

RT Series

SERVICE & PARTS MANUAL



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 purchase 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.



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INTRODUCTION

This manual consists of Service and Parts illustrations sections.

The Service Section of this manual is designed to provide you, the customer, with the instructions needed to properly maintain the MEC self-propelled scissors lift. When used in conjunction with the illustrated parts section and the Operators Manual (provided separately), this manual will assist you in making necessary adjustments, repairs, identifying, and ordering the correct replacement parts.

All parts represented here are manufactured and supplied in accordance with MEC's quality standards.

We recommend that you use Genuine MEC parts to insure proper OPERATION and reliable PERFORMANCE.

To obtain maximum benefits from your MEC scissors lift, always follow the proper operating and maintenance procedures. Only trained authorized personnel should be allowed to operate or service this machine. Service personnel should read and study the Operator's, Service and Parts Manuals in order to gain a thorough understanding of the unit prior to making any repairs.

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



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



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



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



NOTE: The best method to protect yourself and others from injury or death is to use common sense. If you are unsure of any operation, <u>don't start</u> until you are satisfied that it is safe to proceed and have discussed the situation with your supervisor.

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



MODIFICATIONS OF THIS MACHINE FROM THE ORIGINAL DESIGN AND SPECIFICATIONS WITHOUT WRITTEN PERMISSION FROM MEC ARE STRICTLY FORBIDDEN. A MODIFICATION MAY COMPROMISE THE SAFETY OF THE MACHINE, SUBJECTING OPERATOR(S) TO SERIOUS INJURY OR DEATH.

MEC's policies and procedures demonstrate our commitment to Quality and our relentless ongoing efforts towards Continuous Improvement, due to which product specifications are subject to change without notice.

Any procedures not found within this manual must be evaluated by the individual to assure oneself that they are "proper and safe."

Your MEC Scissors Lift has been designed, built, and tested to provide many years of safe, dependable service. Only trained, authorized personnel should be allowed to operate or service the machine.

MEC, As Manufacturer, Has No Direct Control Over Machine Application And Operation. Proper Safety Pratices Are The Responsibility Of The User And All Operating Personnel.

If There Is A Question On Application And/Or Operation Contact:



Aerial Work Platforms
Mayville Engineering Co., Inc.

An Employee Owned Company

210 Corporate Drive - Box 990 • Beaver Dam, WI 53916-0990 USA

Ph: 1-800-387-4575 • 920-887-2518 • Fax: 920-887-2480

E-mail: awp@mayvl.com • Web: www.mayvl.com



Machine Specifications - 2591RT

	T 04 ()	To 45	
Working Height	31 ft	9.45 m	
	atform Height 25 ft 7.62 m		
Stowed Height:	100.75 in	2.56 m	
Folded Down Rails	71.00 in	1.80 m	
Lift Capacity (Evenly Distributed):	1,750 lbs	795 kg	
Roll-out Deck Capacity	500 lbs	227 kg	
Platform Dimensions:			
With Roll-Out Deck	72x132x44.5 in	1.83x3.35x1.13 m	
Guard Rail Height	43.5 in	1.10 m	
Toe Board Height	7.0 in	18 cm	
Roll-out Deck Length	48.0 in	1.22 m	
Overall Length	11 ft 11.5 in	3.64 m	
Overall Width	91.0 in	2.31 m	
Wheel Base	Wheel Base 87.5 in 2.22 m		
Wheel Track	77.0 in	1.96 m	
Turning Radius:			
Inside	6 ft 1.0 in	1.85 m	
Outside	15 ft 8.0 in	4.78 m	
Ground Clearance	11.25 in	28.58 cm	
Machine Weight (Unloaded) (Approx.)	7,125 lbs	3,239 kg	
Drive System (Proportional):			
Drive Speed (Platform Elevated)	0 - 0.8 mph	0 - 1.29 kph	
Drive Speed (Platform Lowered)	0 - 2.0 mph	0 - 3.20 kph	
Lift/Lower Speed (Approx.)			
Gradeability	23° / 42%		
Ground Pressure/Wheel (Maximum)	14.8 psi	1.02 bar	
Wind Speed (Maximum)	28 mph	45 kph - 12.5 mps	
Tire Size-Standard (Super Terra Grip - Pneumatic)	· · · · · · · · · · · · · · · · · · ·		
Tire Pressure (Not Applicable For Foam Filled Tires)	38 psi	2.62 bar	
Wheel Lug Nut Torque	85 ft lbs	115 Nm	
Hydraulic Pressure:			
Main System	3,000 psi	207 bar	
Lift System	2,000 psi	138 bar	
Steer	1,500 psi	103 bar	
Hydraulic Fluid Capacity	30 gal	113 liters	
Fuel Capacity	17 gal 64 liters		
Power System – Voltage	12 Volts DC		
Alternator	16 amp		
Engine Availability:	, , , , , , , , , , , , , , , , , , ,		
Standard -Kubota DF 750-E, 23 HP (17kW	/), Dual Fuel, Liqui	d Cooled	

Optional - Kubota D1005-E, 20 HP (15kW), Diesel, Liquid Cooled

Machine Specifications - 3391RT

	T 00 (1	440	
Working Height	39 ft	11.9 m	
Platform Height	33 ft	10.1 m	
Stowed Height:	108 in	2.7 m	
Folded Down Rails	78 in	2.0 m	
Lift Capacity (Evenly Distributed):	1,250 lbs	568 kg	
Roll-out Deck Capacity	500 lbs	227 kg	
Platform Dimensions:	_		
With Roll-Out Deck	72x132x44.5 in	1.83x3.35x1.13 m	
Guard Rail Height	43.5 in	1.10 m	
Toe Board Height	7.0 in	18 cm	
Roll-out Deck Length	48.0 in	1.22 m	
Overall Length	11 ft 11.5 in	3.64 m	
Overall Width	91.0 in	2.31 m	
Wheel Base	87.5 in	2.22 m	
Wheel Track	77.0 in	1.96 m	
Turning Radius:			
Inside	6 ft 1.0 in	1.85 m	
Outside	15 ft 8.0 in	4.78 m	
Ground Clearance	11.25 in	28.58 cm	
Machine Weight (Unloaded) (Approx.)	7,725 lbs	3,511 kg	
Drive System (Proportional):			
Drive Speed (Platform Elevated)	0 - 0.8 mph	0 - 1.29 kph	
Drive Speed (Platform Lowered)	0 - 2:0 mph	0 - 3.20 kph	
Lift/Lower Speed (Approx.)	30 - 35 sec / 38	- 43 sec	
Gradeability			
Ground Pressure/Wheel (Maximum)	15 psi 1.11 bar		
Wind Speed (Maximum)			
Tire Size-Standard (Super Terra Grip-Pneumatic)			
Tire Pressure (Not Applicable For Foam Filled Tires)			
Wheel Lug Nut Torque	85 ft lbs	115 Nm	
Hydraulic Pressure:			
Main System	3,000 psi	207 bar	
Lift System	2,250 psi	155 bar	
Steer	1,500 psi	103 bar	
Hydraulic Fluid Capacity	30 gal	113 liters	
Fuel Capacity	17 gal	64 liters	
Power System – Voltage			
Alternator	16 amp		
Engine Availability:			
Standard -Kubota DF 750-E, 23 HP (17kW	/), Dual Fuel, Liqui	d Cooled	
Optional - Kubota D1005-E, 20 HP (15kW), Diesel, Liquid Cooled			

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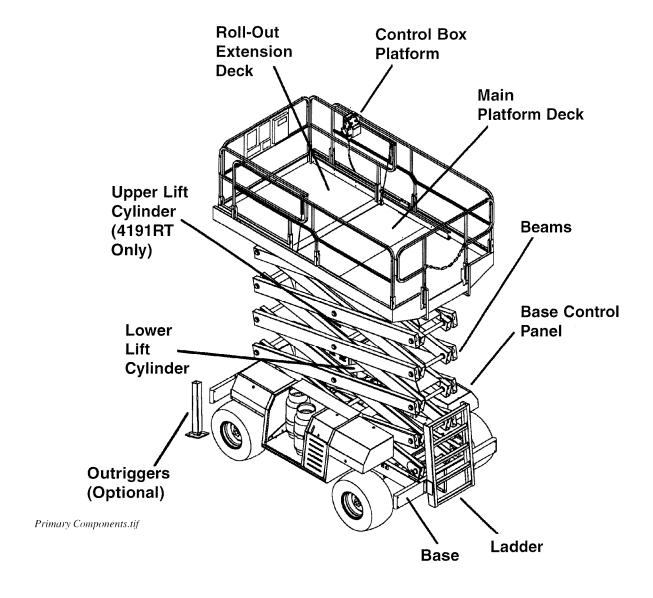
Machine Specifications - 4191RT

Working Height	47 ft	14.30 m
Platform Height	41 ft	12.50 m
Stowed Height:	117.0 in	2.97 m
Folded Down Rails	87.5 in	2.22 m
Lift Capacity (Evenly Distributed):	1,000 lbs	455 kg
Roll-out Deck Capacity	400 lbs	182 kg
Platform Dimensions:		
With Roll-Out Deck	72x132x44.5 in	1.83x3.35x1.13 m
Guard Rail Height	43.5 in	1.10 m
Toe Board Height	7.0 in	18 cm
Roll-out Deck Length	48.0 in	1.22 m
Overall Length	11 ft 11.5 in	3.64 m
Overall Width	91.0 in	2.31 m
Wheel Base	87.5 in	2.22 m
Wheel Track	77.0 in	1.96 m
Turning Radius:		
Inside	6 ft 1.0 in	1.85 m
Outside	15 ft 8.0 in	4.78 m
Ground Clearance	11.25 in	28.58 cm
Machine Weight (Unloaded) (Approx.)	10,100 lbs	4,581 kg
Drive System (Proportional):		
Drive Speed (Platform Elevated)	0 - 0.8 mph	0 - 1.29 kph
Drive Speed (Platform Lowered)	0 - 2.5 mph	0 - 4.02 kph
ift/Lower Speed (Approx.) 35 - 40 sec / 48 - 52 sec		
Gradeability	21.8° / 40%	
Ground Pressure/Wheel (Maximum)	17.7 psi	1.26 bar
Wind Speed (Maximum)	28 mph	45 kph - 12.5 mps
Tire Size (Super Terra Grip - Calcium filled)	31 x 15.5 x 15 in	79 x 39 x 38 cm
Tire Pressure (Not Applicable For Foam Filled Tires)	-	-
Wheel Lug Nut Torque	85 ft lbs	115 Nm
Hydraulic Pressure:		
Main System	3,000 psi	207 bar
Lift System	2,250 psi	155 bar
Steer	1,500 psi	103 bar
Hydraulic Fluid Capacity	30 gal	113 liters
Fuel Capacity	17 gal	64 liters
Power System - Voltage	12 Volts DC	
Alternator	37 amp	
Engine Availability:		

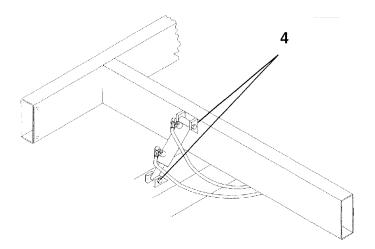
Standard-Ford VSG-413P(1.3 L), 32 HP(24kW), Dual Fuel, Liquid Cooled Optional- Kubota D1305B-1, 30 HP (22kW), Diesel, Liquid Cooled



Primary Machine Components

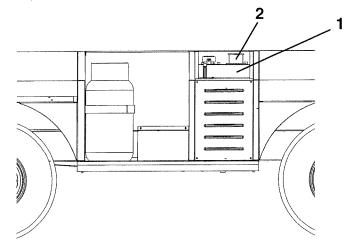


LUBRICATION DIAGRAM

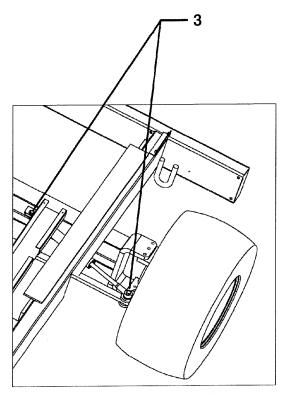


AxleLub.tif

Axle Lubrication



Hydraulic Lubrication



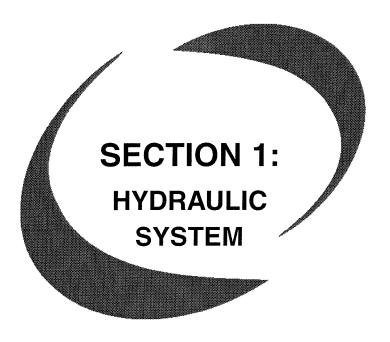
Steering Cylinder Pivots Lubrication

SteerLub.tif

LUBRICATION CHART

NO.	ITEM	SPECIFICATION	FREQUENCY OF LUBRICATION
1	Hydraulic Reservoir	Anti-Wear 150 SSU (ISO 32/mil spec 0-5606) Fill To The Top Of The Sight Gauge With Platform In The Stowed Position.	Check Daily. Analyze Every Six (6) Months Or 500 Hours. Change Yearly Or Every 1,000 Hours, Whichever Occurs First.
2	Hydraulic Filter	Filter Element	Change Every Six Months Or 500 Hours, Whichever Occurs First For Normal Usage. Change Every Three Months Or 300 Hours, Whichever Occurs First For Severe Usage.
3	Steering Cylinder Pivot	Gear Oil - EP 90 Add A Few Drops To Each Pivot Point.	Weekly Or Every 25 Hours, Whichever OccursFirst.
4	Axle Lock	Lithium N.L.G.I. #2 EP Purge Old Grease.	Weekly Or Every 25 Hours, Whichever Occurs First.

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HYDRAULIC SYSTEM- GENERAL

The hydraulic system is an open center, open- loop type. Generally in this type of system, hydraulic fluid is provided by a positive fixed displacement pump which is directly coupled to the engine. As the engine turns, the hydraulic pump drains oil from the reservoir and pumps this fluid to the valve package.

If no function is selected to perform, fluid will bypass the valve (manifold) package through a dump valve and return to tank. Each function has a maximum pressure control limit set by pressure relief valves.

Hydraulic integrated circuit, generally known as the manifold system (valve type) is designed to control all or part of machine functions by integrating various hydraulic cartridge valves into a manifold to provide directional, pressure, flow, and load control.

HYDRAULIC FLUID

HANDLING PRECAUTIONS



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

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



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

FLUID LEAKS UNDER PRESSURE MAY NOT ALWAYS BE VISIBLE.



Fluid Recommendations

MEC recommends the use of ISO Grade 32 hydraulic fluid. A 150SSU EQUIVALENT substitute can be used if absolutely necessary. Mineral-based hydraulic fluids produced by different companies will USUALLY mix with each other satisfactorily, but this IS NOT RECOMMENDED. When in doubt, consult with your supplier.

ISO Grade 32 has proven to be suitable for use in all climates. For continued operation in temperatures below 32° F (0°C), use of an ATF hydraulic fluid is satisfactory.

The only exception to the above is to drain and fill the system with ATF oil or its equivalent. This will also start up at temperatures down to -20 degrees F (- 29 degrees C). However, use of this oil will give poor performance at temperatures above 120 degrees F (49 degrees C).

Hydraulic Fluid Analysis

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

- Anytime the hydraulic pump is replaced.
- If fluid discoloration is noticed in the hydraulic reservoir sight gauge tube.
- If after the first 50 hours of operation, the hydraulic filter element is plugged.
- Anytime the hydraulic filter element shows signs of metal contamination.
- Once every six (6) months, under normal operating conditions.
- Every three (3) months, in extremely dusty or dirty operating conditions.

The hydraulic fluid analysis must be done by a qualified laboratory. Always provide the following information with the test sample.

- Type of hydraulic fluid (see lubrication chart for recommended hydraulic fluid and/or your records).
- Model and Serial number of machine from which sample was taken.
- Purpose of analysis: pump failure, discoloration, etc.
- Type of analysis: complete to show additive breakdown, acid buildup, viscosity, type and percent of contaminants; also, comparison to new fluid and recommendations.

Following the above guidelines will prevent premature failure of pumps, cylinder seals, drive motors, and unnecessary downtime.

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



System Flushing Procedure

- 1. With platform fully down, drain hydraulic fluid from hydraulic reservoir into a clean, empty container. Use an oil filter cart so the fluid may be reused if analysis is good.
- 2. When the hydraulic reservoir is empty, remove suction strainer and hoses.
- 3. Remove return line hoses on the hydraulic reservoir.
- 4. Remove the bypass filter and hose.
- 5. Flush the hoses with clean hydraulic fluid.
- 6. Discard old bypass filter element and replace.
- 7. Flush out the tank with hoses removed from the hydraulic reservoir.
- 8. Reinstall all hoses removed in the previous steps.
- 9. Fill hydraulic reservoir with filtered, fresh hydraulic fluid (refer to Lubrication Chart).
- 10. Loosen output hose fittings at pump to flood with hydraulic fluid. Tighten fittings.
- 11. Start up the machine. Briefly operate all functions. Two or three lift cycles may be necessary to purge all air from lift cylinder(s).
- 12. When the above procedures have been completed, fill hydraulic reservoir to full mark on sight gauge.
- 13. Check all leaks and correct as necessary. Machine is now ready to be placed back in operation.

NOTE: AVOID MIXING PETROLEUM AND SYNTHETIC BASE OILS. IT IS NOT ADVISABLE TO MIX OILS OF DIFFERENT BRANDS OR TYPES, EXCEPT AS RECOMMENDED.



HYDRAULIC SYSTEM COMPONENTS

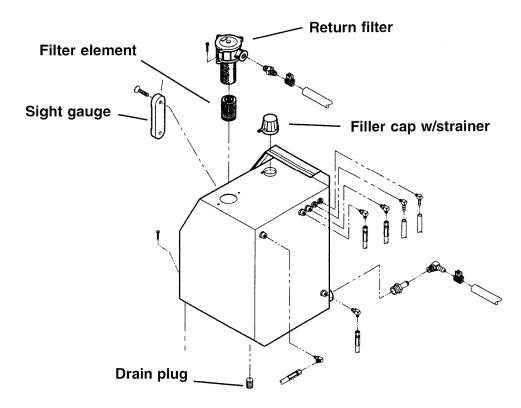
Hydraulic Fluid Reservoir

This consists of the tank, a filler cap with breather, a drain plug, a sight gauge, and a bypass filter with a 10 micron filter element.

