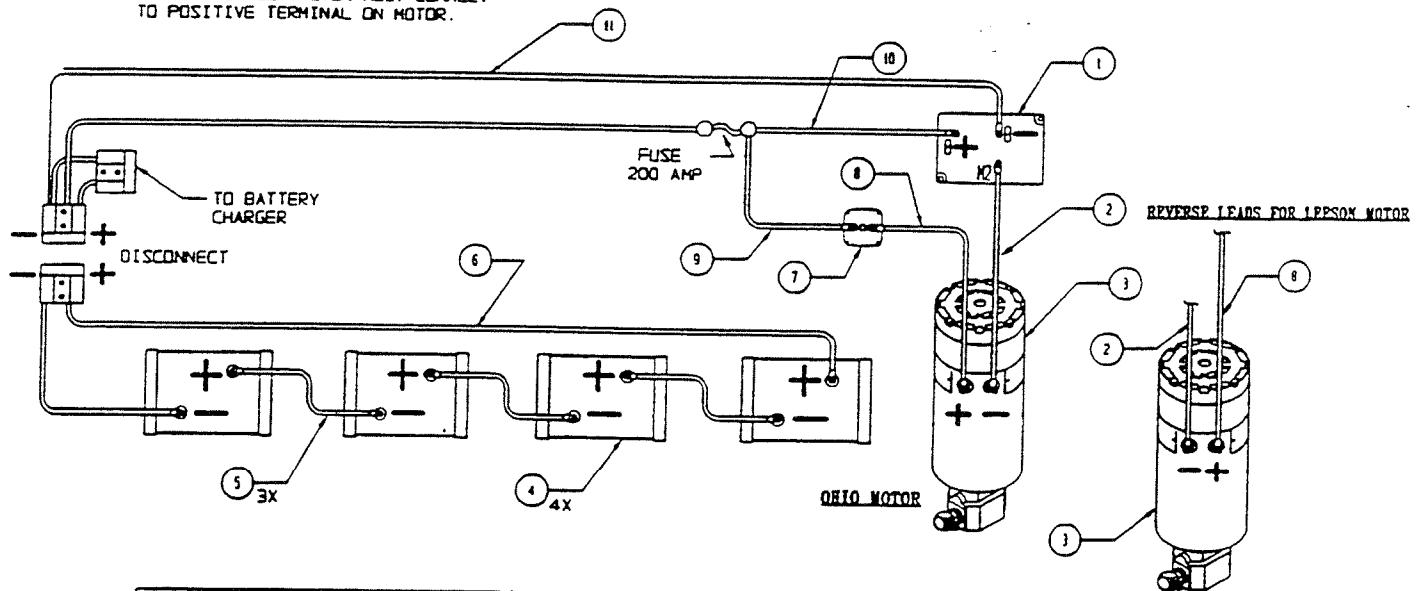


ART380 RS
8M5396
12/22/95

Figure 8-5. 2033ES Pump/Motor Assembly

NOTES: (UNLESS OTHERWISE SPECIFIED)

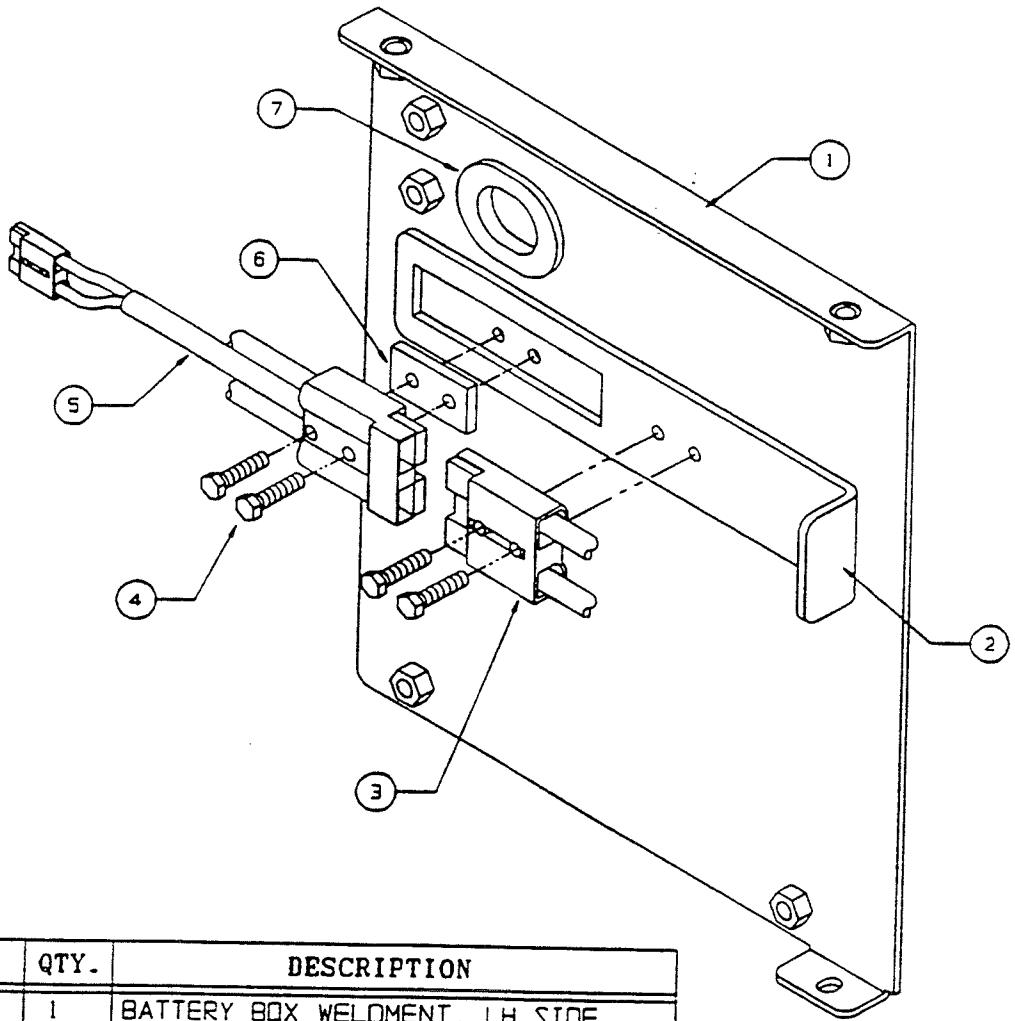
1. CABLE FROM CONTACTOR MUST CONNECT TO POSITIVE TERMINAL ON MOTOR.



ITEM	PART NO.	QTY.	DESCRIPTION
1	8539	1	CONTROLLER, 250 AMP, DC
2	8427	1	CABLE, BATTERY-UL1283-#2 BLK, 22.3"
3	8544	1	MOTOR, 24 VOC, 2HP
4	5970	4	BATTERY, 6V
5	6208	3	JUMPER, BATTERY
6	8397	1	CONNECTOR/CABLE BATTERY
7	5967	1	CONTACTOR-24 VOC
8	8425	1	CABLE, BATTERY-UL1238-#2 RED, 13.5"
9	8426	1	CABLE, BATTERY-UL1283-#2 RED, 9.0"
10	8585	1	CABLE, BATTERY-UL1283-#6 RED, 23.0"
11	8396	1	CONNECTOR/CABLE ASSY-BATTERY

ART503 R1
BM10963
7/9/96

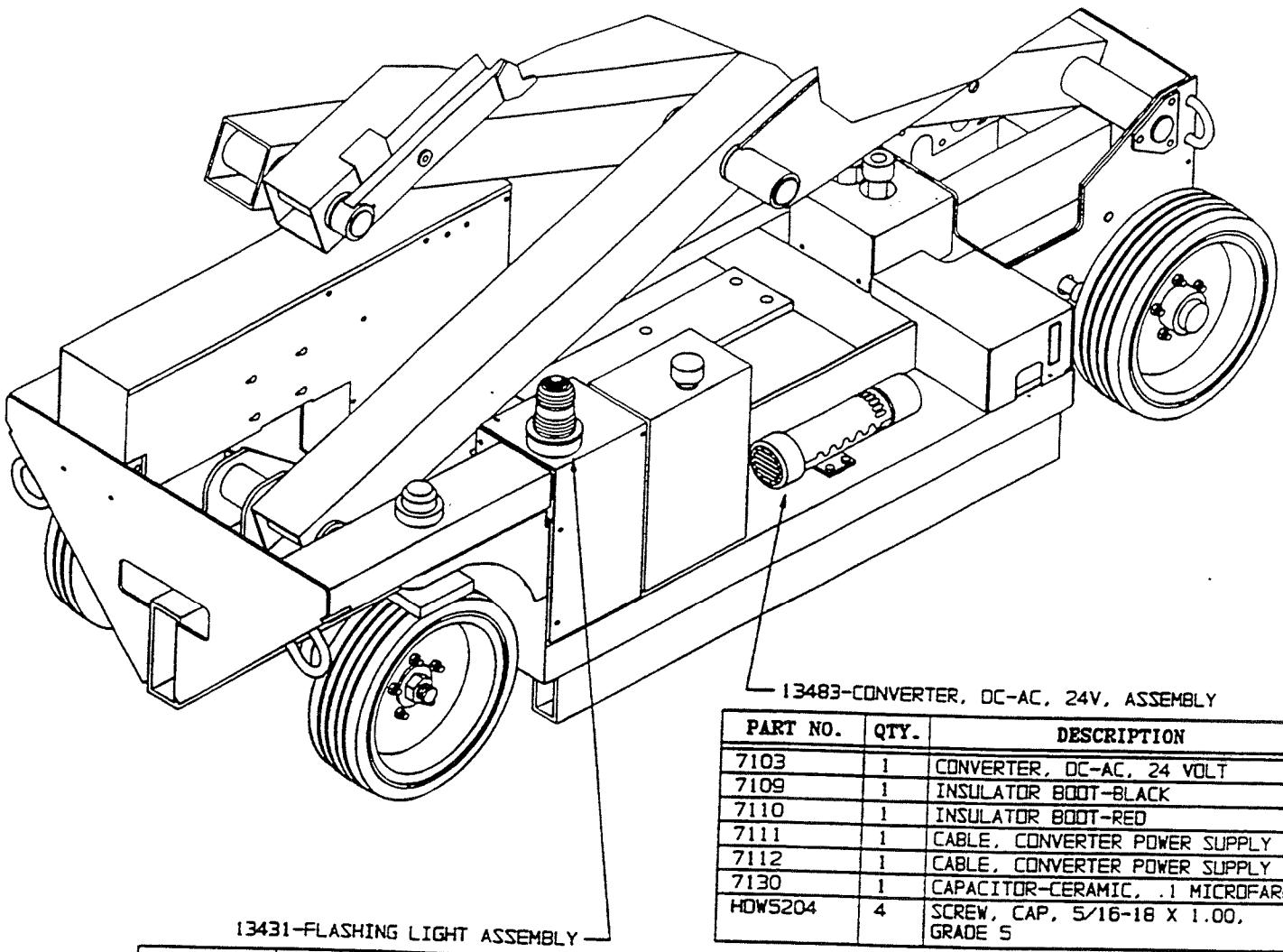
Figure 8-6. 2033ES BATTERY AND MOTOR CABLES