Perform the following steps weekly:

- Check tank for signs of leakage.
- Inspect tank securing bolts for tightness.

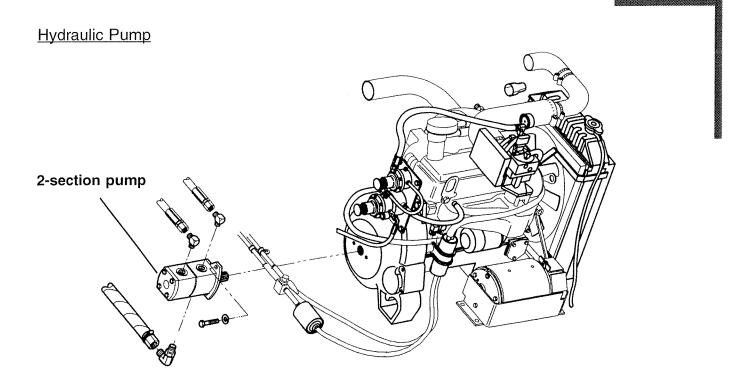
Hydraulic Filter



Hydraulic Reservoir Assembly

All machines are produced with a filter. It is a 10 micron spin-on, bypassing filter. When the filter is clogged, hydraulic flow bypasses the filter element. The filter element must be changed every 6 months or 500 hours. Extremely dirty conditions may require that the filter be replaced more often.

Beware of hot oil. Contact with hot oil may cause severe burns.

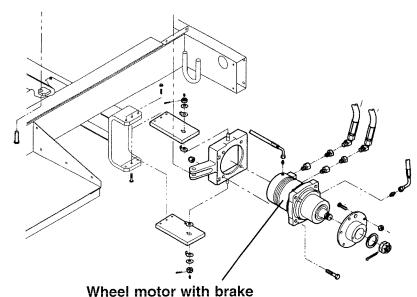


A gasoline or optional Diesel engine drives the fixed displacement, two- section gear pump. The pump provides hydraulic fluid flow to operate the machine functions at 10 GPM (2591RT & 3391RT), 14 GPM (4191RT) and 5 GPM. There are no adjustments on the pumps. The front pump section provides power for the lift, drive, brakes and floatation (articulating axle) functions. The rear pump section provides power for the outriggers (optional), steering, and front brake release functions.

Wheel Drive Circuit

There are four (4) hydraulic, fixed-displacement gear wheel motors to provide power to all four wheels [two (2) front and two (2) rear].

Dynamic Braking Circuit



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Front and rear brakes are released whenever the machine is commanded to drive. As the proportional valve is signaled, valve "J" selects the drive direction, valve "P" closes and valve "Q" energizes to provide pressure to release the brakes.

As the drive joystick is returned to neutral, the proportional valve closes, valves "J", "Q" and "P" de-energize simultaneously. Valve "P" opens and allows the motors to decelerate across the .083" dia. orifice. Valve "Q" vents the brake pressure to tank, metering the pressure across the .031" orifice. This allows the brakes to apply at a regulated rate.

While driving down a grade, the counterbalance valve "I" prevents the motors from running ahead of the pump. This maintains a controlled drive rate down a grade.

Pressure reducing valve "M" is used to limit the max. pressure to the brakes.

Parking Brake and Towing Circuit

When the machine is stopped, valve "Q" vents the brakes, so that they are set to hold the machine. In order to tow the machine for service purposes, the brakes can be manually released in the following manner:

- Valve "N" is closed
- Valve "AX is opened, to allow free-flow across the drive motors.
 The external hand-pump can then be operated to build brake pressure.
- Valves "X", "W" and "N" trap the pressure and prevent the brakes from gradually reapplying.

When the machine is ready to be driven, valve "AX" is closed and the machine is started. When the machine is commanded to drive, valve "N" opens from pilot pressure applied to the cartridge, and it remains open.

Floatation (Articulating Axle) Circuit

The brakes are released by energizing valve "Q" in drive mode. When valve "Q" energizes, this also provides pilot pressure to unseat the (Pilot Operated) PO checks at the floatation lock cylinders. Oil is allowed to freely pass from the rod end to the base end of the other cylinder. This allows the rear axle to pivot. Note that the floatation system is locked while in the lift mode.

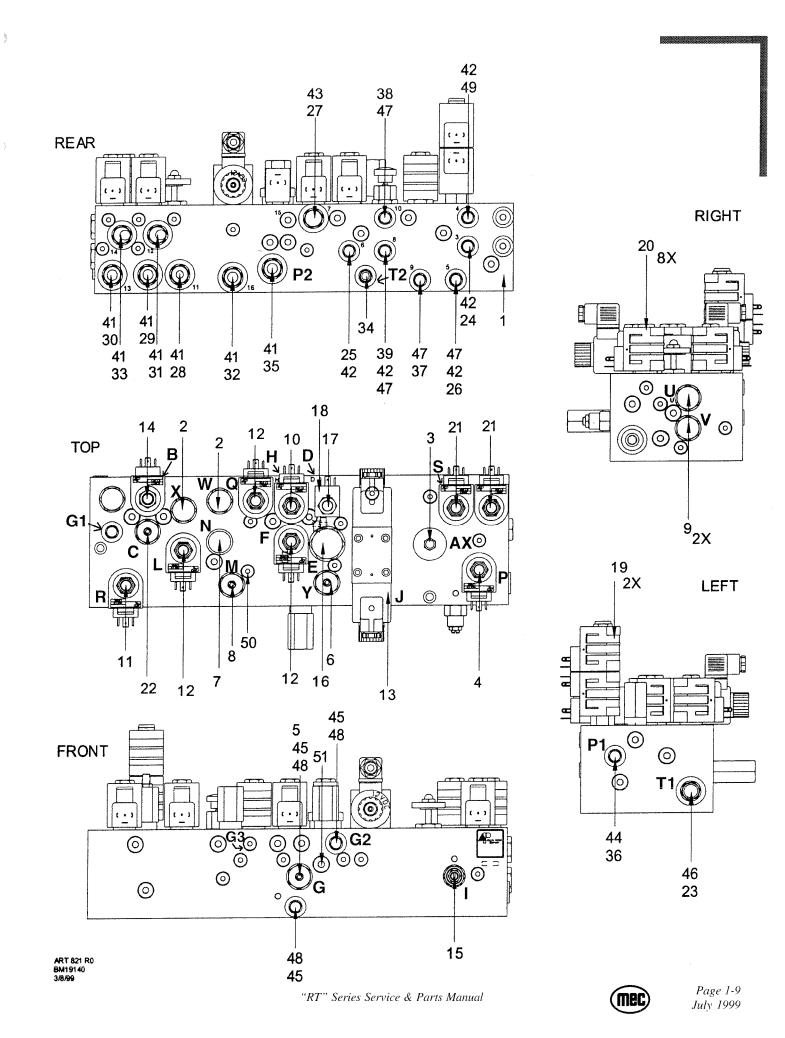
Steering Circuit

The steering system consists of the following components:

- The wheel motor housings have pivots on the top and bottom, and are mechanically linked together via a tie-rod.
- Steering is accomplished hydraulically by using two double-acting cylinders, and a 4w3p solenoid-operated, hydraulic directional control cartridge valve (valve "B").







- Valve "R" is used to unload the pump when neither the steer nor stabilizer system is being actuated.
- To allow steering without dragging the front wheels when the machine is stationary, the front brakes are released independently of the rear. In this mode, when valve "B" is operated, valve "L" is also energized to provide pressure to the front brakes, while the rear brakes remain depressurized.
- Maximum steering pressure is limited by the relief valve "C".

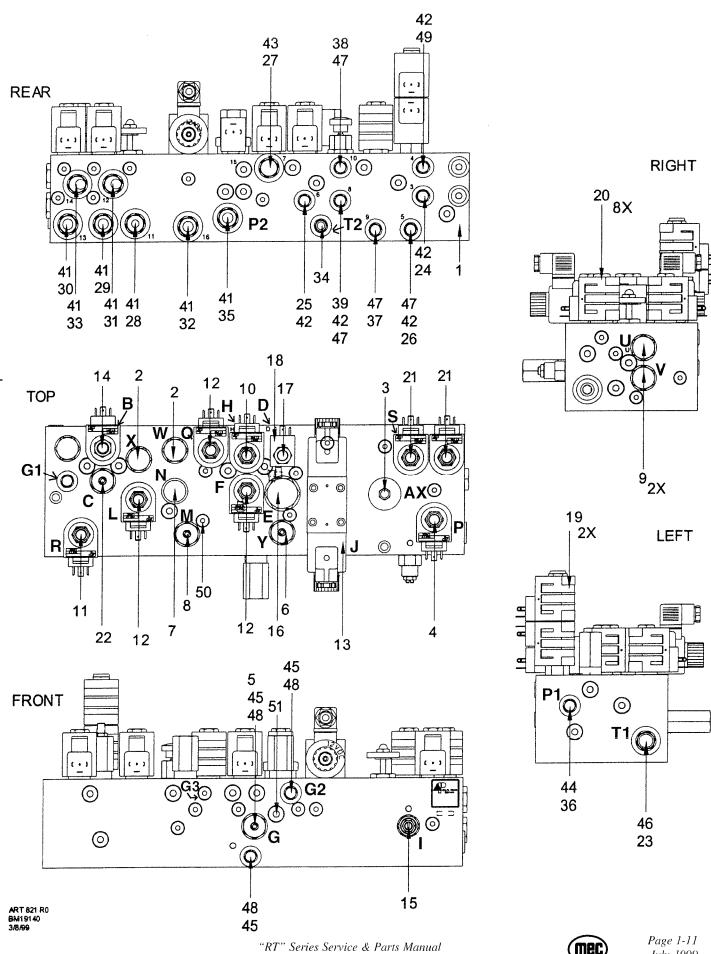
Platform Lift Circuit

- Valves "D" & "E" provide proportional flow control to raise the lift cylinders, through lift valve "F".
- Lowering speed is controlled by a fixed, Uni.-directional orifice. This is located at the cylinder hose junction. Locating the orifice near the cylinder provides good stability while lowering.
- The normally closed poppet valve "H" and independent normally closed poppet valves located at the cylinder ports lock the lift cylinders in place and serve as the lowering valves.
- Valve "G" provides the maximum pressure limit for the lift circuit
- Independent relief valves located at the lift cylinders prevent one cylinder from buckling in the event that the platform is heavily loaded and the hose at the other cylinder breaks.
- The hand pump, manual 4w2p and PO checks make up the manual lowering circuit.
- The 4w2p is spring loaded to vent the PO checks' pilot lines to tank. This is so that the lowering operation will immediately stop upon releasing the 4w2p.

Outrigger/ Stabilizer Circuit

- 4w3p cartridge valve "A" is used to select extend or retract for the stabilizers. Valve "R" must close to provide pump flow.
- Individual operation of each stabilizer cylinder is provided by only energizing the two 2w NC valves at the desired cylinder.





VALVES-THEORY OF OPERATION

Cartridge Valve: This is a self contained, screw in type valve that could be a flow, pressure, directional, or load holding device.

Directional Control Valve: This type of valve, redirects pump fluid to the actuator to provide movement. It also allows the exhaust fluid from the actuator to pass through the valve to the tank. In the cartridge form, it could be a three (3) position or a two (2) position valve.

Valves marked "A", "B", "F", "L", "T", "S", and "Q" are directional valves of the cartridge type. Valve marked "J" is **not** the cartridge valve and it is known as DO3.

<u>Three Position</u>: Valves "A", "B", and "J" are three (3) directional control valves that are three (3) position in the neutral or center position. These valves allow the pump flow to pass through the center of the valve in the de-energized position and block the actuator ports to pump on tank. Examples are "A" and "B" or a closed center position, like valve "J".

Also, these valves can be energized to a second or third position by energizing either coils of the valve. In either case, it allows pump fluid to enter the actuator and the exhaust oil from the actuator to the tank.

<u>Two Position</u>: These valves have only one coil and can only be put in the second position. The function of these valves is the same as the three (3) position valves with the exception of having only two (2) positions.

Valves "F", "L", "Q", "T", and "S" are five (5) directional valves that are two (2) position.

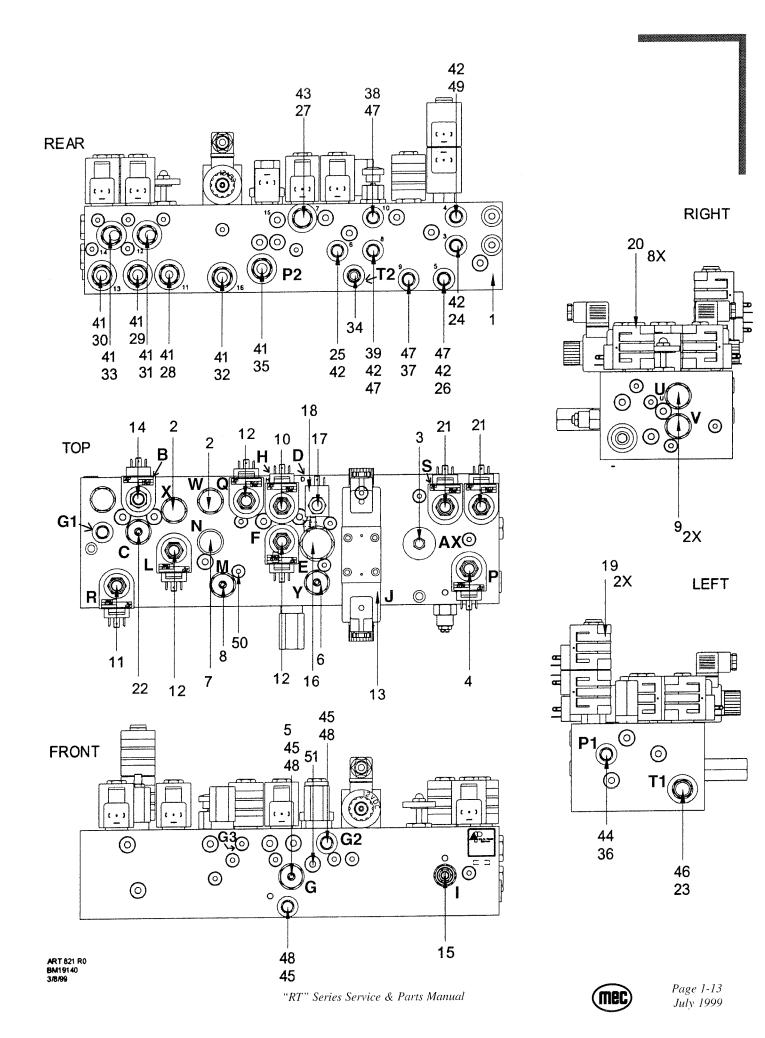
Flow Control Valves: Valves of this type control the amount of hydraulic fluid to the actuators either mechanically or electrically. Examples of these valves are "D", "AX", "U" and "V".

<u>Proportional</u>: This type of valve works by sending a controlled electrical current to the coil. The amount of current signal to this valve dictates the amount of flow passing through the valve. Valve "D" is the proportional flow control.

<u>Mechanical</u>: this type of valve could be either fixed or adjustable by either having the adjustable knob to set the flow rate, or by setting internal orifices cartridge itself. Valve marked "AX" is the adjustable type and valves "U" and "V" are internally fixed.

<u>Pressure Compensated</u>: This valve works like a compensation element that has a fixed spring setting with the same pressure drop across the valve. This valve will not allow any undesired oil to pass through based on minimum and maximum system pressure settings. The valve "E" provides pressure compensation to valve "D" which is electrically driven. Also, valves "U" and "V" are pressure compensated internally.





VALVES-THEORY OF OPERATION (Continued)

<u>Non-Pressure Compensated</u>: This type of valve has a fixed or variable orifice that allows hydraulic oil to pass from one side to the other. The amount of oil that flows through is dependent on the available pressure, which means the set flow varies with different pressures. Valve marked "AX" is a non-pressure compensated type.

<u>Pressure Control</u>: This controls maximum pressure to each function. This type of valve is also known as relief or pressure reducing valve. Valves marked "C", "G", "M", and "Y" are pressure control valves.

<u>Load Holding</u>: This has very low internal leakage that would not allow the load from moving when the machine is in the stowed or rested condition. Valves "H" and "I" are the load holding valves.

<u>Check</u>: Allows oil to go from one side to the other and prevents oil from the opposite side to enter. Valves marked "W" and "X" are check valves.

Manual Push: This is a two (2) position valve that manually can be pushed to close: Example: valve marked "N".

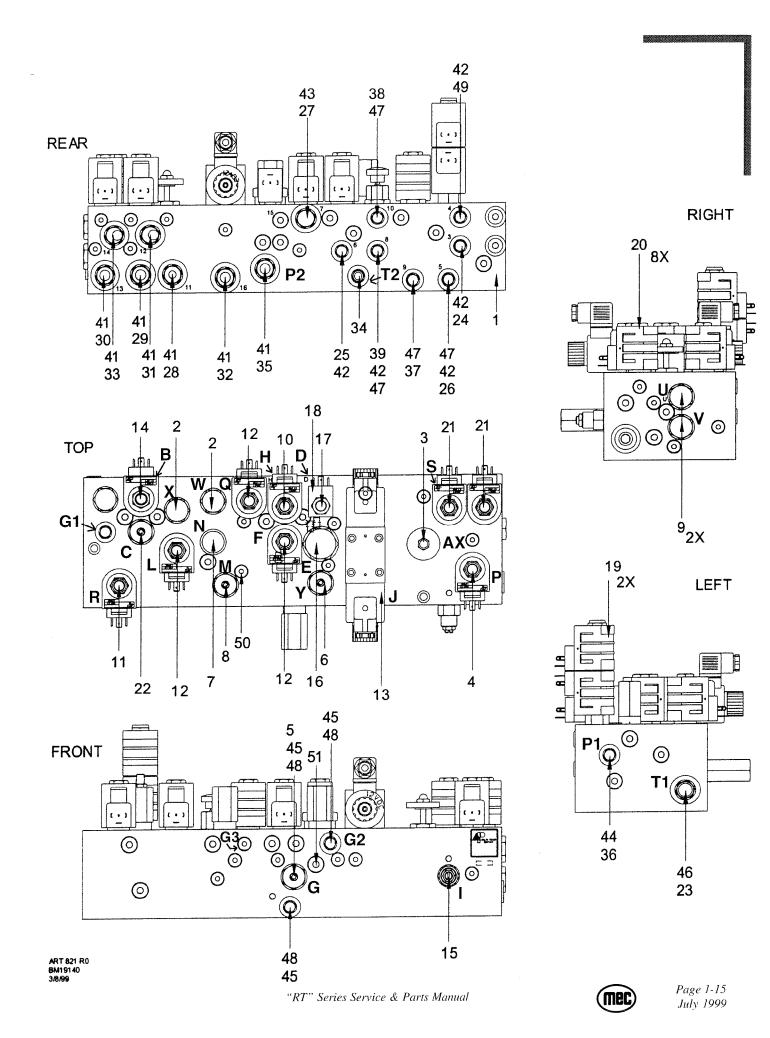
<u>Solenoid Operated</u>: This has an electrical coil which upon receipt of voltage will activate the valve to shift from one position to the other. Valves marked "A", "B", "D", "F", "H", "J", "L", "P", "Q", "R", "S", and "T" are all solenoid operated valves.