ITEM	PART NO.	QTY.	DESCRIPTION
1	13360	1	BATTERY BOX WELIMENT, LH SIDE
2	13359	1	BRACKET, SLIDE-DISCONNECT
3	8397	1	CONNECTOR/CABLE- BATTERY
4	HDW6029	4	BOLT, SELF TAP & FORM, SLOT DRIVE 1/4-20 X 1.50, GRADE 5
5	8396	1	CONNECTOR/CABLE ASSY-BATTERY
6	4591	1	BRACKET, MOUNTING, DISCONNECT
7	5863	1	GROMMET, .187 X 1.5 X 1.75

ART440 R1
BM9303
2/12/96

Figure 8-7. 2033ES BATTERY DISCONNECT ASSEMBLY



13431-FLASHING LIGHT ASSEMBLY

13483-CONVERTER, DC-AC, 24V, ASSEMBLY

PART NO.	QTY.	DESCRIPTION
7103	1	CONVERTER, DC-AC, 24 VOLT
7109	1	INSULATOR BOOT-BLACK
7110	1	INSULATOR BOOT-RED
7111	1	CABLE, CONVERTER POWER SUPPLY
7112	1	CABLE, CONVERTER POWER SUPPLY
7130	1	CAPACITOR-CERAMIC, .1 MICROFARE
H0W5204	4	SCREW, CAP, 5/16-18 X 1.00, GRADE 5

PART NO.	QTY.	DESCRIPTION
6011	1	CLAMP, CABLE
7476	2	TERMINAL PIN, AMP CONNECTOR
7595	1	LIGHT, SIGNAL
7640	1	CONNECTOR, AMP 2 PIN
8933	1	BULB, XENON STROBE #5001

ART531 R1
BM11230
6/10/97

Figure 8-8. 2033ES Warning Light and Converter

ITEM	PART NO.	QTY.	DESCRIPTION
1	HDW8270	4	NUT, 1/2"-13
2	HDW8283	4	SCREW, 1/2"-13, 1 1/2" LONG
3	13816	1	ACCESS LADDER

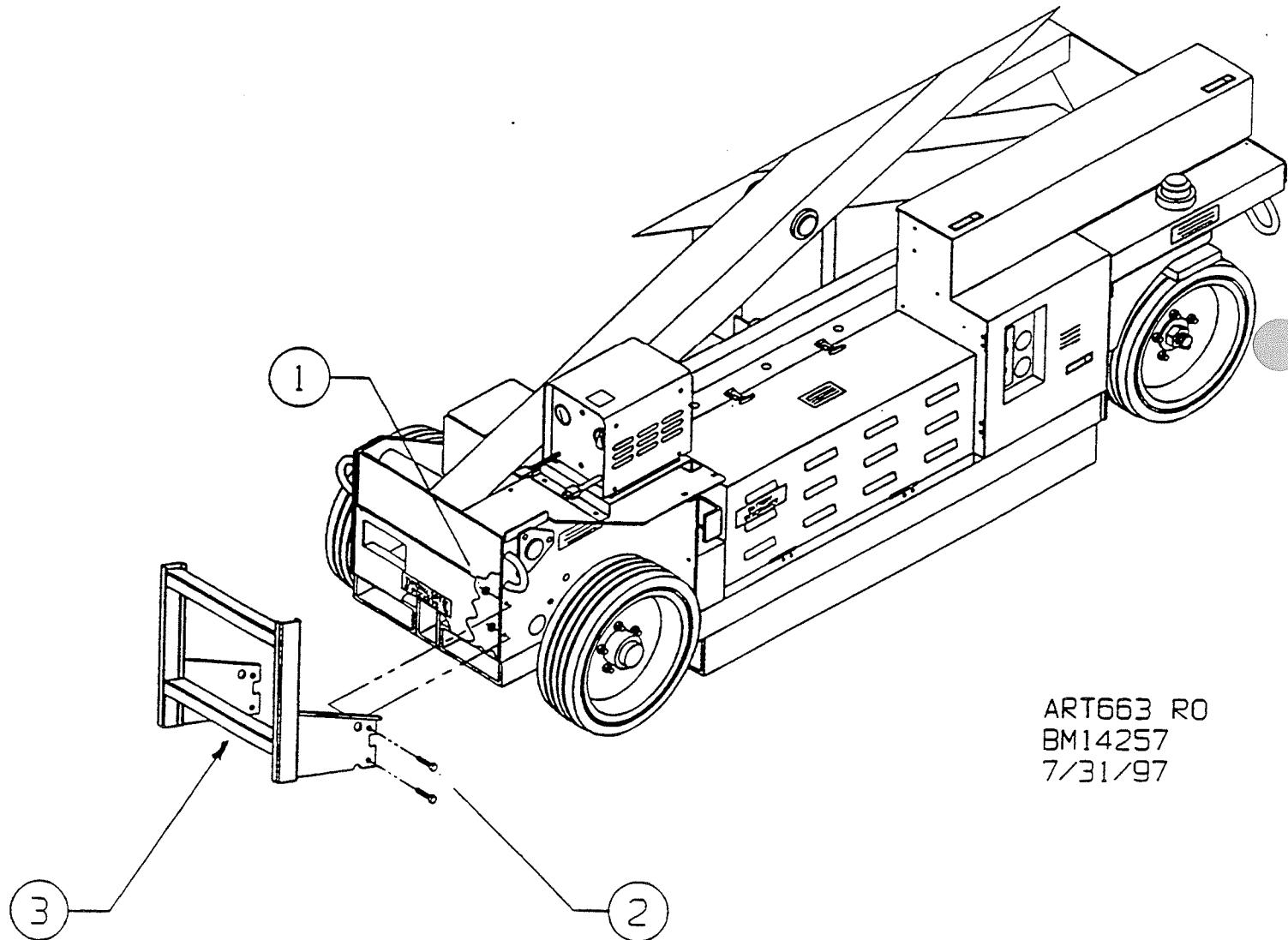


Figure 8-9. 2033ES Access Ladder Assembly

ITEM	PART NO.	QTY.	DESCRIPTION
1	HOW6433	1	SCREW, FLANGE HEAD, 3/8"-16 X 1" LONG
2	HOW8741	1	LOCK WASHER, 3/8" ID
3	7638	1	GROUNDING STRAP, 1" WIDE, 24" LONG
4	HOW5355	1	FLAT WASHER, 7/16" ID, 1" OD
5	HOW5039	1	NUT, 3/8"-16