<u>Flow Divider/Combiner</u>: This is a pressure compensated flow control valve that divides and combines incoming fluid based on the internally set flow ratios. Examples are valves "U" and "V".

<u>Counterbalance</u>: This valve prevents the load from over running, based on the inertia of the machine during the downhill travel. This valve is also known as load holding valve and valve "I" is an example.

<u>Bypass/Dump</u>: This allows the pump fluid to pass through and enter into the tank once the engine is running and no function is activated. It could either be a solenoid operated like valve "R" or a pure mechanical such as valve "E".





Lift Cylinder

There is one hydraulic cylinder in the 2591RT and the 3391RT scissors lift circuit. There are two (2) hydraulic lift cylinders in the 4191RT scissors lift circuit. Cylinder(s) are of the single acting type. Refer to the Mechanical Section of this manual for cylinder disassembly, or replacement.

Each cylinder has an integrated 2-position, 2-way solenoid operated platform lower valve and a counter balance valve for holding the platform in position The counter balance valve is also externally piloted via a hand pump for manually lowering the platform.

The holding valve (counterbalance) prevents retraction of the cylinder rod should a hydraulic line rupture or a leak develop between the cylinder and its related control valve.

Steer Cylinder

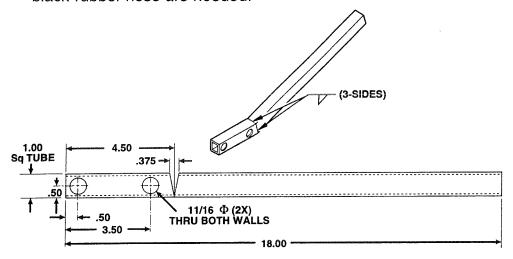
There are two (2) cylinders utilized in the steering system. These cylinders are a double acting type which requires oil flow to operate the cylinder rod in both directions. Directing oil forces the piston to travel towards the rod end of the barrel, extending the cylinder rod. By directing oil to the rod side of the cylinder the piston will be forced in the opposite direction and the cylinder rod will retract. Refer to the Mechanical Section of this manual for cylinder disassembly, or replacement.

Lock Cylinder

There are two (2) lock cylinders utilized in the articulating axle.

Bleeding Axle Lock Hydraulic System

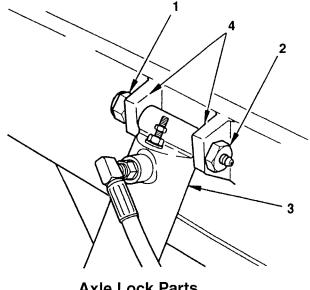
NOTE: A special tool is needed to perform this procedure. A drawing of tool with all pertinent information is provided in the figure below. Also, a 5/8"diameter X 5-1/4" long bolt and matching nut and a 3/16" inside diameter X 12 feet long black rubber hose are needed.





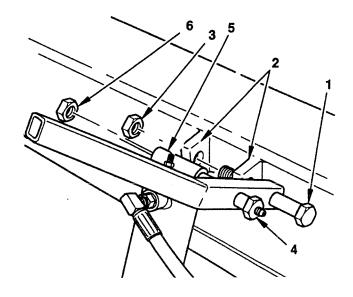
Bleeding Axle Lock Hydraulic System (Continued)

1. Remove lock nut (1, in Figure below) and upper cylinder pin (2) and pull axle locking cylinder (3) out of brackets (4).



Axle Lock Parts

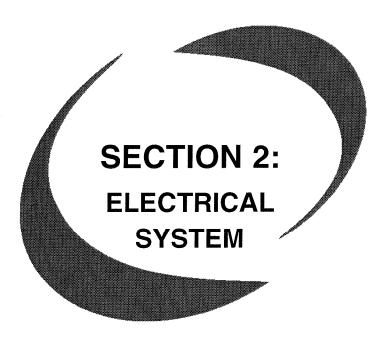
- 2. Insert bolt (1) in Figure below (5/8" X 5-1/4") through bottom hole of tool and through brackets (2) and install a 5/8" nut (3). Do not overtighten nut - tool should pivot freely on pin.
- Insert upper cylinder pin (4) through upper hole of tool and through upper end (5) of cylinder. Secure with lock nut (6). Do not overtighten locknut - tool should pivot freely on bolt.



Bleed Tool Mounting

-Outrigger Cylinder

There are four (4) hydraulic cylinders in this optional outrigger circuit. The cylinders are of the double acting type. Refer to the Mechanical Section of this manual for cylinder disassembly, or replacement.



ELECTRICAL SYSTEM- GENERAL

The electrical control system consists of a ground control station and a platform station. These two communicate with each other via serial communication under a microprocessor based system. The system has a total of 48 possible inputs ranging from switches and joysticks to temperature and pressure sensors. It also has 32 on/off outputs and 12 PWM outputs (6-axis). The system is designed to withstand a temperature range of –40 to +85 degrees Celsius. The controller boards are also dipped in silicon compound making the system highly resistive to moisture.

The control system for operation of drive/steer and lift/lower are electric-over-hydraulic type. The drive system has a proportional pulse control system giving infinite speed control from zero to full travel speed. The ground control station primarily is used as an auxiliary control station. It enables operator to operate all functions except steering and drive.

The platform control station located on the platform contains the controls for drive/steer and lift/lower. Momentary bi-directional rocker switch on the drive controller handle provides the steering function.

BATTERY

A 12 volt battery supplies the electrical power required to operate the electrical circuits.

Battery Maintenance (in storage)

Follow these procedures for maintenance of battery on a machine not in use:

- Keep battery clean. Electrolyte of "wet" batteries should be checked regularly and kept at proper level.
- Never stack one battery directly on top of another because post or container damage can result. If batteries are stored individually, place supporting boards between layers. Rotate stock so that the oldest batteries are used first.
- "Wet" batteries should be kept fully charged. A "wet" battery, while in storage, should be recharged to full charge at recommended intervals.

A battery fully (100%) charged at 80° F (26.6°C)

- drops to 65% at 32°F (0°C)
- drops to 40% at 0°F (-32°C)

Recommended Intervals

If Stored At:	Recharge:
Below 40°F (4°C)	None required
Above 60°F (15°C)	Every month
40°-60°F (4°-15°C)	Every 2 months



Battery Maintenance (in use)

Check battery and surrounding area for signs of damage or corrosion.

Check battery terminals for:

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

Check battery electrolyte level. Replenish the electrolyte, if necessary. Remove vent caps before filling, and USE ONLY DISTILLED WATER. DO NOT OVERFILL. Fill to level indicator (or ½ inch over the top of separators, if there is no level indicator). Fill after charging to prevent overflow of acid due to expansion. Do not use a hose to add water to batteries.

Allowing the electrolyte level to drop below the top of the separators will lead to shortened battery life.

Excessive water usage can indicate that a battery has been overcharged, has been subjected to excessively high temperatures, or is nearing the end of its service life.

Battery Preventative Maintenance:

Every 15 hours (after battery has been charged), spot-check the specific gravity of two or more cells. A fully charged battery should indicate 1.28 specific gravity. If low readings are noted, check the following:

- Check terminals for corrosion, loose connections and broken or frayed cables.
- Check all cells with a hydrometer for variance in specific gravity. A variation of 0.03 points or more between cells is a cause for concern. Mark the low cells.

Recheck specific gravity of all cells after recharging. Wash the top of the battery, making sure all vents are in place. Do not allow cleaning water or other foreign matter to enter the cells. Use a solution of bicarbonate soda (5 tsp. of baking soda per quart of warm water) and water to wash the battery if there is an accumulation of acid.

Battery Replacement

To remove battery, follow these procedures.



BEFORE REMOVING THE BATTERY FROM THE MACHINE, TURN OFF THE SELECTOR/ KEY SWITCH. THERE SHOULD BE NO POWER.

Battery is located in the engine side compartment of the machine.

Always disconnect the negative battery cable first.

Remove bolts ('J') holding battery. Lift the battery from the compartment. Put the battery to the side and dispose off properly.



Always connect the positive battery cable first.

To install battery, reverse the process by positioning the battery in the compartment securely with hold down bolts. Connect battery cables.

Movement Alarm (OPTIONAL)

This alarm is activated as soon as the platform control console joystick (controller) lever is moved off the center "Neutral" position.



THE MOVEMENT ALARM IS PROVIDED FOR YOUR PROTECTION, AND PROTECTION OF PERSONS WORKING IN THE IMMEDIATE AREA. DISABLING THIS IMPORTANT SAFETY DEVICE MAY RESULT IN SERIOUS INJURY OR DEATH.



Tilt Alarm

A warning indicator light provided at the platform console will give a visual warning when machine is at an unsafe angle; lift function is disabled in this condition.

An audible warning is activated once machine is in the raised position and reaches an unsafe angle; drive function is disabled in this condition.

Tilt Alarm Test

This can be tested by manually tipping the sensor. This "Push-To-Test" feature enables tilt alarm to be tested without losing its adjustment. Individually push down on each of the three fastened corners of the tilt alarm. There should be enough travel to cause the alarm to sound as each corner is pressed. (There is approximately a three second delay). If the alarm does not sound, the flange nuts have been tightened too far. Loosen the nut on the 90° corners and repeat this test procedure.

Tilt Alarm Sensor Adjustment

- Before attempting to adjust the alarm, park the machine on a firm, flat, lever surface. Use of an inclinometer is recommended to ensure front and rear of chassis is level.
- Open the base control panel to access the sensor. Adjust the three flange nuts until the bubble on top of the sensor is centered.
- Check that the electrical connections are correct and secured tight.
- Close/shut the base control panel.

Relay

The relays are located inside the engine compartment (Refer to the schematic at the end of this manual for relay functions and interconnect).

Limit Switch

There are limit switches to prevent driving in high speed when the platform is raised above approximately 10 feet (3.04 meters), then machine will be in the slow speed mode (2591RT and 3391RT). When the platform is raised to approximately 33 feet (10.05 meters), machine will have reduced drive pressure without sacrificing the slow speed.

Emergency Stop Button

There are two red emergency stop buttons: one located on the platform control console and the other on the base control panel.

This stop button, when in the ON (OUT) position, provides power to the desired control station. Also, the stop button, in the event of an emergency can be used to turn off the power by pushing "IN". All functions stop immediately when depressed.

Turn the button clockwise to reset.

NOTE: As a safety feature, selecting and operating the base controls will override the platform controls, except the platform emergency stop button.

The base control emergency stop button will stop all machine operations, even if the selector switch is switched to platform controls.

Selector Switch

Machine can be operated from the base/ground or platform controls. Activation of one or the other is achieved with this switch.

With the platform controls selected, from the base control panel, if the platform up/lower function is operated there should be NO movement. Similarly with the base controls selected, from the platform control console if any machine function is operated, there should be NO movement.

Horn

It is activated at the platform controls and sounds at the ground alerting ground personnel to clear the machine's path to avoid hazards or unsafe conditions.

Master Disconnect Switch

Battery disconnect is provided to facilitate servicing and also to prevent unauthorized use of vehicle by using a padlock (to provide security).

Microprocessor Based System

The System consists of a ground control station and a platform control station. These controls communicate with each other via serial communication (two wire). This system has a total of 48 possible inputs ranging from switches and joysticks to temperature and pressure sensors. It also has 32 on/off outputs and 12 PWM outputs (6 axis). A four character alphanumeric display on the ground controller board updates the operator of any vital information, such as shorts or open connections to the coils or joysticks.

The System can withstand a temperature range of -40 to +85 degree Celsius. The controller boards are dipped in a silicon compound which makes the system HIGHLY resistive to moisture. The unit monitors also the processor activities. In case there is a program or processor failure, it will return the system to its reset safe.

There are 12 proportional (6 axis) Pulse Width Modulated outputs with 3 ampere capacity and short circuit, overload protection. Each output is designed with individual adjustments for Threshold (Start of function movement), Max. Output setting and Ramp. Pulse Width Modulation frequency (also known as dither frequency) is adjustable from 27 Hz to 600 Hz to accomodate most major brand of PWM and servo valves.

On/Off Inputs are designed with 32 (16 ground, 16 platform) digital (switched to 12 DVC) inputs. Each input is protected from transient voltages up to 60 VDC.

16 analog inputs are designed to receive signal from analog sensors like joysticks. The input range is 0 to 5 VDC (with 50 V transient protection), 10 bit (1024 steps) resolution.

The System is designed with an integrated 4-Character Alpha-numeric red LED intelligent Display. This display is used to report the status of the sensors, outputs, serial communication, etc to the machine operator. (See error code chart at the end of the Electrical Troubleshooting Section of this manual).

A standard full duplex RS-232 port is designed to allow to communicate via a two wire shielded cable.



Continuity Checks

Check Toggle Switch:

- Disconnect wires and connect one probe of ohm meter to the connection on toggle switch and other probe on other connection.
- When toggle is open, there should be no reading, and when closed there should be a low reading.

Check Selector Switch

- Disconnect wires and connect one probe to common of switch and the other to normally open terminal.
- With the switch flipped, there should be a low resistance.

Check Emergency Stop Button

- Disconnect wires and connect one probe of other meter to connection on button and other probe on other connection.
- There should be no reading with the button pressed and a low resistance with it reset.

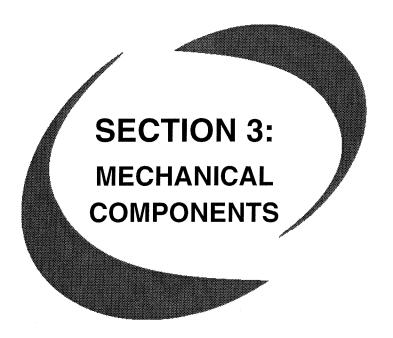
Check Relay Operation

- With one connection grounded, apply voltage to other relay connection.
- Confirm normally closed contacts are opening and vice-versa.

Check Limit Switch Operation

- · Disconnect wires.
- With one probe of ohm meter to common and other probe to open contact, move limit switch arm. Low resistance should be seen.
- With one probe of ohm meter to common and other probe to closed contact, low resistance should be seen. Move limit switch arm and no resistance should be seen.

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MECHANICAL COMPONENTS

Following is a description of the major mechanical components of the scissors lift.

Chassis/ Undercarriage



When steam cleaning the base/ undercarriage, cover electrical components to prevent water penetration.

Steam clean the chassis as necessary, and inspect all welds and brackets. Check for cylinder pins that turn in their mounting, which will indicate sheared retaining pins.

Tires

Inspect for cuts, chunking, side-wall damage, or abnormal wear. Any tire faults MUST BE CORRECTED before further machine operation. Refer to Illustrated Parts Catalog for replacement tires.



FAILURE TO USE APPROVED PARTS MAY CAUSE DEATH OR SERIOUS PERSONAL INJURY.

NOTE: Replace tires with the correct tires to maintain the rating of this equipment.

Changing Tires



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

When a tire change is necessary, follow these tips:

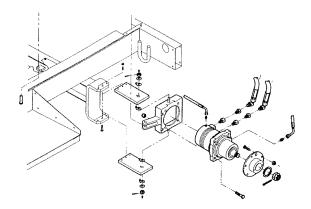


ALWAYS BLOCK THE WHEELS BEFORE RAISING THE MACHINE.

- 1. Chock tires on one end of machine and raise the other end of machine.
- Loosen and remove lug nuts and pull wheel off.



- 3. Install the replacement wheel.
- 4. Fasten lug nuts and tighten to proper torque.
- 5. Lower the machine and remove the chocks.

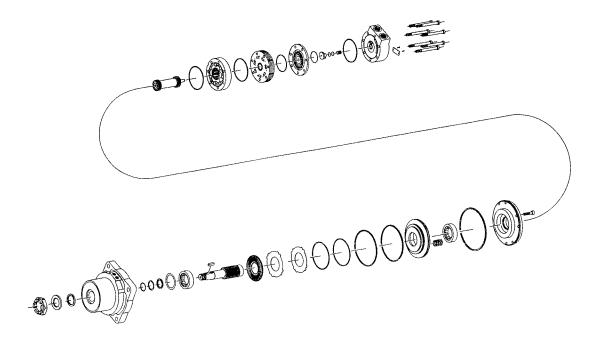


Drive Motor Brakes

There are four (4) drive motor brakes. Two (2) on the steer axle and two (2) on the drive axle. These can be damaged or leaks may occur; repair or replace as necessary.

To replace drive motor brake:

Remove the wheel and tire assembly to access drive motor.



Steer Cylinder

There are two (2) double acting type steer cylinders on this machine. During operation, cylinder(s) should not leak, but a slight damping at the rod seal is acceptable. The pins should be checked for wear.

To replace steer cylinder:



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

- 1. Disconnect hydraulic hoses and cap them.
- 2. Remove the pins and cotter pin holding the steer cylinder to the motor mounting bracket.
- 3. Remove the pin and cotter pin holding the steer cylinder to the steer axle cross member.



- 4. Carefully lift off the steer cylinder.
- 5. Position the new steer cylinder and install pin and cotter pin to hold cylinder to the steer axle cross member.
- 6. Install pin and cotter pin to hold cylinder to motor mounting bracket.
- 7. Connect hydraulic hoses.

Cylinder Seal Replacement



Take care not to damage rod surface and guard against dirt on other foreign objects entering system.