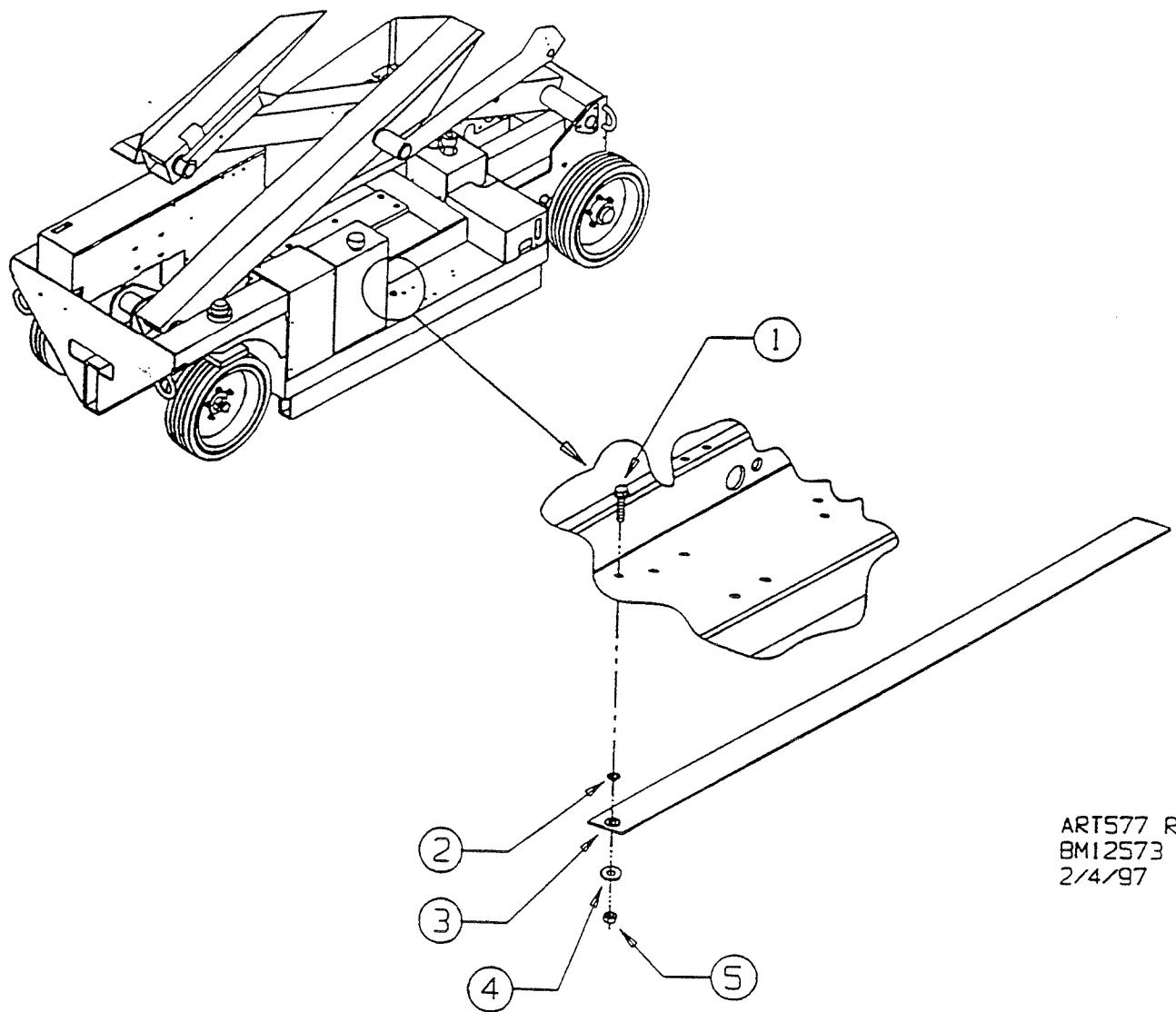
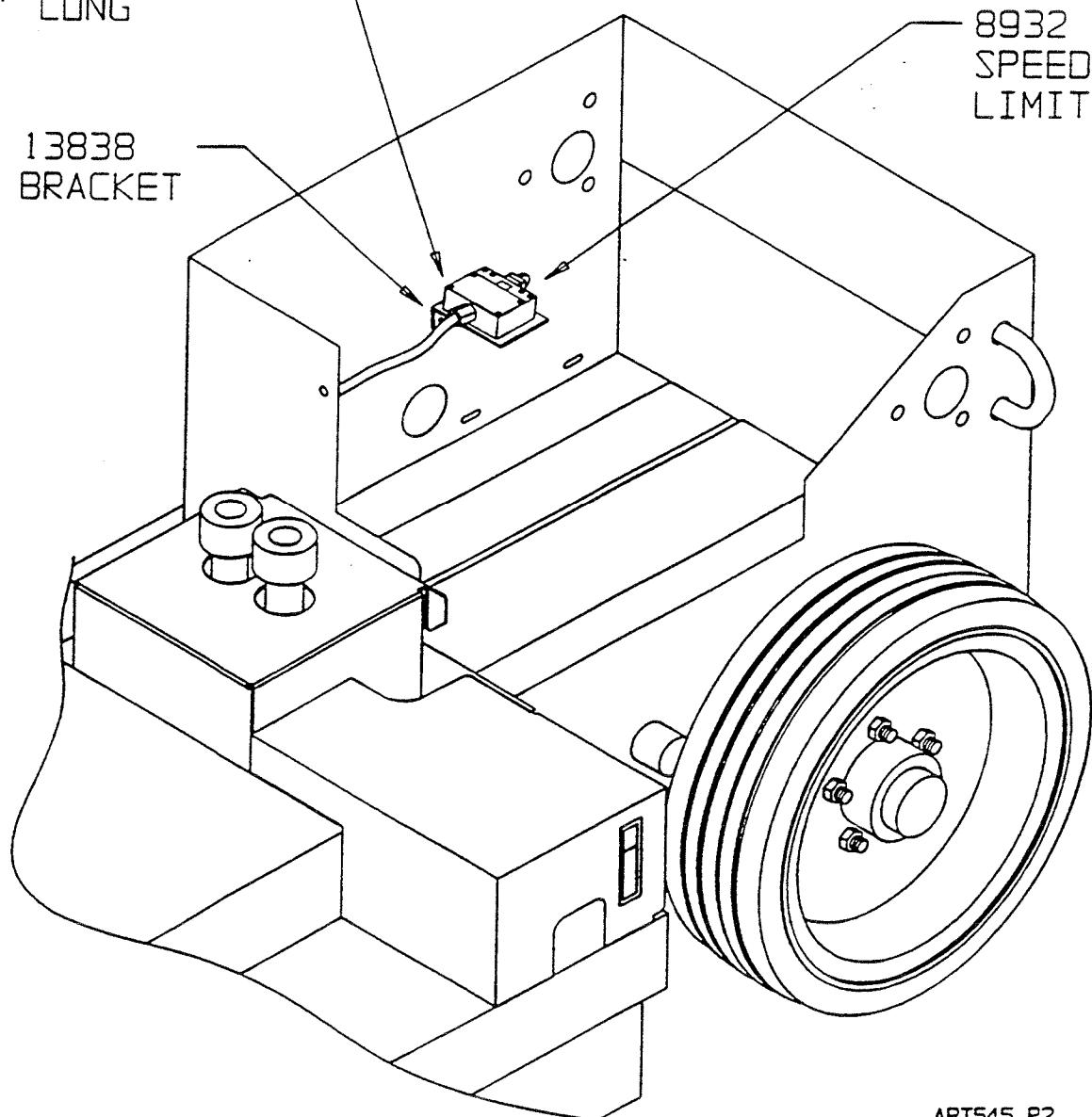