- 1. Drain all oil from cylinder.
- 2. Clean all dirt and grit from outside of cylinder.
- 3. Insert cylinder into vise.
- 4. Remove cylinder retainer using a spanner wrench inserted in the holes provided in the head: you might have to use sharp pointed object to start retainer removal thru the slotted barrel.
- 5. Remove the shaft assembly from the barrel, pulling in a straight lie, so as not to scar the internal parts.
- 6. Insert shaft into a **soft jawed** vise so that the head and piston can be removed. Be sure the shaft and vise are both clean before using.
- 7. Remove nut at the end of the shaft and pull head and piston off of the rod.
- 8. Remove all seals from the head and piston using a non-sharp seal tool. These tools are available from various seal suppliers.
- 9. Clean all oil and debris off of the head, piston, shaft, collar and barrel using solvent, rags, and an air hose.
- 10. Inspect all parts for any wear or damage, if damage is found replace with new part.
- 11. Reinstall all seals on the head and piston using the non-sharp seal tool.
- 12. Place a small amount of oil on the inside seals of the head and reinstall it on the shaft, by slipping head over the piston end of the shaft being very careful not to damage the inside seals.
- 13. Place a small amount of oil on the inside seals of the piston and reinstall it on the shaft by slowly twisting the piston on over the threads of the shaft being very careful not to damage the inside seals.

Cylinder Seal Replacement (Continued)

- 14. Reinstall the shaft nut; torque 3/4" nut to 160 Ft-lbs.
- 15. Grease the outside seals of the head and piston.
- 16. Reinstall the shaft into the barrel of the cylinder and push in until groove of the head lines up with the slot in the barrel.
- 17. Reinstall the cylinder retainer with the use of the spanner wrench.
- 18. Cycle the cylinder using air to check for proper operation.

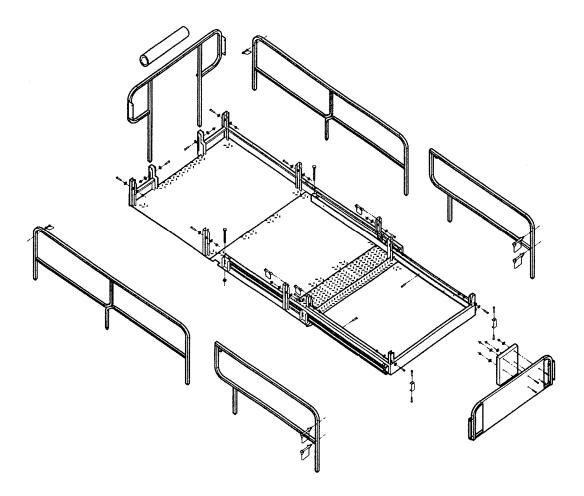
NOTE: It is very important to keep all parts clean when working with hydraulic cylinders, even one small piece of dirt or grit can damage the cylinder.

Hoses and Cables.

Inspect all hoses and electrical cables for security and damage. Hoses and cables should be examined for rubbing and chafing. Check for leaks at fittings. Replace any damaged hoses or cable. (Refer to the Parts Section.)

Platform Removal

- 1. Raise platform about three (3) feet (1.0 m) and block the arms in the raised position. Also, connect overhead crane by appropriate lifting device to platform.
- 2. Disconnect all platform wires.
- 3. Remove the bolts from each platform bracket at the rear of the machine.
- 4. Slide platform and roll out deck off the machine.



Platform Removal



TROUBLESHOOTING

GENERAL TROUBLESHOOTING TIPS

Before investigating a malfunction, check the following items:

- Check that battery connections are secure and battery if fully charged.
- Check that the emergency stop button is released (UP/OUT position).
- Check that the hydraulic fluid is at the correct level.
- Check that the brake release valve is open.
- Check that the circuit breaker is in the "ON" position.

Common Causes of Hydraulic System Malfunctions:

- Incompatible hydraulic fluids mixed, destroying the additives and causing varnish build up, resulting in the valves sticking.
- Water in the hydraulic fluid due to a damp climate.
- Improper hydraulic fluid used. Viscosity too high in cold climates. Viscosity too low in warm climates.

NOTE: ISO Grade 32, Anti Wear Hydraulic Oil, is a multiple viscosity oil that is light enough for cold climates and resists thinning in warm climates.

Following is a step by step basic troubleshooting guide.

NOTES: Contamination always causes failure in any hydraulic system. It is very important to be careful not to introduce any contamination into your hydraulic system during the assembly procedures. Please make sure all ports and cavities of the manifold and cylinders are properly covered while other works are performed during the assembly of the machine.

Troubleshooting of the hydraulic integrated system (Manifold) can be easily accomplished by using a series of cavity plugs designed for the troubleshooting of the manifold. MEC has already established these plugs.

ITEM	PART NO.	DESCRIPTION	PRESSURE SETTINGS (PSI)
MA-1	9656	MANIFOLD ASSY WITH OUTRIGGERS (15 GPM)	
MA-1	9657	MANIFOLD ASSY NO OUTRIGGERS (15 GPM)	Makeumber
MA-2	20601	MANIFOLD ASSY E-DOWN	
МА-3	20635	MANIFOLD ASSY PIVOT AXLE	
MA-4	20395	LIFT CYLINDER ASSY	
MA-S	20589	JUNCTION BLOCK ASSEMBLY	
Α	9041	4W3P TANDEM CENTER VALVE	
В	9041	4W3P TANDEM CENTER VALVE	
С	9711	RELIEF VALVE	1500
D	9517	CARTRIDGE 4G SPOOL	
E	9670	PRESSURE COMP REG VALVE	
F	6976	3W2P SPOOL VALVE	
G	9663	RELIEF VALVE 2591RT	2000
Н	6973	2W NC VALVE	
	9669 COUNTERBALANCE VALVE		1500
J	9668	4W3P D03 VALVE	
L	6976	3W2P SPOOL VALVE	_
М	M 9666 PRESSURE REDUCING VALVE		500
N	N 9665 MANUAL VALVE (FREE WHEELING)		_
Р	6975	2W SPOOL VALVE	
Q	6976	3W2P SPOOL VALVE	
R	9511	2W NO VALVE	
5	8373	4W2P TAN CTR SPOOL VALVE	_
Т	8373	4W2P TAN CTR SPOOL VALVE	***************************************
U	9667	FLOW DIVIDER/COMBINER	
V	9667	FLOW DIVIDER/COMBINER	
W	W 9504 CHECK VALVE		
Х	9504	CHECK VALVE	
Υ	9664	RELIEF VALVE	
М	8849	HYDRAULIC HAND PUMP VALVE	
AB	8848	MANUAL PULL 4-WAY VALVE	

ITEM	PART NO.	DESCRIPTION	PRESSURE SETTINGS (PSI)
AC	7445	PILOT OPERATED BALL CHECK VALVE	
AD	6973	N.C. POPPET 2-WAY VALVE	
AE	9768	ORIFICE, UNIDIRECTION (.098)	
AF	9769	RELIEF, TAMPER PROOF VALVE	2450
AX	9505	NEEDLE VALVE (FREE WHEELING)	
	9672	COIL 12 VDC	<u></u>
	9519	COIL 12 VDC	
	9520	COIL 12 VDC	
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ITEM	PART NO.	DESCRIPTION	PRESSURE SETTINGS (PSI)
MA-1	9445	MANIFOLD ASSY (10 GPM) WITH OUTRIGGERS	
MA-1	9467	MANIFOLD ASSY (10 GPM) NO OUTRIGGERS	
MA-2	20601	MANIFOLD ASSY E-DOWN	
МА-3	20635	MANIFOLD ASSY PIVOT AXLE X91	
MA-4	20862	LIFT CYLINDER ASSY	
Α	9041	4W3P TANDEM CENTER VALVE	
В	9041	4W3P TANDEM CENTER VALVE	
С	9711	RELIEF VALVE	1500
D	9671	CARTRIDGE 4G SPOOL	
Е	9670	PRESSURE COMP REG VALVE	
F	6976	3W2P SPOOL VALVE	
G	9663	RELIEF VALVE 2591RT	2000
G	9663	RELIEF VALVE 3391RT	2250
Н	6973	2W NC VALVE	
l	I 9669 COUNTERBALANCE VALVE		1 500
J	9668 4W3P D03 VALVE		CARACTER STATE OF THE STATE OF
L	L 6976 3W2P SPOOL VALVE		
М	M 9666 PRESSURE REDUCING VALVE		500
N	N 9665 MANUAL VALVE (FREE WHEELING)		
Р	6975	2W SPOOL VALVE	**************************************
Q	6976	3W2P SPOOL VALVE	
R	9511	2W NO VALVE	
5	8373	4W2P TAN CTR SPOOL VALVE	
Т	8373	4W2P TAN CTR SPOOL VALVE	
U	9667	FLOW DIVIDER/COMBINER	
V	V 9667 FLOW DIVIDER/COMBINER		
W	W 9504 CHECK VALVE		
Х	9504	CHECK VALVE	-
Υ	9664	RELIEF VALVE	—
М	8849	HYDRAULIC HAND PUMP VALVE	
AB	AB 8848 MANUAL PULL 4-WAY VALVE		

ITEM	PART NO.	DESCRIPTION	PRESSURE SETTINGS (PSI)
AC	7445	PILOT OPERATED BALL CHECK VALVE	
AD	6973	N.C. POPPET 2-WAY VALVE	
AE	9767	ORIFICE, UNIDIRECTION (.093)	
АХ	9505	NEEDLE VALVE (FREE WHEELING)	
	9672	COIL 12 VDC	
	9519	COIL 12 VDC	
	9520	COIL 12 VDC	
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:			
	11 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
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TROUBLESHOOTING CHART - HYDRAULIC

FUNCTION	SYMPTOM	REMEDY
Steering	No front brake release.	Check pressure on gauge G1.
		Should be 1500 PSI when Steer only.
	~	Hold a magnetic wrench on the end of both valves "R" and "B" when steering switch is activated and hold the switch. If voltage gets to the coil, the wrench will be magnetized. If pressure is 0 to 100 PSI, check voltage on valve "R" it should be 12 VDC. If 12 VDC is supplied to valve "R", Check voltage on valve "B". It should be 12 VDC.
		Check voltage on valve "L". It should be 12 VDC. Check 0.031 Dia. orifice under valve "X" for possible contamination.
	No steering pressure.	Check voltage on valves "R" & "B", it should be 12 VDC. Check relief pressure setting of valve "C", it should be 1500 PSI.
	No steering to left or right.	Check pressure on gauge G1, it should be 1500 PSI. Check voltage on valves "R" and "B", it should be 12 VDC. Check valve "B" for possible contamination.
Stabilizers	Cylinders don't extend	Check pressure on gauge G1, it should be 1500 PSI. Check voltage on valves "R" and "A", it should be 12 VDC. Check voltage on normally closed solenoid valves in the rod end of the stabilizer cylinders, it should be 12 VDC. Check valve "A" for possible contamination.
	Cylinders don't retract.	Check pressure on gauge G1, it should be 1500 PSI. Check voltage on valves "R" and "A", it should be 12 VDC. Check voltage on normally closed solenoid valves in the base end of the stabilizer cylinders, it should be 12 VDC. Check valve "A" for possible contamination.
Lift	Platform doesn't raise.	Check pressure on Gauge G2, it should be 2000 PSI. Check voltage for valve "F", it should be 12 VDC. Check current for valve "D", it should be 420 to 700 ma. Check valve "E" for contamination. Check voltage for valve "H", it should be 0. Remove coil on valve "F" and start Lift command. Pressure on Gauge G2 should be 3000 PSI; if it is lower than that, adjust relief valve "Y" to 3000 PSI. Check pressure on Gauge G3. It should be 2000 PSI; if it is lower than that, adjust relief valve "G" to 2000 PSI.

TROUBLESHOOTING CHART - HYDRAULIC (Continued)

SYMPTOM	REMEDY
Slow down platform speed.	Check the unidirectional orifice in the base end of the platform cylinder for possible contamination. Check the same orifice for proper size. 0.083 to 0.093 dia. Check valve "F" for possible velocity shifting.
Platform doesn't lower manually.	Check manual valve by the hand pump to see if it is working. Make sure the manual hand pump is working.
No forward motion.	Check drive pressure on gauge G2. It should be 3000 PSI. If not, remove forward coil on valve "J" and move handle in forward direction. Pressure on G2 should be 3000 PSI. If it is lower, adjust relief valve "Y" to 3000 PSI.
	Check valve "E" for contamination. Check valve "D" for proper current signal. It should be 420 to 700 mA. Check valve "D" for contamination. Check valve "AX" to see if it is fully closed. Check valve "Q" for proper voltage. It should be 12 VDC. Check brake pressure on port "10". It should be 500 PSI. If it 0 to 150 PSI, adjust pressure on valve "M" to 500 PSI.
No reverse motion.	Check drive pressure on gauge G2. It should be 3000 PSI. If not, remove reverse coil on valve "J" and move handle in reverse direction. Pressure on G2 should be 3000 PSI. If it is lower, adjust relief valve "Y" to 3000 PSI.
	Check valve "E" for contamination Check valve "D" for proper current signal. It should be 420 to 700 mA. Check valve "D" for contamination. Check valve "AX" to see if it is fully closed. Check valve "Q" for proper voltage. It should be 12 VDC. Check brake pressure on port "10". It should be 500 PSI. If it is 0 to 150 PSI, adjust pressure on valve "M" to 500 PSI.
Slow speed in either forward or reverse directions.	Check valve "D" for proper current signal. It should be 700 mA. Check valve "E" for contamination. Check valve "D" for contamination. Check Valve "J" for proper voltage. It should be 12 VDC. Check valves "T" and "S" for voltage. It should be 0 VDC. Check valve "AX" for partial or full opening. It must be closed. Check pump RPM. Check pump flow at high idle. It should be 9.4 to 10 GPM. This can be done by placing a flow meter between pump output and P2 port of the manifold.
	Slow down platform speed. Platform doesn't lower manually. No forward motion. No reverse motion.

TROUBLESHOOTING CHART - HYDRAULIC (Continued)

FUNCTION	SYMPTOM	REMEDY
Drive (cont'd)	Machine doesn't climb the proper grade.	Check pressure on gauge G2. It should be 3000 PSI. Check voltage on valves "T" and "S". It should be 12 VDC. Check pressure at ports "11" or "12" depending upon drive directions. It should be 2700 PSI minimum.
	Machine doesn't stop smoothly.	Check voltage on deceleration valve "P". It should be 0 VDC. Check 0.083 dia. orifice under valve "P" for possible contamination.
Brakes	Pressure can't be built manually.	Check manual push valve "N" to see if it holds pressure. Once this valve is pushed in the closed position, by pumping oil with the manual hand pump, pressure should be built to disengage the brakes.

SEE APPENDIX

SEE APPENDIX

Troubleshooting Chart - Electrical

PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Platform will not raise from base or platform	Faulty up valve coil or wiring	EC05 on control board indicates faulty coil or wiring. Replace coil and/or repair wiring
	Faulty up valve	Replace up valve
	Faulty down valve	Replace down valve
	Faulty or misadjusted relief valve	If relief pressure is below 2000 psi, adjust relief pressure or replace relief valve
	Faulty lower control board	Replace lower control board
Platform will not raise	Faulty lift switch	Replace lift switch
from base only	Faulty lower control board	Replace lower control board
	Faulty wiring	Inspect and repair wiring
Platform will not raise from platform only	Faulty upper control board	Replace platform control box
Platform raises slow or erratic	Faulty platform control box	If voltage across joystick potentiometer is more than 0.5 VDC when in full lift and more than 4.5 VDC before reaching full down then joystick potentiometer requires adjustment
	Faulty or misadjusted relief valve	If relief pressure is below 2000 psi, adjust relief pressure or replace relief valve
	Faulty lift cylinder(s)	Repair or replace lift cylinder(s)
	Faulty up valve	Replace up valve
	Faulty down valve	Replace down valve
	Faulty emergency down valve	Replace emergency down valve
Platform will not lower from base or platform	Faulty down valve coil or wiring	ECO6 on control board indicates faulty coil or wiring. Replace coil and/or repair wiring
	Faulty down valve	Replace down valve
	Faulty up valve	Replace up valve
	Faulty lower control board	Replace lower control board
Platform will not lower from base only	Faulty lift switch	Replace lift switch

PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Platform will not lower	Faulty lower control board	Replace lower control board
from base only (cont'd)	Faulty wiring	Inspect and repair wiring
Platform will not lower from plafform only	Faulty upper control board	Replace upper control box
Platform lowers slow or erratic	Faulty lift cylinder(s)	Repair or replace lift cylinder(s)
erratic	Faulty down valve	Replace down valve
	Faulty up valve	Replace up valve
	Down orifice in down hydraulic line obstructed	Remove orifice and clear obstruction
Platform will not lift and machine will not drive in forward or reverse	Faulty proportional valve	If current at proportional valve coil is more than 630 mA with joystick in full forward or reverse then replace proportional valve
or Platform lifts slowly and machine drives slowly in forward and	Faulty proportional valve coil	If resistance of proportional valve coil is more than 10 ohms or less than 5 ohms then replace proportional valve coil
reverse	Faulty lower control board	If voltage across proportional valve coil is less than 5 VDC with joystick in full forward or reverse then replace lower control board
	Faulty wiring to proportional valve coil	Inspect and repair wiring
	Faulty pressure compensator	Replace pressure compensator
	Safety switch harness disconnected	Reconnect safety switch harness
	Faulty or misadjusted pressure relief valve	If relief pressure is below 3000 psi, adjust relief pressure or replace relief valve
Steering inoperative in	Faulty steering valve	Replace steering valve
both directions	Faulty bypass valve coil or wiring	EC16 on control board indicates faulty coil or wiring. Replace coil and/or repair wiring
	Faulty bypass valve	Replace bypass valve
	Faulty steering brake valve coil or wiring	EC07 on control board indicates faulty coil or wiring. Replace coil and/or repair wiring
	Faulty steering brake valve	Replace steering brake valve

PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Steering inoperative in both directions (cont'd)	Faulty or misadjusted relief valve	If relief pressure is below 1500 psi adjust relief pressure or replace relief valve
Steering inoperative in	Faulty steering valve	Replace steering valve
either right or left	Faulty left/right steering coil or wiring	EC12 on control board indicates faulty coil or wiring on steer right coil. EC13 indicates faulty coil or wiring on steer left coil. Replace coil and/or repair wiring.
	Faulty upper control board	Replace platform control box
	Faulty lower control board	Replace lower control board
No motion in forward	Faulty drive valve	Replace drive valve
and no motion in reverse	Faulty brake valve coil or wiring	EC11 on control board indicates faulty coil or wiring. Replace coil and/or repair wiring.
	Faulty brake valve	Replace brake valve
	Faulty pressure reducing valve	Replace pressure reducing valve
	Faulty steering brake valve	Replace steering brake valve
	Faulty upper control board	Replace plafform control box
3	Faulty lower control board	Replace lower control board
Motion is slow in forward and motion is	Faulty counterbalance valve	If drive pressure is above 1300 psi, replace counterbalance valve
slow in reverse	Faulty decel valve coil or wiring	EC11 on control board indicates faulty coil or wiring. Replace coil and/or repair wiring.
	Faulty decel valve	Replace decel valve
	Disconnected or faulty slow speed switch	Connect or replace slow speed switch
	Faulty slow speed switch wiring	Inspect and repair wiring
No motion in forward or no motion in reverse	Faulty drive valve	Replace drive valve
or no monon in reverse	Faulty forward/reverse valve coil or wiring	EC14 on control board indicates faulty coil or wiring on forward coil. EC15 indicates faulty coil or wiring on reverse coil. Replace coil and/or repair wiring.
	Faulty lower control board	Replace lower control board

PROBABLE CAUSE	REMEDY/SOLUTION
Faulty platform control box	If voltage across joystick potentiometer is less than 4.5 VDC when in full forward and less than 0.5 VDC before reaching full reverse then joystick potentiometer requires adjustment
Faulty platform control box	If voltage across joystick potentiometer is more than 0.5 VDC when in full reverse and more than 4.5 VDC before reaching full forward then joystick potentiometer requires adjustment
Faulty counterbalance valve	Replace counterbalance valve
Brake orifice obstructed	Remove orifice and clear obstruction
Faulty choke solenoid or wiring	EC04 on control board indicates faulty solenoid or wiring. Replace solenoid and/or repair wiring
Choke solenoid misaligned	Realign solenoid
Faulty choke switch	Replace choke switch
Faulty lower control board	Replace lower control board
Faulty wiring from switch to control board	Inspect and repair wiring as required
Faulty glow plug relay or wiring	EC04 on control board indicates faulty glow plug relay or wiring. Replace relay and/or repair wiring
Faulty glow plug timer or glow plugs	Refer to engine service manual
Faulty lower control board	Replace lower control board
Faulty wiring from switch to control board	Inspect and repair wiring as required
Faulty throttle relay or wiring	EC28 on control board indicates faulty throttle relay or wiring. Replace relay and/or repair wiring
Faulty throttle solenoid	Replace throttle solenoid
Faulty throttle switch	Replace throttle switch
Faulty lower control board	Replace lower control board
Faulty wiring from switch to control board	Inspect and repair wiring as required
	Faulty platform control box Faulty counterbalance valve Brake orifice obstructed Faulty choke solenoid or wiring Choke solenoid misaligned Faulty choke switch Faulty lower control board Faulty wiring from switch to control board Faulty glow plug relay or wiring Faulty glow plug timer or glow plugs Faulty lower control board Faulty wiring from switch to control board Faulty wiring from switch to control board Faulty throttle relay or wiring

PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Throttle does not remain energized	Faulty throttle solenoid or wiring	EC27 on control board indicates faulty throttle solenoid or wiring. Replace solenoid and/or repair wiring
	Misadjusted throttle sole- noid	Readjust throttle solenoid
Fuel solenoid does not operate (diesel only)	Faulty lower control board	Replace lower control board
	Faulty fuel relay or wiring	EC30 on control board indicates faulty fuel relay or wiring. Replace relay and/or repair wiring
	Faulty fuel solenoid	Replace fuel solenoid
Fuel solenoid does not	Faulty lower control board	Replace lower control board
remain energized (diesel only)	Faulty fuel solenoid or wiring	EC29 on control board indicates faulty fuel solenoid or wiring. Replace solenoid and/or repair wiring
Engine does not start	Faulty start relay or wiring	EC03 on control board indicates faulty start relay or wiring. Replace start relay and/or repair wiring
	Faulty starter	Refer to engine manual
	Faulty wiring or battery	Inspect and repair/service as requried
Movement alarm does not operate	Faulty movement alarm or wiring	EC09 on control board indicates faulty movement alarm or wiring. Replace faulty alarm and/or repair wiring. Note: EC09 will appear on control board during motion if movement alarms are not installed.
	Faulty lower control board	Replace control board
Horn does not operate	Faulty horn or wiring	EC10 on control board indicates faulty horn or wiring. Replace horn and/or repair wiring.
	Faulty horn switch	Replace horn switch
	Faulty upper control board	Replace platform control box
	Faulty lower control board	Replace lower control board
When base/plafform selector switch is in platform, no functions operate	Faulty platform control box or communication cable from base to platform	EC01 on control board indicates faulty control box or damaged communication cable. Inspect wiring in control box and communication cable. Repair as necessary
	Faulty upper control board	Replace platform control box

PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Right rear outrigger does not extend or right rear outrigger does not retract	Faulty outrigger valve coil or wiring	EC23 on control board indicates faulty coil on extend valve of RR outrigger or faulty wiring. EC24 on control board indicates faulty coil on retract valve of RR outrigger or faulty wiring. Replace appropriate coil and/or repair wiring
	Faulty outrigger valve	Replace appropriate valve on RR outrigger
	Faulty outrigger cylinder	Replace cylinder on RR outrigger
	Faulty outrigger switch	Replace RR outrigger switch
	Faulty upper control board	Replace platform control box
	Faulty lower control board	Replace lower control board
Outriggers do not extend or outriggers do not retract	Faulty coil on outrigger valve or wiring	EC25 on control board indicates faulty extend coil on outrigger valve or faulty wiring. EC26 on control board indicates faulty retract coil on outrigger valve. Replace appropriate coil and/or repair wiring
	Faulty main outrigger valve	Replace main outrigger valve
	Faulty outrigger deadman switch	Replace outrigger deadman switch
Left front outrigger does not extend or left	Faulty lower control board	Replace lower control board
does not extend or left front outrigger does not retract	Faulty outrigger valve coil or wiring	EC17 on control board indicates faulty coil on extend valve of LF outrigger or faulty wiring. EC18 on control board indicates faulty coil on retract valve of LF outrigger or faulty wiring. Replace appropriate coil and/or repair wiring
	Faulty outrigger valve	Replace appropriate valve on LF outrigger
	Faulty outrigger cylinder	Replace cylinder on LF outrigger
	Faulty outrigger switch	Replace LF outrigger switch
	Faulty upper control board	Replace platform control box
	Faulty lower control board	Replace lower control board
Left rear outrigger does not extend or left rear outrigger does not retract	Faulty outrigger valve coil or wiring	EC19 on control board indicates faulty coil on extend valve of LR outrigger or faulty wiring. EC20 on control board indicates faulty coil on retract valve of LR outrigger or faulty wiring. Replace appropriate coil and/or repair wiring

PROBLEM	PROBABLE CAUSE	REMEDY/SOLUTION
Left rear outrigger does not extend or left rear outrigger does not retract (continued)	Faulty outrigger valve	Replace appropriate valve on LR outrigger
	Faulty outrigger cylinder	Replace cylinder on LR outrigger
	Faulty outrigger switch	Replace LR outrigger switch
	Faulty upper control board	Replace platform control box
	Faulty lower control board	Replace lower control board
	Faulty outrigger valve coil or wiring	EC21 on control board indicates faulty coil on extend valve of RF outrigger or faulty wiring. EC22 on control board indicates faulty coil on retract valve of RF outrigger or faulty wiring. Replace appropriate coil and/or repair wiring
Right front outrigger does not extend or right front outrigger does not retract	Faulty outrigger valve	Replace appropriate valve on RF outrigger
	Faulty outrigger cylinder	Replace cylinder on RF outrigger
	Faulty outrigger switch	Replace RF outrigger switch
	Faulty upper control board	Replace platform control box
	Faulty lower control board	Replace lower control board

9586 DECAL, CNTRL BOARD ERROR CODES

EC01 - DATA LINE PROBLEM OR PROBLEM AT PLATFORM
EC02 - BAD CONNECTION AT JOYSTICK
EC03 - SHORT OR OPEN CONNECTION AT STARTER RELAY
EC04 - SHORT OR OPEN CONNECTION AT CHOKE/GLOW PLUG
EC05 - SHORT OR OPEN CONNECTION AT LIFT UP
EC06 - SHORT OR OPEN CONNECTION AT LIFT DOWN
EC07 - SHORT OR OPEN CONNECTION AT STEERING BRAKE
EC08 - SHORT OR OPEN CONNECTION AT TORQUE
EC09 - SHORT OR OPEN CONNECTION AT MOVEMENT ALARM
EC10 - SHORT OR OPEN CONNECTION AT HORN
EC11 - SHORT OR OPEN CONNECTION AT BRAKE VALVE
EC12 - SHORT OR OPEN CONNECTION AT STEER RIGHT
EC13 - SHORT OR OPEN CONNECTION AT STEER LEFT
EC14 - SHORT OR OPEN CONNECTION AT DRIVE FORWARD
EC15 - SHORT OR OPEN CONNECTION AT DRIVE REVERSE
EC16 - SHORT OR OPEN CONNECTION AT BYPASS
EC17 - SHORT OR OPEN CONNECTION AT OUTRIGGER LEFT FRONT EXTEND
EC18 - SHORT OR OPEN CONNECTION AT OUTRIGGER LEFT FRONT RETRACT
EC19 - SHORT OR OPEN CONNECTION AT OUTRIGGER LEFT REAR EXTEND
EC20 - SHORT OR OPEN CONNECTION AT OUTRIGGER LEFT REAR RETRACT
EC21 - SHORT OR OPEN CONNECTION AT OUTRIGGER RIGHT FRONT EXTEND
EC22 - SHORT OR OPEN CONNECTION AT OUTRIGGER RIGHT FRONT RETRACT
EC23 - SHORT OR OPEN CONNECTION AT OUTRIGGER RIGHT REAR EXTEND
EC24 - SHORT OR OPEN CONNECTION AT OUTRIGGER RIGHT REAR RETRACT
EC25 - SHORT OR OPEN CONNECTION AT EXTEND OUTRIGGERS
EC26 - SHORT OR OPEN CONNECTION AT RETRACT OUTRIGGERS
EC27 - SHORT OR OPEN CONNECTION AT THROTTLE HOLD
EC28 - SHORT OR OPEN CONNECTION AT THROTTLE PULL
C29 - SHORT OR OPEN CONNECTION AT DIESEL HOLD
C30 - SHORT OR OPEN CONNECTION AT DIESEL PULL
EC31 - OIL OR TEMPERATURE SWITCH IS ON

EC32-SHORT OR OPEN CIRCUIT AT PRESSURE REDUCING VALUE 4191 ONLY EC33 SMORT OR OPEN CIRCUIT AT AXLE LOCKING CYLINDER 4191 ONLY

TABLE OF CONTENTS PARTS MANUAL

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SECTION 2: Platform and Rails

SECTION 3: Scissors

SECTION 4: Axles

SECTION 5: Hydraulics

SECTION 6: Base

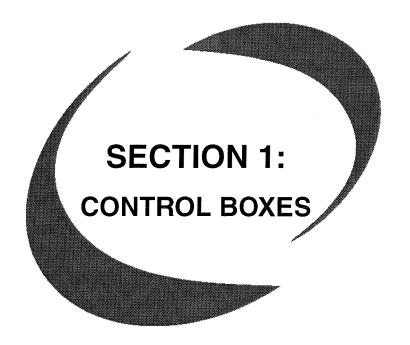
SECTION 7: Decals

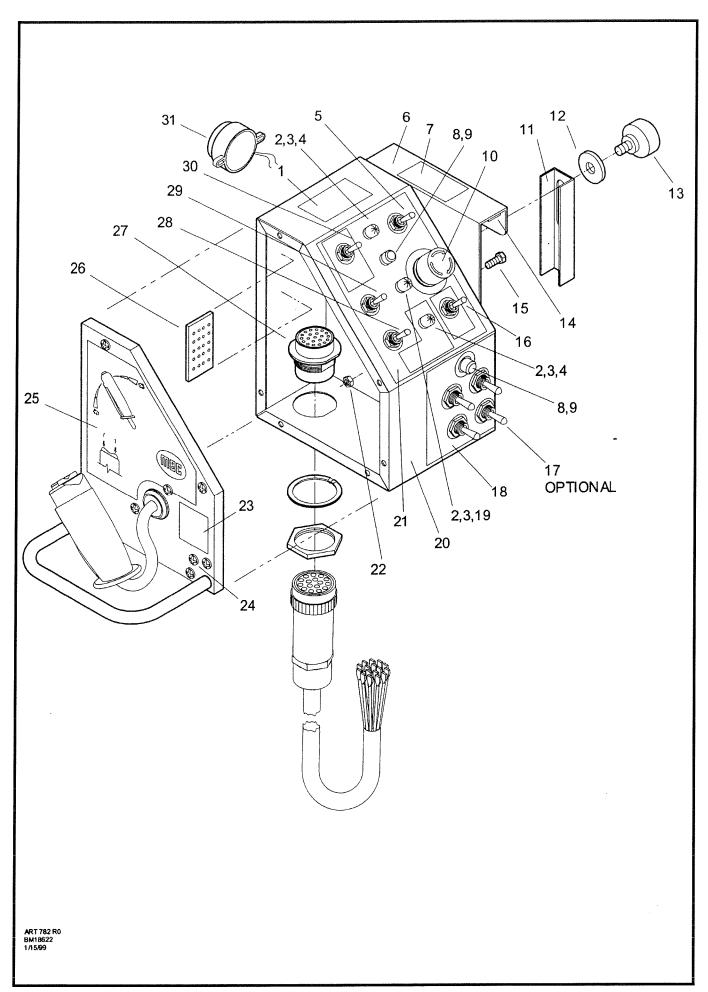
SECTION 8: Options

APPENDIX: Hydraulic Schematics

Electrical Schematics

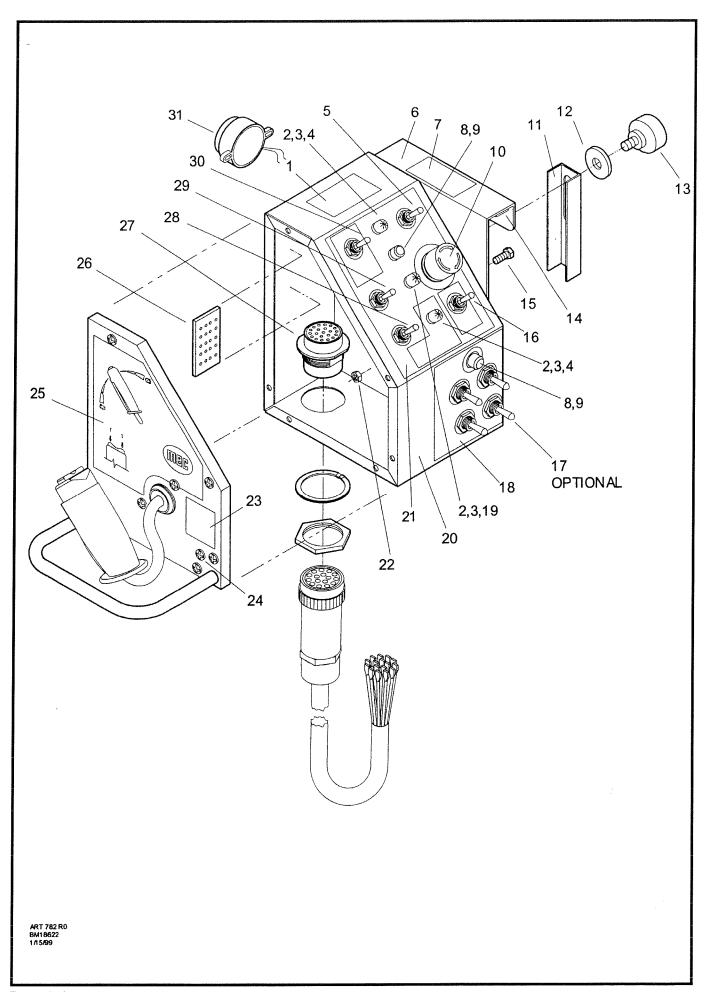
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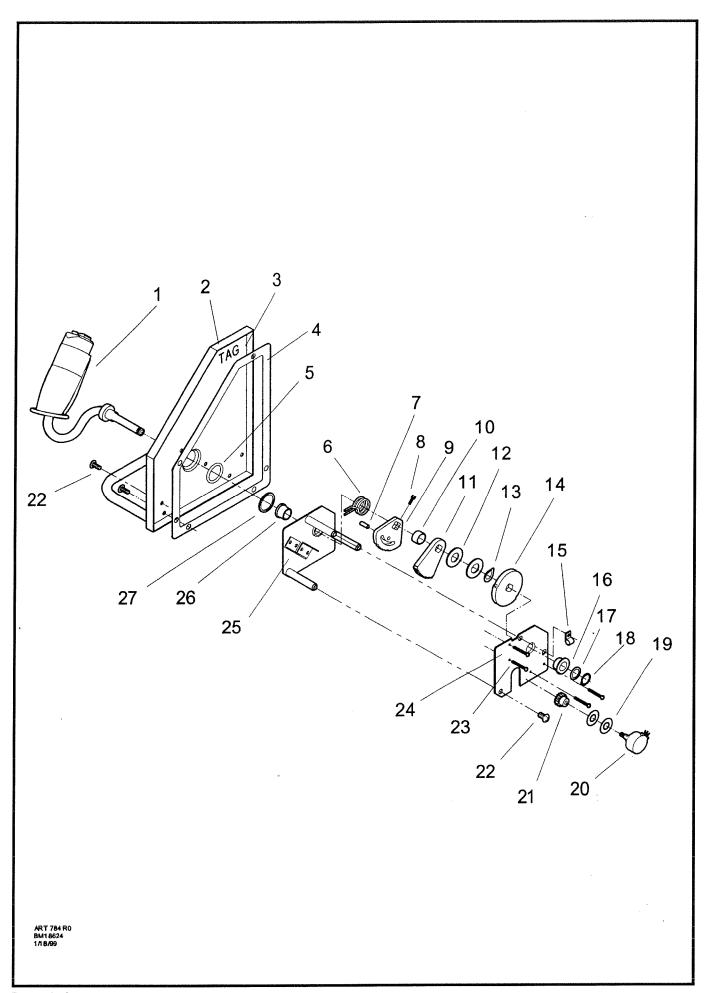
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ITEM	PART NO.	QTY	DESCRIPTION
	20782		CNTRL BOX ASSY - WITHOUT OUTRIGGERS - DIESEL
	20784		CNTRL BOX ASSY - WITH OUTRIGGERS - DIESEL
	20786		CNTRL BOX ASSY - WITHOUT OUTRIGGERS - TKD
	20783		CNTRL BOX ASSY - WITHOUT OUTRIGGERS - DUAL FUEL
	20785		CNTRL BOX ASSY - WITH OUTRIGGERS - DUAL FUEL
	20787	APPLICATION OF THE PROPERTY OF	CNTRL BOX ASSY - WITH OUTRIGGERS - TKD
1	7827	1	DECAL, WARNING LIGHT
2	9179	3	LIGHT SOCKET
3	9188	3	LIGHT, BAYONET, 14 VOLT
4	9184	2	LENS, YELLOW
5	5630	1	SWITCH, TOGGLE, 2 POSITION, MAINTAINED
6	13865	1	BRACKET, CONTROL BOX, HOLDER
7	7156	1	DECAL, FRONT
8	8044	2	SWITCH
9	8819	2	SWITCH COVER
10	7800	1	SWITCH, STOP, ASSY
11	13864	1	BRACKET, CONTROL BOX, LOCK
12	HDW8294	1	WASHER, FLAT
13	8826	2	THUMBSCREW, 5/16" -18, FLOWER
14	6350	.5FT	TAPE, FOAM
15	HDW5724	1	SCREW, 5/16" - 18, 3/4" LG
16	6905	1	SWITCH, TOGGLE, 3 POS, MAINTAINED, CENTER OFF
17	5230	4	SWITCH, TOGGLE, 3 POS, MOMENTARY, CENTER OFF
18	9470	1	DECAL, OUTRIGGERS
19	9183	2	LIGHT LENS, RED
20	20597	1	WRAPPER, CONTROL BOX WELDMENT
21	9468 OR	1	DECAL, CONTROL BOX
	9541	1	DECAL, CONTROL BOX-DIESEL
22	HDW7120	1	NUT, 5/16"-18
23	9479	1	DECAL, CONTROL BOX ID
24	HDW7888	12	SCREW, #10-32,1/2" LG
25	8635	1	DECAL, DIRECTIONS, JOYSTICK
			CONT'D