Figure 8-10. 2033ES Static Strap Assembly

HOW5723 (2X)
SCREWS, 1/4"-20
3/4" LONG

13838
BRACKET

8932
SPEED & POTHOLE
LIMIT SWITCH



ART545 R2
8M11967
5/17/97

Figure 8-11. 2033ES Pothole and Speed Limit Switch

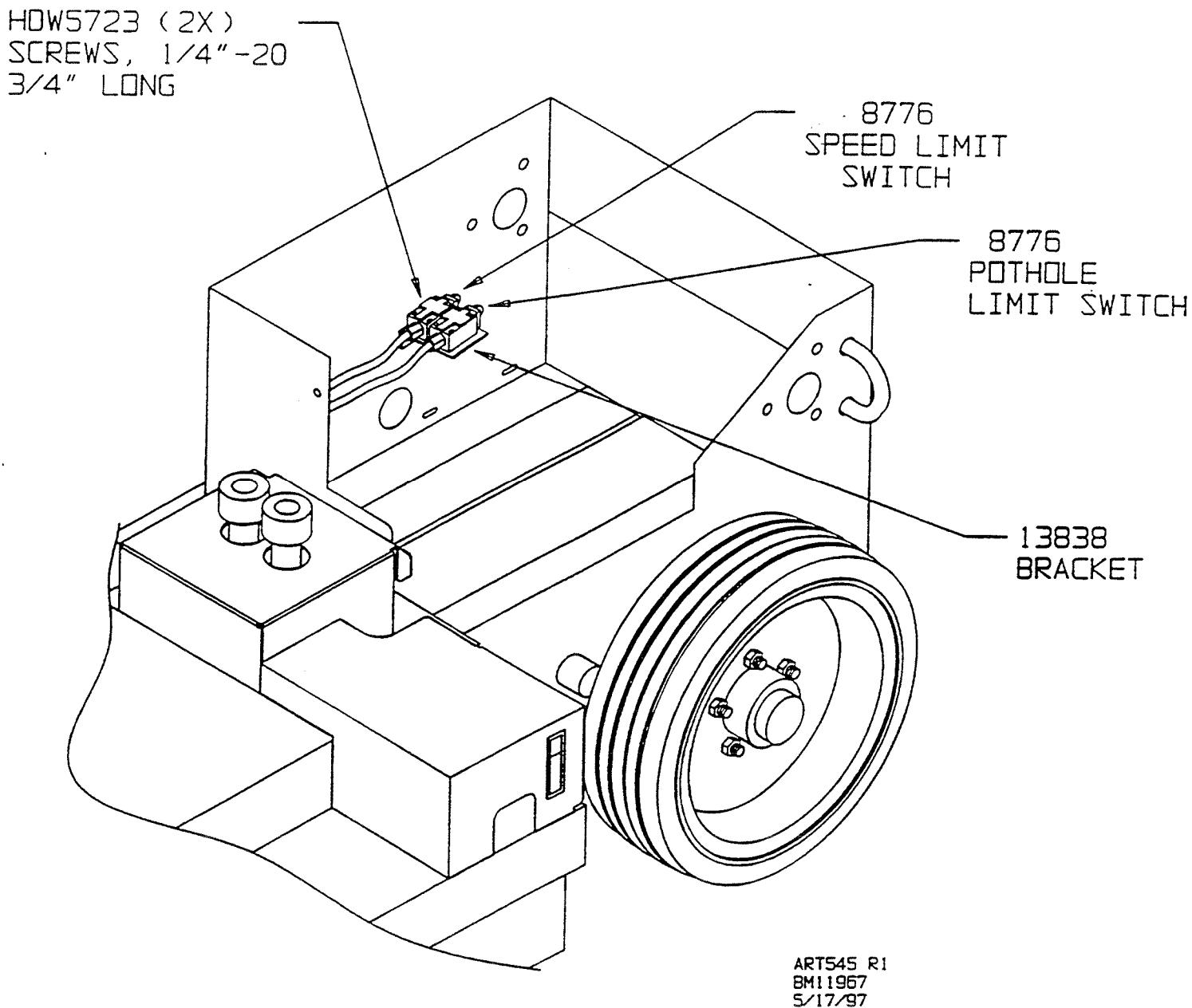
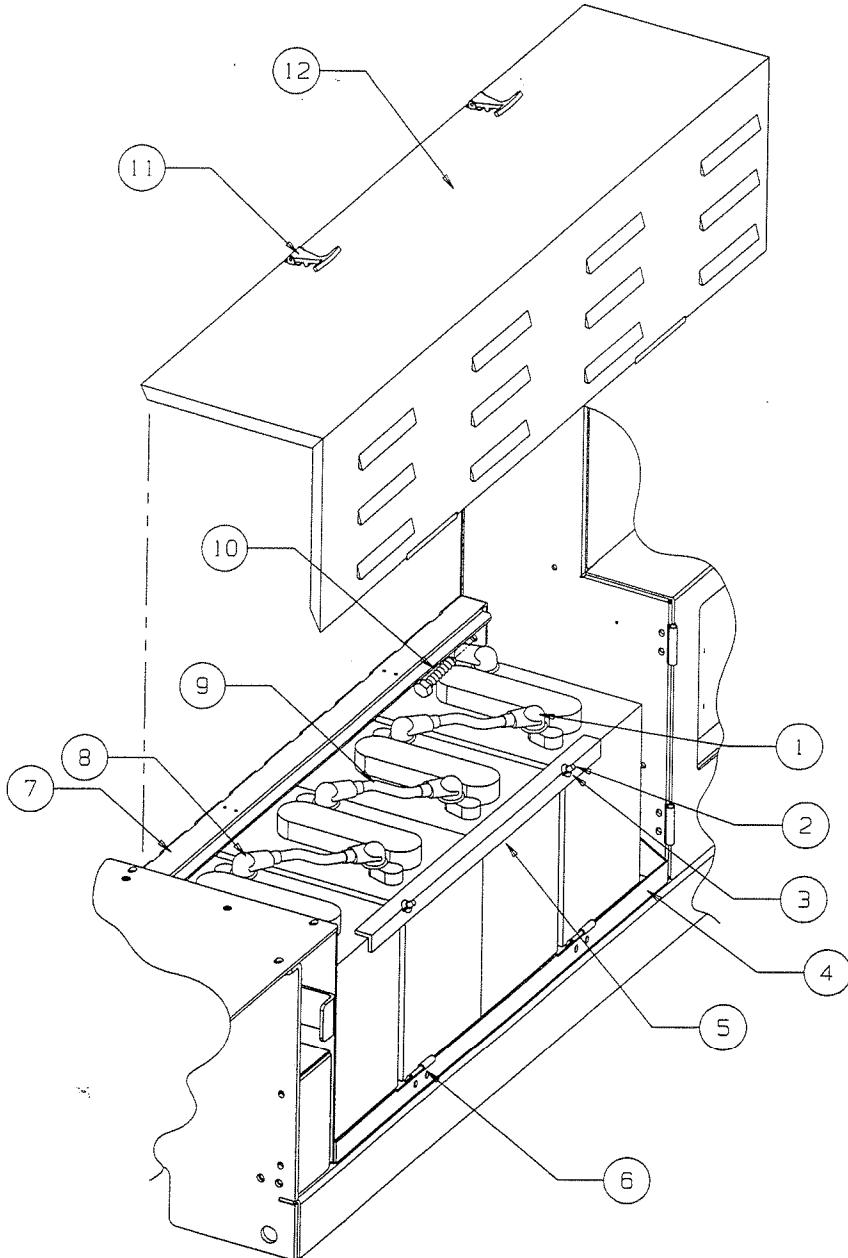


Figure 8-11a. 2033ES Pothole and Speed Limit Switches



ITEM	PART NO.	QTY.	DESCRIPTION
1	7172	4	BOOT, (BLACK), TERMINAL INSULATOR
2	13263	2	ROD, HOLD DOWN
3	HDW6110	2	NUT, WING, TYPE A, 1/4-20, CLASS 20
4	13352	1	BOX, BATTERY, BOTTOM
5	13773	1	HOLD DOWN, BATTERY
6	13354	2	HINGE, SLIP, MALE HALF, L.H.
7	13351	1	SUPPORT, COVER-BATTERY BOX
8	7173	4	BOOT (RED) TERMINAL INSULATOR
9	6208	3	JUMPER, BATTERY
10	HDW5724	4	BOLT, 5/16-18 X .75, GRADE 5
11	7966	2	LATCH, DRAW-RUBBER
12	13355	1	BATTERY COVER WELDMENT
	8355	2	HINGE, FEMALE

NOTES



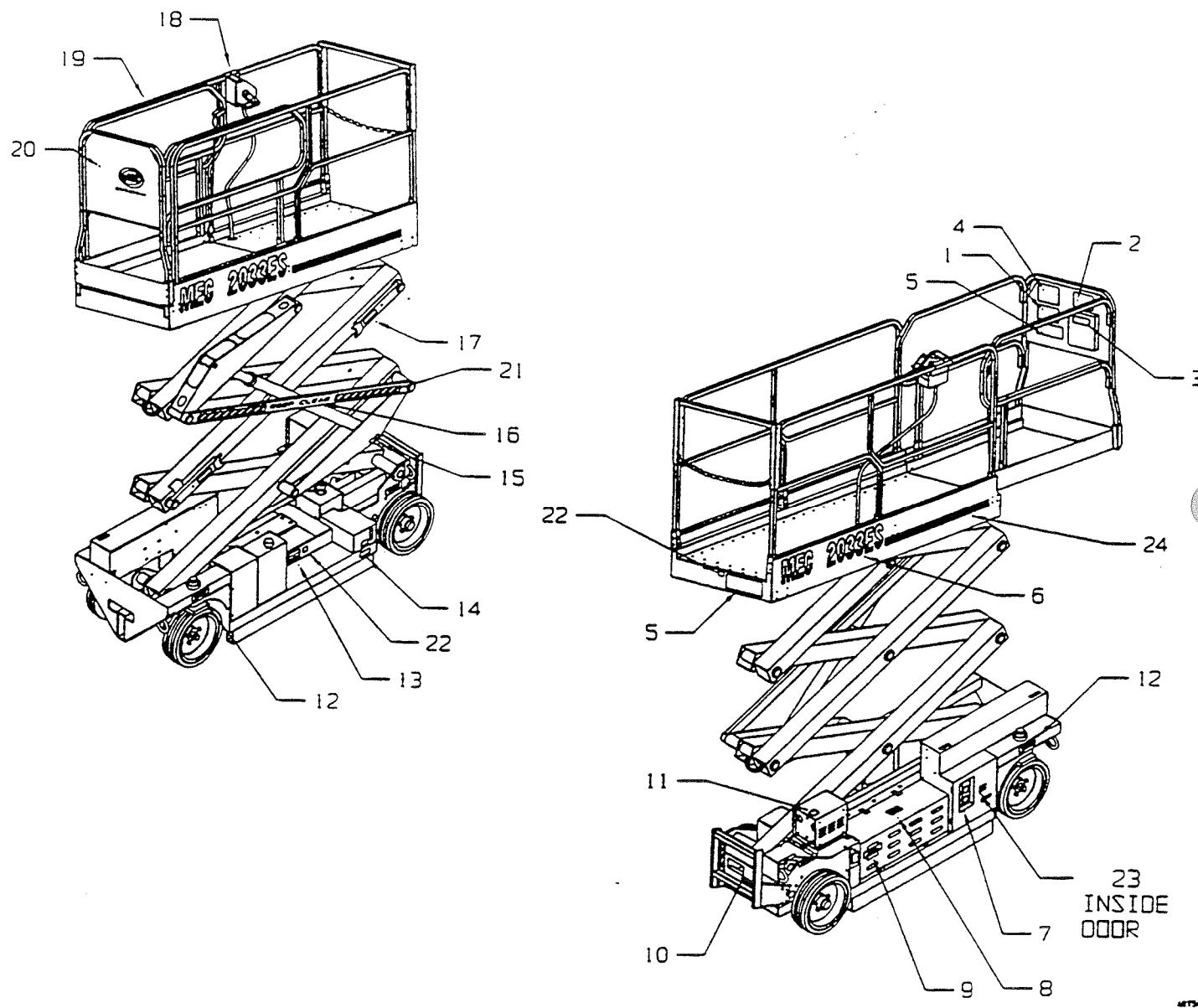


Figure 9-1. 2033ES Decals

ITEM	PART NO.	QTY.	DESCRIPTION
1	7523	1	DECAL - CAUTION-ELEC/T.O. HAZARD
2	8767	1	DECAL - LOCK WARNING
3	8911	1	DECAL - MANUAL CASE
4	7527	1	DECAL - CAUTION
5	8768	2	DECAL - 800 LB CAPACITY
6	8765	2	DECAL - MODEL NUMBER 2033ES
7	8788	1	DECAL - CONTROL BASE
8	8520	1	DECAL - WARNING BATTERY REPLACEMENT
9	8475	1	DECAL - BATTERY DISCONNECT
10	6556	1	DECAL - FORK POCKETS
11	8779	1	DECAL - BATTERY CHARGER
12	8519	2	DECAL - WARNING TIRE REPLACEMENT
13		1	SERIAL NUMBER PLATE
14	8598	1	DECAL - EMERGENCY DOWN PROCEDURE
15	8599	1	DECAL - EMERGENCY DOWN PROCEDURE
16	8503	1	DECAL - KEEP CLEAR
17	6794	2	DECAL - MAINTENANCE
18	8946	1	DECAL - PLATFORM STOPS SHORT
19	7155	1	DECAL - CONTROL BOX
20	8811	1	DECAL - MEC OVAL
21	7982	2	DECAL - SAFETY STRIPE, KEEP CLEAR
22	8619	2	DECAL - MADE IN USA
23	8603	1	DECAL - WARNING DISCONNECT BATTERY
24	8402	2	DECAL - RAIL STRIPE

ART548 R3
BM12024
7/30/97

Figure 9-1. 2033ES Decals