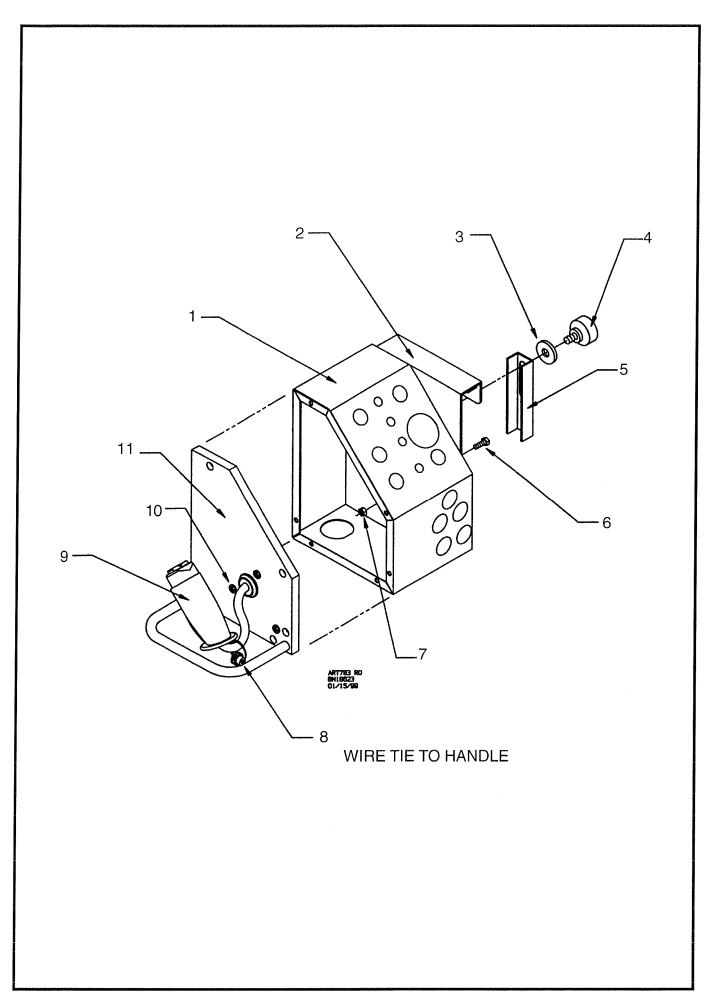


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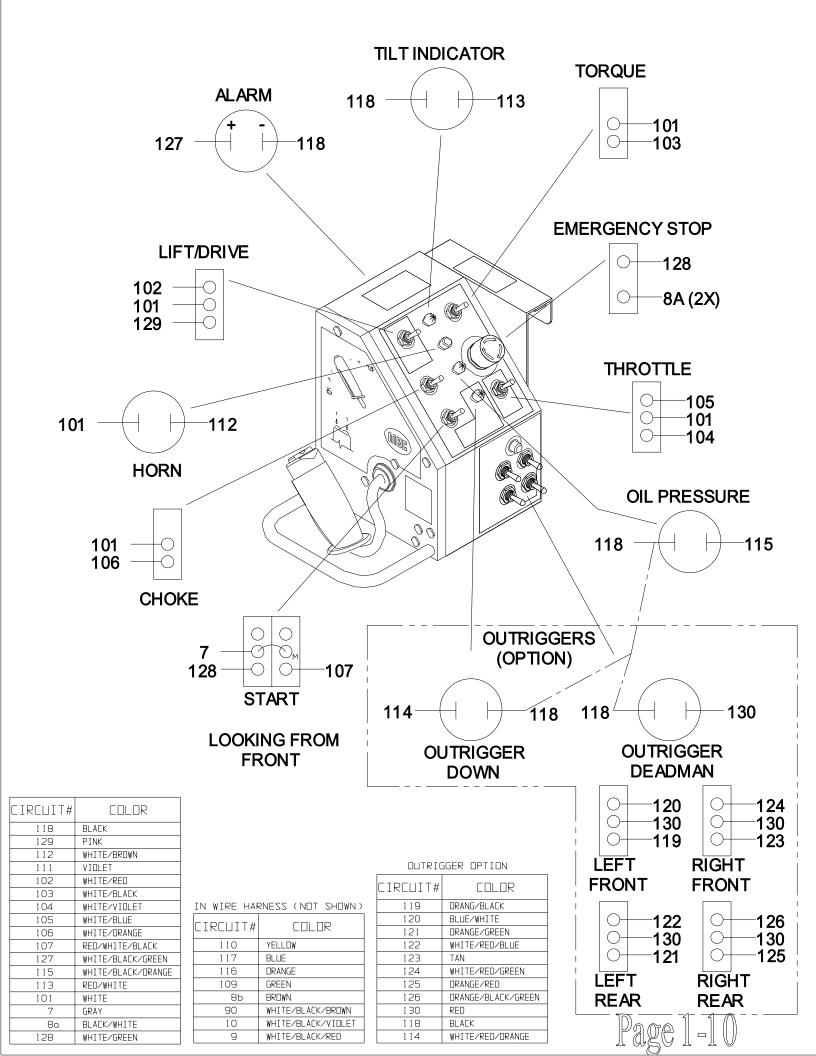
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1 1 1-141	I AITI NO.	Q 1 1	CONT'D
26	9499	1	CIRCUIT BOARD, CONTROL BOX
27	9429	1	WIRE HARNESS, CONTROL BOX
28	9478	1	SWITCH, 3 POS, #1 & #2 MAINTAINED, #3 MOMENTARY
29	7423	1	SWITCH, TOGGLE, 2 POSITION, MOMENTARY
30	6234	1	SWITCH, TOGGLE, 2 POSITION, MAINTAINED
31	9173	1	BUZZER, 10-48 VOLT
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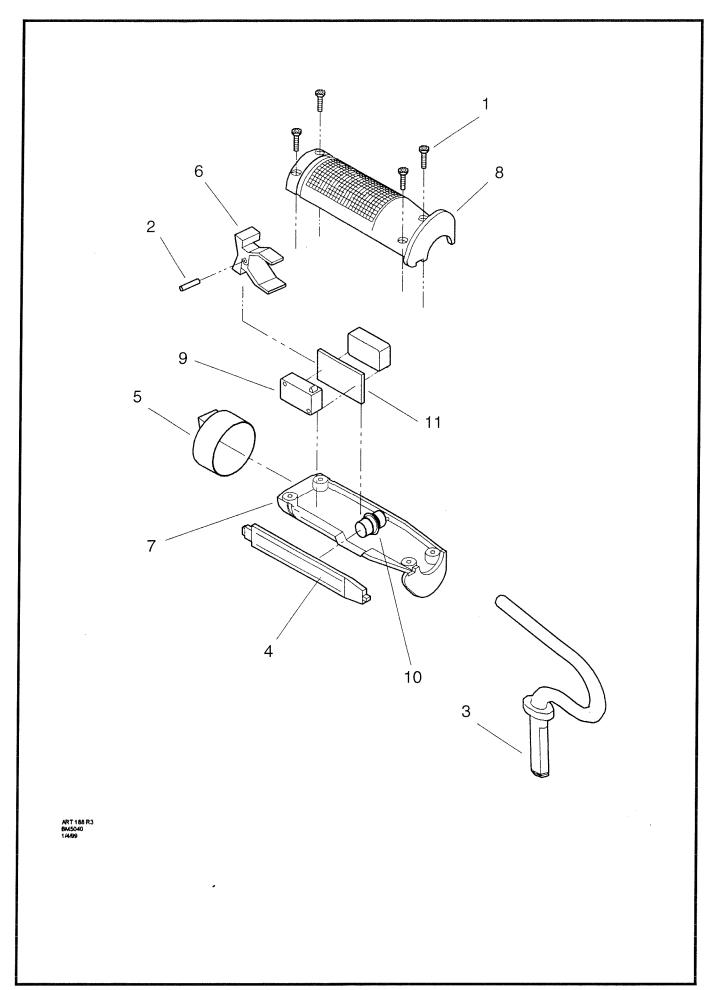
ITEM	PART NO.	QTY	DESCRIPTION
1	13647	1	CONTROL ARM ASSY
2	3772	1	COVER WELDMENT, JOYSTICK
3	8066	1	TAG, INSPECTION
4	7875	1	GASKET, JOYSTICK
5	7882	1	O-RING, 7/8" ID X 11/8" OD
6	8435	1	SPRING, TORSION
7	100/8348	1	PIN, HOLD DOWN
8	HDW7887	1	SCREW, #6-32,1/2" LG
9	13502	1	BRACKET, CENTERING-JOYSTICK
10	3763	1	SPACER, STEP-JOYSTICK
11	13402	1	GEAR, LARGE
12	HDW8531	2	WASHER
13	HDW7881	1	WASHER, SPECIAL
14	3782	1	CAM, DIRECTIONAL
15	6917	1	CLAMP, CABLE 1/4"
16	7818	6	BEARING, BRONZE, FLANGED
17	HDW3771	1	WASHER
18	5736	1	RETAINING RING, 1/2"
19	HDW8567	2	WASHER
20	10977	1	POTENTIOMETER ASSY
21	8389	1	GEAR, SPUR
22	HDW7888	6	SCREW, #10-32,1/2" LG
23	HDW8399	4	SCREW, #4-40, 5/8" LG
24	13403	1	PLATE, BOTTOM - CONTROL BOX
25	3766	1	PLATE, TOP - JOYSTICK
26	7819	1	BEARING, BRONZE, FLANGED
27	HDW3768	1	WASHER
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ITEM	PART NO. 20876	QTY	DESCRIPTION CONTROL BOX ASSY
1	20597	1	WRAPPER, CONTROL BOX WELDMENT
	13865	1	BRACKET, CONTROL BOX HOLDER
2			FLAT WASHER
3	HDW8294	1	
4	8826	1	SCREW, 5/16-18, FLOWER THUMB
5	13864	1	BRACKET, CONTROL BOX LOCK
6	HDW5724	1	SCREW, 5/16-18, 3/4" LG
7	HDW7120	1	NUT, 5/16-18, LOCK
8	8389	1	GEAR, SPUR
9	13647	1	CONTROL ARM ASSY
10	HDW7888	3	SCREW, #10-32, 1/2" LG
11	3772	1	COVER WELDMENT, JOYSTICK
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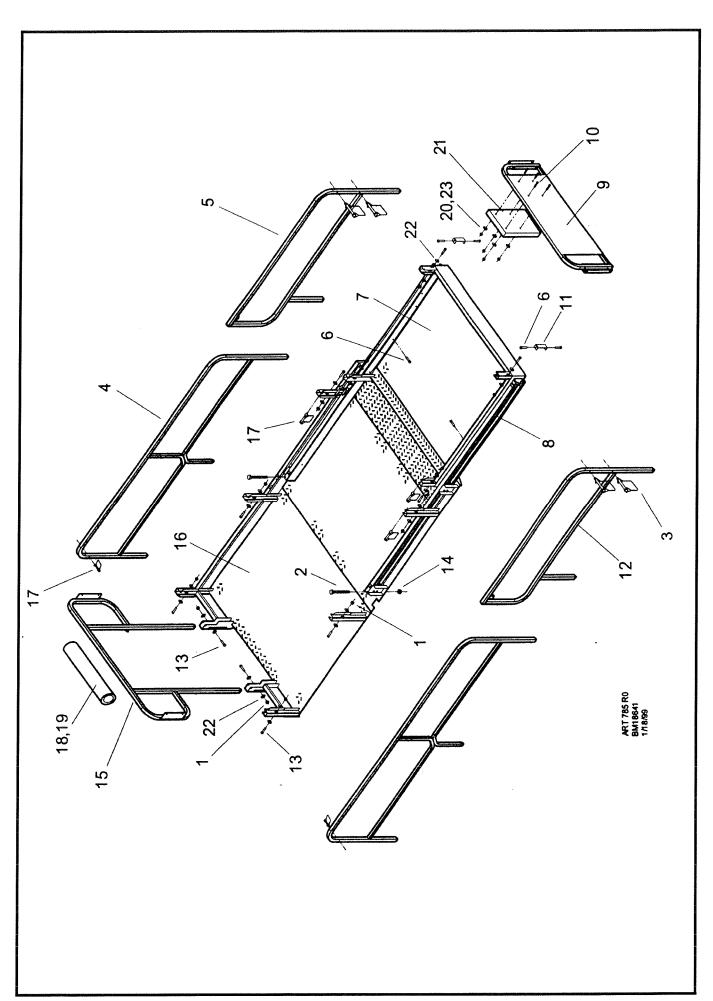


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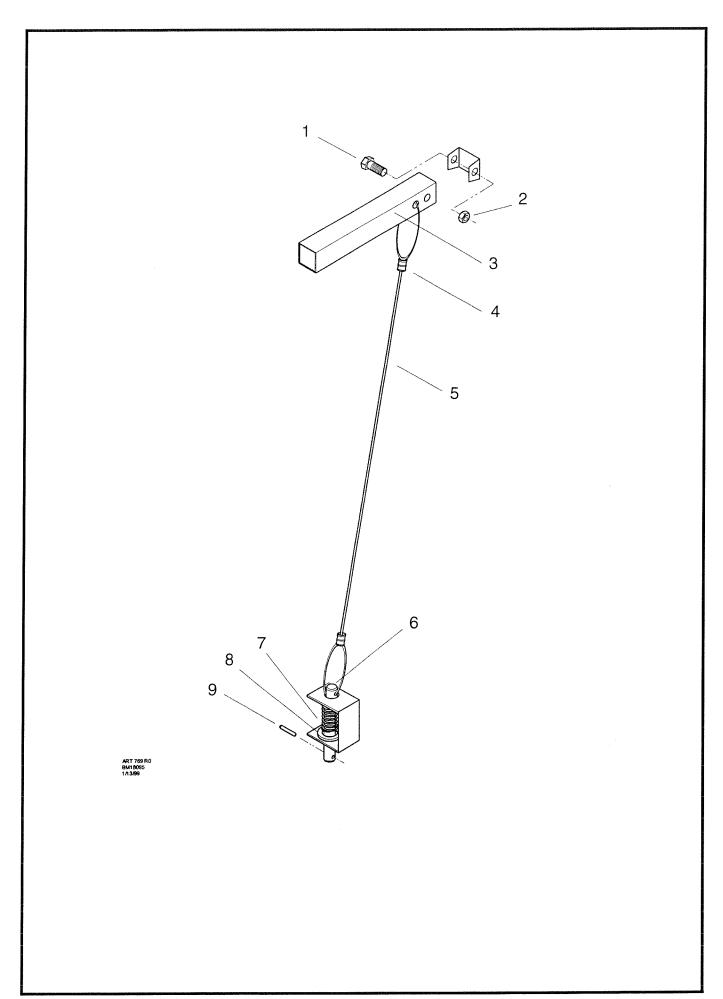


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ITEM	PART NO.	QTY	
	13647 90266	194	CONTROL ASSY, JOYSTICK
1	HDW8455	4	SCREW, 6 X 1/2 TAPTITE
2	8750	1	PIN
3	13638	1	CONTROL ARM WITHOUT WIRE
4	8748	1	TRIGGER
5	8456	1	ROCKER BOOT
6	8453	1	SWITCH ACTUATOR
7	8751	1	GRIP - BOTTOM HALF
8	8752	1	GRIP-TOP HALF
	8761	1	SWITCH ASSY (NOT SHOWN)
9	8448	2	SWITCH-V3
10	8753	1	MOTION SWITCH, ON-OFF
11	8447	1	SWITCH SEPARATOR
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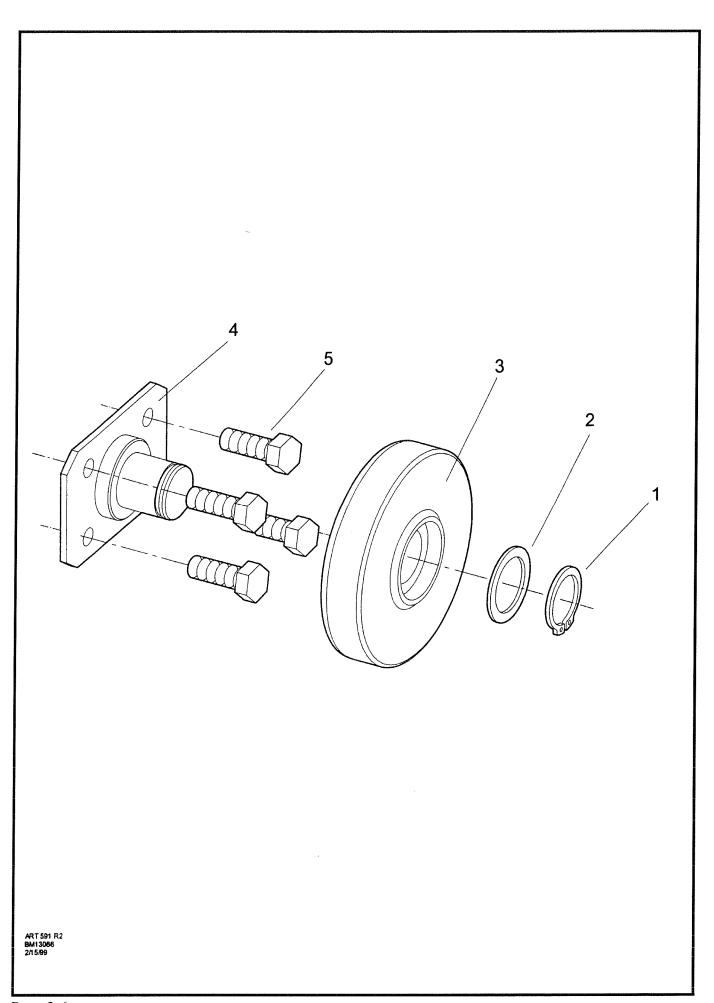




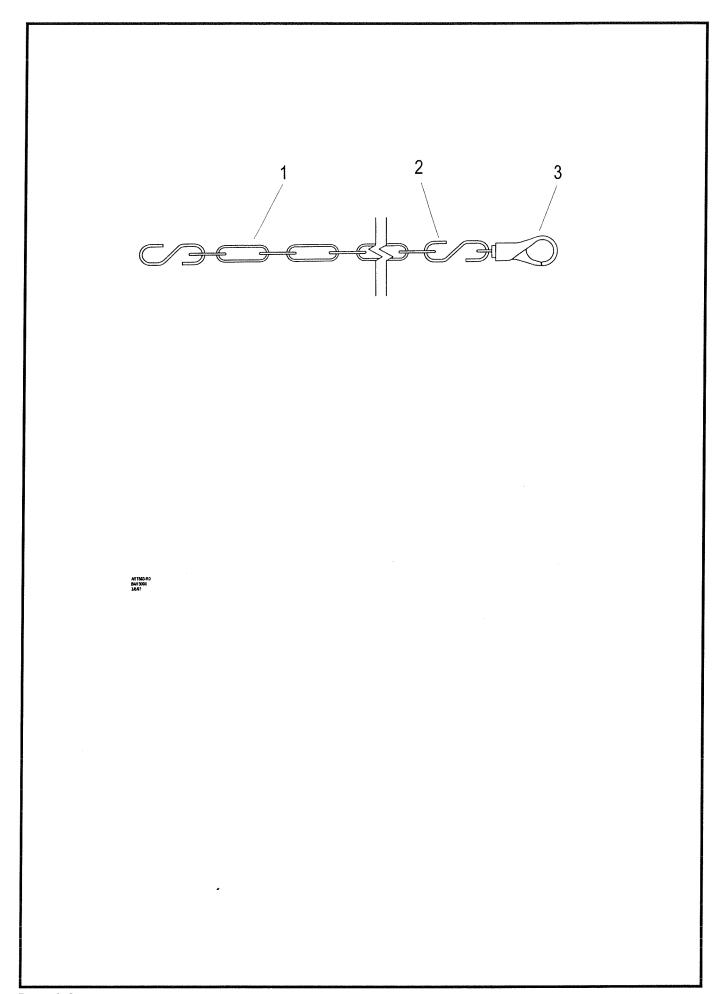
ITEM	PART NO.	QTY	DESCRIPTION
1	HDW8304	12	NUT, 5/16"-18
2	HDW8856	2	SCREW, 1/2"-13, 5" LG
3	HDW8974	4	WIRE LOCK PIN, SQUARE, 3/8" X 3" LG
4	20116	2	SIDE RAIL WELDMENT-MAIN PLATFORM
5	14301	1	SIDE RAIL WELDMENT-EXTENSION PLATFORM
6	HDW5724	20	SCREW, 5/16"-18, 3/4" LG, GR 5
7	20157	1_	EXTENSION PLATFORM WELDMENT
8	14152	2	EXTENSION CHANNEL
9	20136	1	FRONT RAIL WELDMENT-EXTENSION
10	HDW6455	4	SCREW, 1/4"-20, 1/2" LG
11	14415	2	EXTENSION STOP BRACKET
12	14313	1	RIGHT SIDE RAIL WELDMENT-EXTENSION PLATFORM
13	HDW7I 19	12	SCREW, 5/16"-18, 2 1/4" LG, GR 5
14	HDW8457	2	NUT, 1/2"-13
15	20168	1	REAR RAIL WELDMENT-MAIN PLATFORM
16	20139	1	MAIN PLATFORM WELDMENT
17	HDW7593	6	WIRE LOCK PIN, SQUARE, 3/8" X 2 1/4" LG
18	7805	1	RAIL PAD
19	7048	1	RAIL PAD COVER
20	HDW6461	4	NUT, 1/4"-20
21	8909	1	MANUAL ENCLOSURE
22	HDW5217	24	FLAT WASHER
23	HDW8294	4	FLAT WASHER
	8844	2	GROMMET, CORD PROTECTOR-PLATFORM (NOT SHOWN)
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ITEM 1	PART NO. HDW8486	QTY 1	DESCRIPTION SCREW, 5/16"-18, 1 7/8" LG
2	HDW8304	1	LOCKNUT, 5/16"-18
3	20235	1	HANDLE - ROLLOUT PLATFORM
4	8814	2	
	7184	+	SLEEVES, ALUMINUM OVAL
5		4 FT	CABLE, COATED & ROLLED
6	13737	1	PIN, EXTENSION LOCK
7	7408	1	SPRING, DECK LOCK
8	HDW7031	1	WASHER, FLAT, 1/2" ID 7/8" OD
9	8513	1	PIN, SPRING, 1/8" DIA. 3/4" LG
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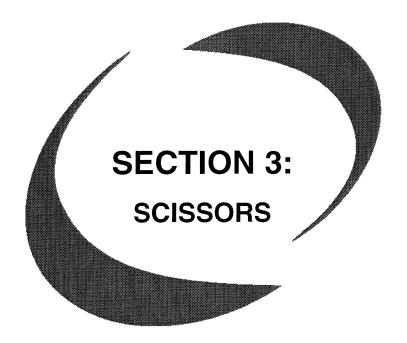


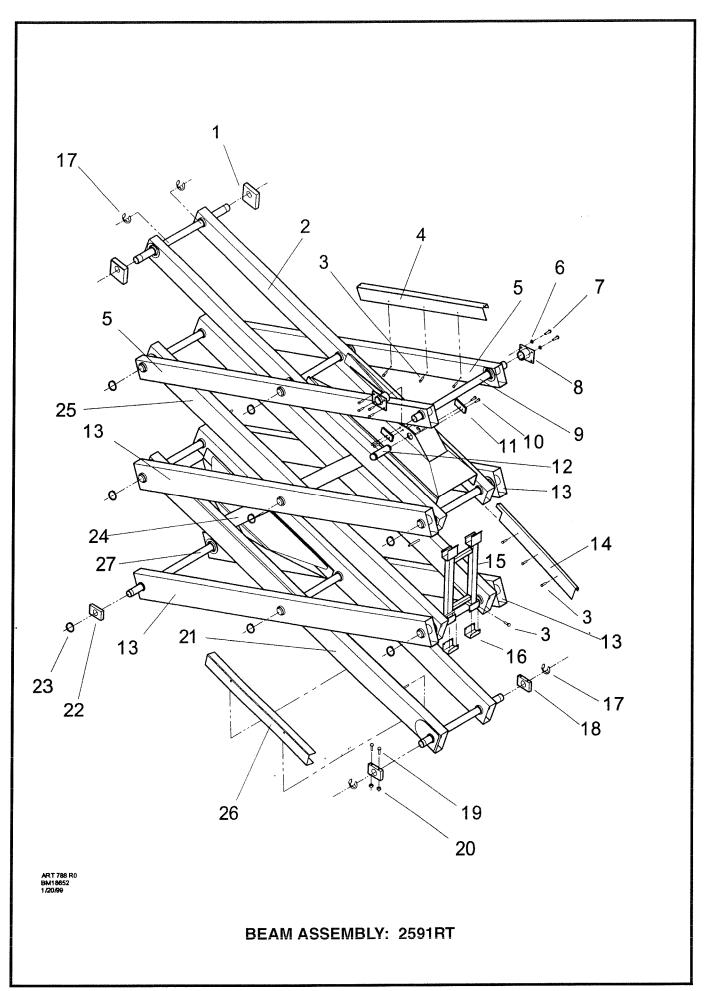
ITEM	PART NO.	QTY	DESCRIPTION
1	5918	1	RETAINING RING, HEAVY DUTY 1"
2	HDW8370	1	FLAT WASHER
3	13230	1	ROLLER
4	14062	1	ROLLER PLATE WELDMENT
5	HDW5724	4	SCREW, 5/16"-18, 3/4" LG
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ITEM	PART NO.	QTY	DESCRIPTION
11 - 101	13850	QII	CHAIN CLOSURE
1	13846	1	GUARD CHAIN
2	5239	2	CONNECTING LINK, S-HOOK
3	8781	1	CHAIN LINK SNAP
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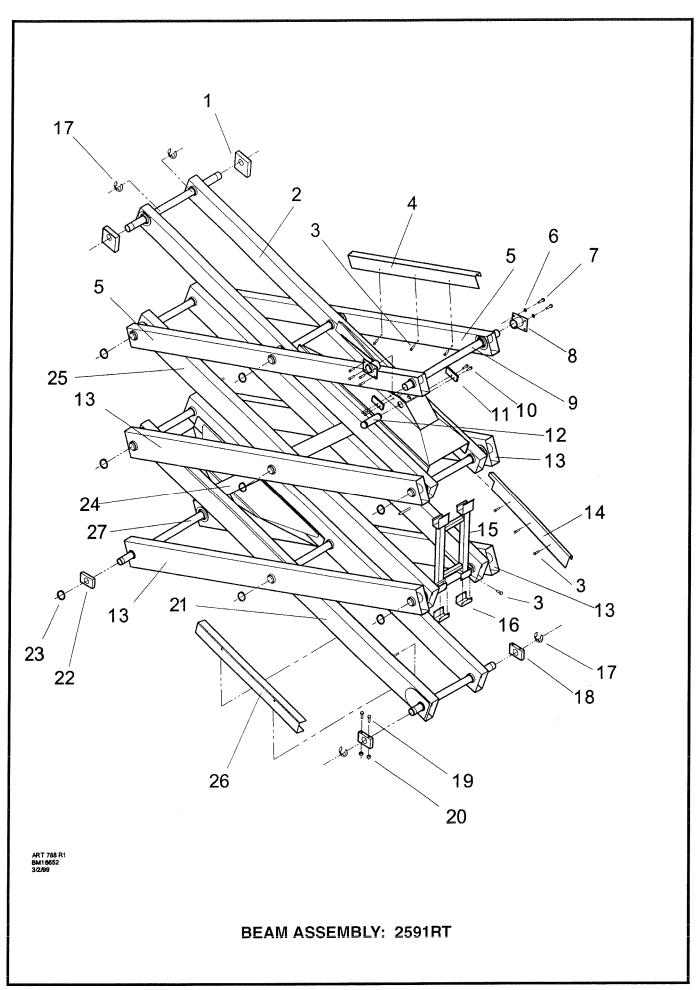
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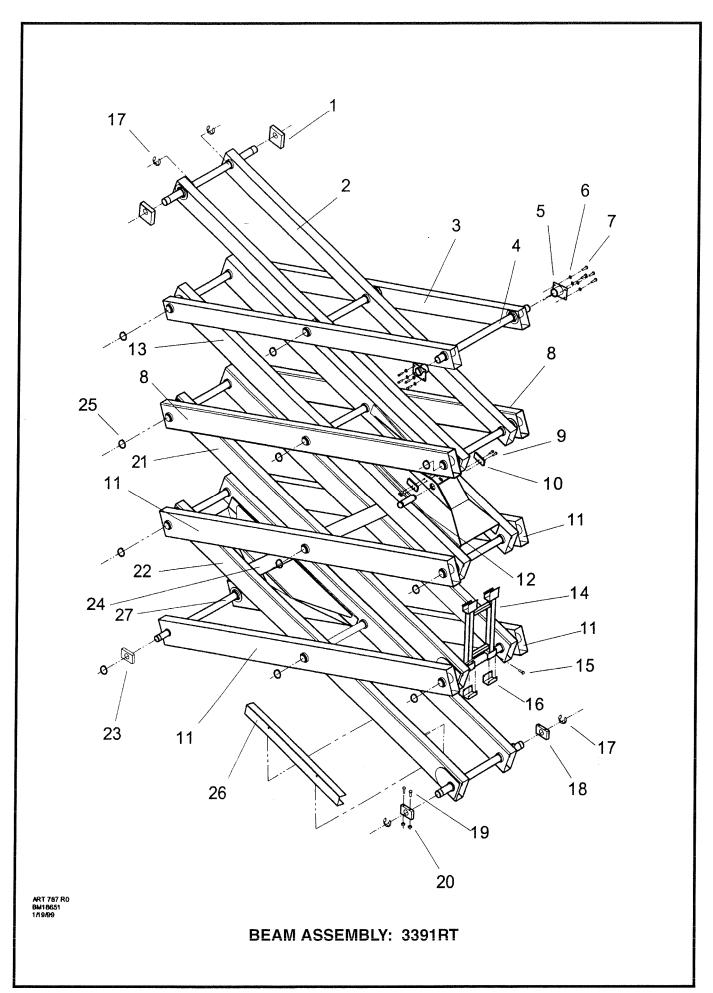
Page 3-2

ITEM	PART NO.	QTY	DESCRIPTION
1	20141	2	BLOCK, SLIDE - PLATFORM
2	20870	1	BEAM, SINGLE CYLINDER MOUNT
3	HDW6455	14	SCREW, 1/4" - 20,1/2" LG
4	20913	1	GUARD, CONTROL CORD, SHORT
5	20873	2	BEAM WELDMENT, 3" X 6"
	6669	6	BEARING
6	HDW7783	8	WASHER, SPLIT, LOCK, 3/8"
7	HDW8277	8	SCREW, 3/8" - 16, 1 3/4" LG
8	20365	2	SCISSORS MOUNT ASSEMBLY
	6669	2	BEARING
9	8340	1	PIN, ROLLER - PLATFORM
10	HDW5723	8	SCREW, 1/4" - 20, 3/4" LG
11	10015	4	PLATE, CYLINDER PIN LOCK
12	20224	2	PIN, CYLINDER
13	10020	4	BEAM, OUTER, 3" X 8"
	6669	6	BEARING
14	20839	1	GUARD, CONTROL CORD
15	20778	1	LOCK, MAINTENANCE
16	3219	2	BRACKET, MAINTENANCE LOCK
17	6688	4	CLIP RING, 2" SHAFT
18	20429	2	BLOCK, FIXED - BASE
19	HDW8856	4	SCREW, 1/2" -13, 5" LG
20	HDW6463	4	NUT, 1/2" - 13, NYLON
21	20868	1	BEAM, SINGLE CYLINDER MOUNT
22	20142	2	BLOCK, SLIDE - BASE
23	6701	16	RING, RETAINING, 2" SHAFT
24	9276	1	CYLINDER, LIFT
25	10027	1	BEAM, INNER, CENTER
26	20663	1	HOSE TRAY
27	20413	1	PIN-SLIDE, BASE
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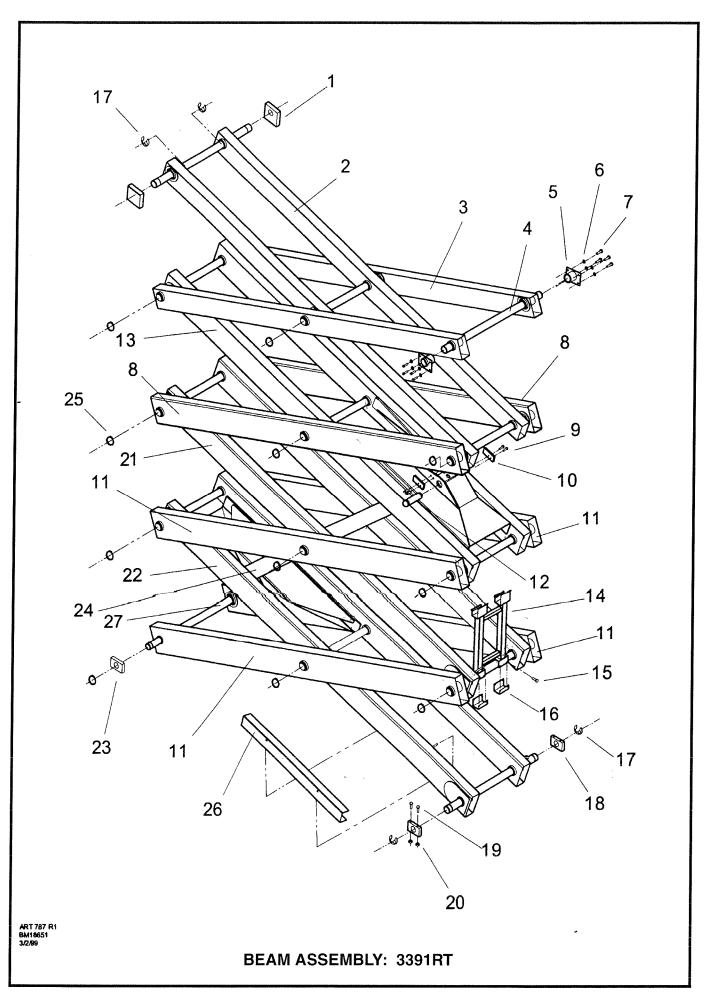


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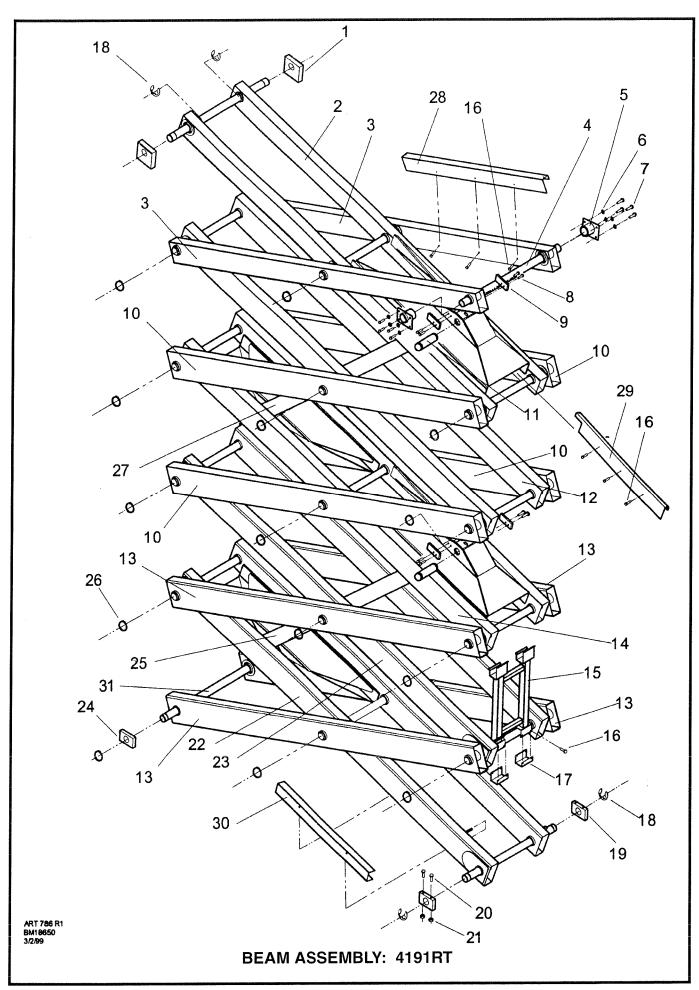
ITEM	PART NO.	QTY	DESCRIPTION
1	20141	2	BLOCK, SLIDE - PLATFORM
2	20949	1	BEAM, SINGLE CYLINDER MOUNT
3	HDW6455	14	SCREW, 1/4"-20, 1/2" LG
4	20913	1	GUARD, CONTROL CORD, SHORT
5	20948	2	BEAM WELDMENT 3" X 6"
	6669	6	BEARING
6	HDW7783	8	WASHER, SPLIT, LOCK, 3/8"
7	HDW8277	8	SCREW, 3/8" - 16,1 3/4" LG
8	20365	2	SCISSORS MOUNT ASSEMBLY
	6669	2	BEARING
9	8340	1	PIN, ROLLER - PLATFORM
10	HDW5723	8	SCREW, 1/4" - 20, 3/4" LG
11	10015	4	PLATE, CYLINDER PIN LOCK
12	20224	2	PIN, CYLINDER
13	20938	4	BEAM, OUTER, 3" X 8"
	6669	6	BEARING
14	20839	1	GUARD, CONTROL CORD
15	20778	1	LOCK, MAINTENANCE
16	3219	2	BRACKET, MAINTENANCE LOCK
17	6688	4	CLIP RING, 2" SHAFT
18	20429	2	BLOCK, FIXED - BASE
.19	HDW8856	4	SCREW, 1/2" -13, 5" LG
20	HDW6463	4	NUT,1/2"-13, NYLON
21	20947	1	BEAM, SINGLE CYLINDER MOUNT
22	20142	2	BLOCK, SLIDE - BASE
23	6701	16	RING, RETAINING, 2" SHAFT
24	9276	1	CYLINDER, LIFT
25	20934	1	BEAM, INNER, CENTER
26	20663	1	HOSE TRAY
27	20413	1	PIN-SLIDE, BASE



ITEM	PART NO.	QTY	DESCRIPTION
1	20141	2	BLOCK, SLIDE - PLATFORM
2	20774	1	BEAM, INNER
3	10021	2	BEAM, OUTER, 3" X 6"
	6669	6	BEARING
4	8340	1	PIN, ROLLER - PLATFORM
5	20365	2	SCISSORS MOUNT ASSEMBLY
	6669	2	BEARING
6	HDW7783	8	WASHER, SPLIT, LOCK, 3/8"
7	HDW8277	8	SCREW, 3/8" - 16, 1 3/4" LG
8	20213	2	BEAM WELDMENT
	6669	6	BEARING
9	HDW5723	8	SCREW, 1/4" - 20, 3/4" LG
10	10015	4	PLATE, CYLINDER PIN LOCK
11	10020	4	BEAM, OUTER, 3" X 8"
	6669	6	BEARING -
12	20224	2	PIN, CYLINDER
13	20877	1	BEAM, INNER, CYLINDER MOUNT
14	20778	1	LOCK, MAINTENANCE
15	HDW6455	4	SCREW, 1/4" -20,1/2" LG
16	3219	2	BRACKET, MAINTENANCE LOCK
17	6688	4	CLIP RING, 2" SHAFT
18	20429	2	BLOCK, FIXED - BASE
19	HDW8856	4	SCREW, 1/2" - 13, 5" LG
20	HDW6463	4	NUT, 1/2"- 13, NYLON
21	10027	1	BEAM, INNER, CENTER
22	20868	1	BEAM, SINGLE CYLINDER MOUNT
23	20142	2	BLOCK, SLIDE - BASE
24	9276	1	CYLINDER, LIFT
25	6701	22	RING, RETAINING, 2" SHAFT
26	20663	1	HOSE TRAY
27	20413	1	PIN, SLIDE, BASE

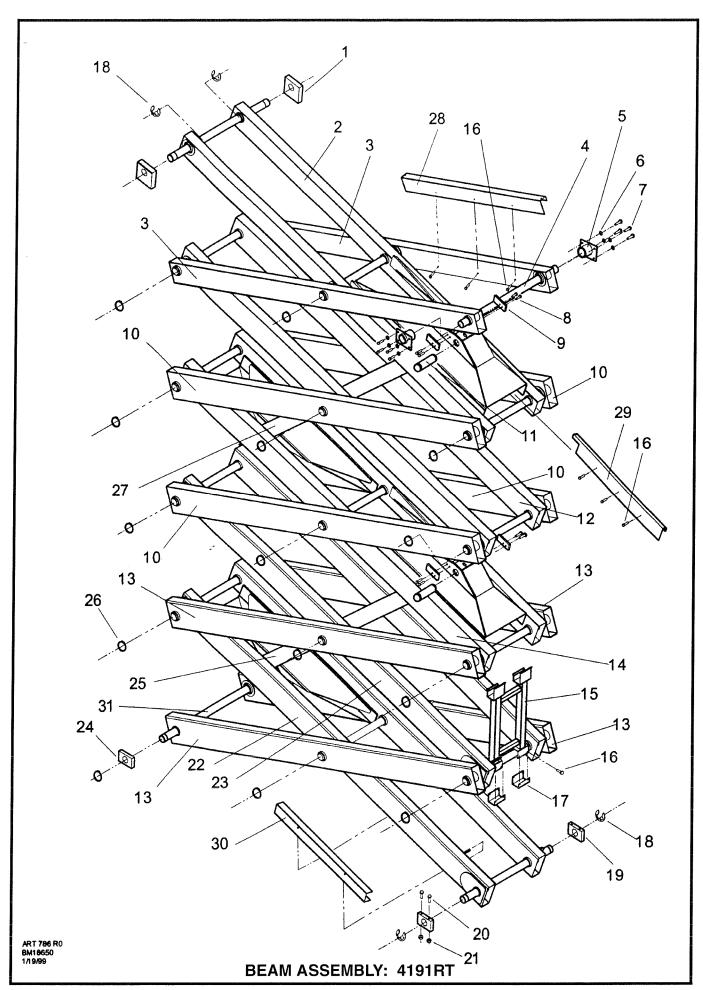


ITEM	PART NO.	QTY	DESCRIPTION	
1	20141	2	BLOCK, SLIDE - PLATFORM	
2	20957	1	BEAM, INNER	
3	20939	2	BEAM, OUTER, 3" X 6"	
	6669	6	BEARING	
4	8340	1	PIN, ROLLER - PLATFORM	
5	20365	2	SCISSORS MOUNT ASSEMBLY	
	6669	2	BEARING	
6	HDW7783	8	WASHER, SPLIT, LOCK, 3/8"	
7	HDW8277	8	SCREW, 3/8"-16,1 3/4" LG	
8	20932	2	BEAM WELDMENT	
	6669	6	BEARING	
9	HDW5723	8	SCREW, 1/4"-20, 3/4" LG	
10	10015	4	PLATE, CYLINDER PIN LOCK	
11	20938	4	BEAM, OUTER, 3" X 8"	
	6669	6	BEARING	
12	20224	2	PIN, CYLINDER	
13	20956	1	BEAM, INNER, CYLINDER MOUNT	
14	20778	1	LOCK, MAINTENANCE	
15	HDW6455	4	SCREW, 1/4"- 20, 1/2" LG	
16	3219	2	BRACKET, MAINTENANCE LOCK	
17	6688	4	CLIP RING, 2" SHAFT	
18	20429	2	BLOCK, FIXED - BASE	
19	HDW8856	4	SCREW, 1/2" - 13, 5" LG	
20	HDW6463	4	NUT, 1/2" - 13, NYLON	
21	20934	1	BEAM, INNER, CENTER	
22	20947	1	BEAM, SINGLE CYLINDER MOUNT	
23	20142	2	BLOCK, SLIDE - BASE	
24	9276	1	CYLINDER, LIFT	
25	6701	22	RING, RETAINING, 2" SHAFT	
26	20663	1	HOSE TRAY	
27	20413	1	PIN, SLIDE, BASE	



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ITEM	PART NO.	QTY	DESCRIPTION			
1	20141	2	BLOCK, SLIDE - PLATFORM			
2	20935	1	BEAM, 3/16", SINGLE CYLINDER MOUNT			
3	20939	2	BEAM, OUTER, 3" X 6"			
	6669	6	BEARING			
4	8340	1	PIN, ROLLER - PLATFORM			
5	20365	2	SCISSORS MOUNT ASSEMBLY			
_	6669	2	BEARING			
6	HDW7783	8	WASHER, SPLIT, LOCK, 3/8"			
7	HDW8277	8	SCREW, 3/8" - 16, 1 3/4" LG			
8	HDW5723	16	SCREW, 1/4" - 20, 3/4" LG			
9	w	8	PLATE, CYLINDER PIN LOCK			
10	20938	4	BEAM, OUTER, 3" X 8"			
	6669	6	BEARING			
11	20224	4	PIN, CYLINDER			
12	20934	1	BEAM, INNER, CENTER			
13	20932	4	BEAM WELDMENT			
7	6669	6	BEARING			
14	20933	1	BEAM, DOUBLE CYLINDER MOUNT			
15	20778	1	LOCK, MAINTENANCE			
16	HDW6455	14	SCREW, 1/4" - 20, 1/2" LG			
17	3219	2	BRACKET, MAINTENANCE LOCK			
18	6688	4	CLIP RING, 2" SHAFT			
19	20429	2	BLOCK, FIXED - BASE			
20	HDW8856	4	SCREW, 1/2" - 13, 5" LG			
21	HDW6463	4	NUT, 1/2" - 13, NYLON			
22	20927	1	BEAM, 1/4", SINGLE CYLINDER MOUNT			
23	20937	1	BEAM WELDMENT			
24	20142	2	BLOCK, SLIDE - BASE			
25	9276	1	CYLINDER, LIFT - LOWER			
26	6701	28	RING, RETAINING, 2" SHAFT			
- 27	9267	1	CYLINDER, LIFT - UPPER			
28	20913	1	GUARD, CONTROL CORD, SHORT			
29	20839	1	GUARD, CONTROL CORD			
30	20663	1	HOSE TRAY			
31	20413	1	PIN, SLIDE, BASE			

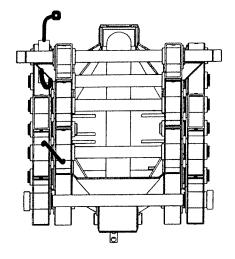


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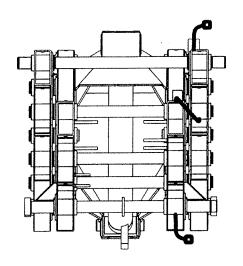
ITEM	PART NO.	QTY	DESCRIPTION	
1	20141	2	BLOCK, SLIDE - PLATFORM	
2	20217	1	BEAM, 3/16", SINGLE CYLINDER MOUNT	
3	10021	2	BEAM, OUTER, 3" X 6"	
	6669	6	BEARING	
4	8340	1	PIN, ROLLER - PLATFORM	
5	20365	2	SCISSORS MOUNT ASSEMBLY	
	6669	2	BEARING	
6	HDW7783	8	WASHER, SPLIT, LOCK, 3/8"	
7	HDW8277	8	SCREW, 3/8" - 16, 1 3/4" LG	
8	HDW5723	16	SCREW, 1/4" - 20, 3/4" LG	
9	20223	8	PLATE, CYLINDER PIN LOCK	
10	10020	4	BEAM, OUTER, 3" X 8"	
	6669	6	BEARING	
11	20224	4	PIN, CYLINDER	
12	20419	1	BEAM, INNER, CENTER	
13	20213	4	BEAM WELDMENT	
	6669	6	BEARING	
14	20215	1	BEAM, DOUBLE CYLINDER MOUNT	
15	20778	1	LOCK, MAINTENANCE	
16	HDW6455	14	SCREW, 1/4" - 20, 1/2" LG	
17	3219	2	BRACKET, MAINTENANCE LOCK	
18	6688	4	CLIP RING, 2" SHAFT	
19	20429	2	BLOCK, FIXED - BASE	
20	HDW8856	4	SCREW, 1/2" - 13, 5" LG	
21	HDW6463	4	NUT, 1/2" - 13, NYLON	
22	20222	1	BEAM, 1/4", SINGLE CYLINDER MOUNT	
23	20225	1	BEAM WELDMENT	
24	20142	2	BLOCK, SLIDE - BASE	
25	9276	1	CYLINDER, LIFT - LOWER	
26	6701	28	RING, RETAINING, 2" SHAFT	
27	9267	1	CYLINDER, LIFT - UPPER	
28	20913	1	GUARD, CONTROL CORD, SHORT	
29	20839	1	GUARD, CONTROL CORD	
30	20663	1	HOSE TRAY	
31	20413	1	PIN, SLIDE, BASE	

9431



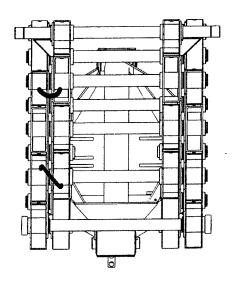


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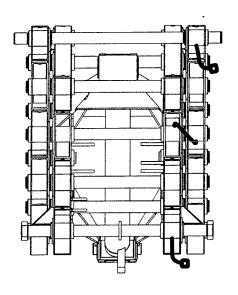


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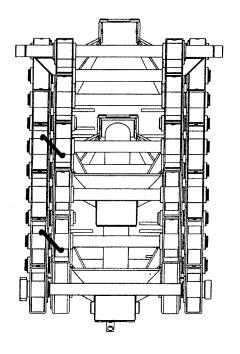


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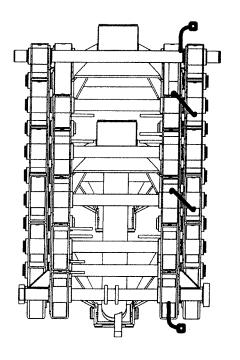
ITEM	PART NO.	QTY	DESCRIPTION
	9431	1	CABLE ROUTING - SCISSORS (2591RT)
	9432	1	CABLE ROUTING - SCISSORS (3391RT)
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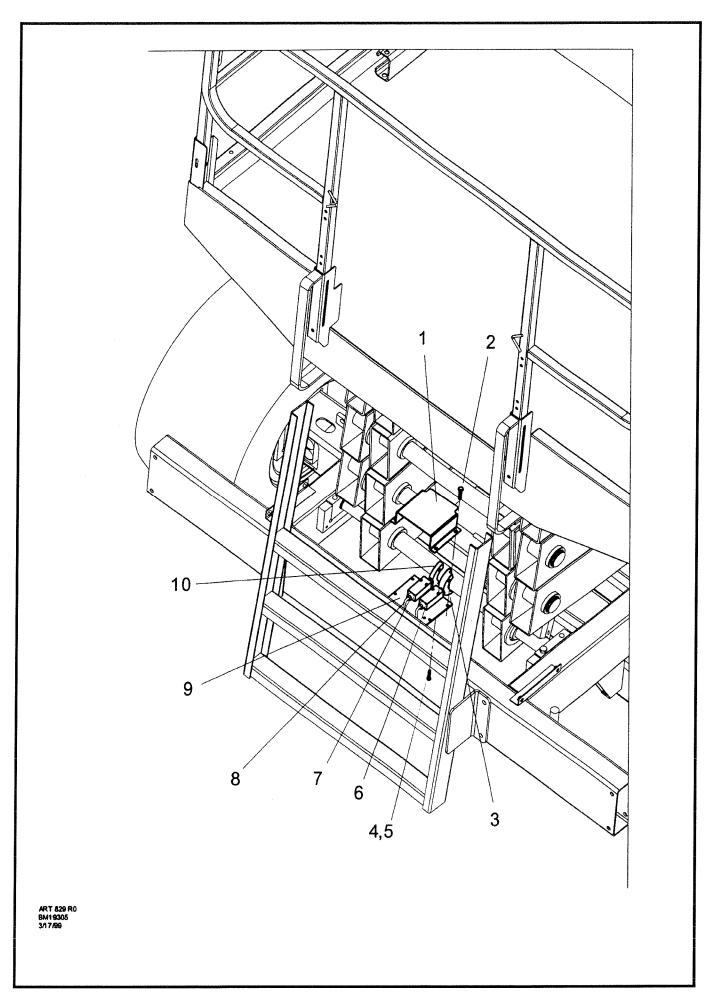


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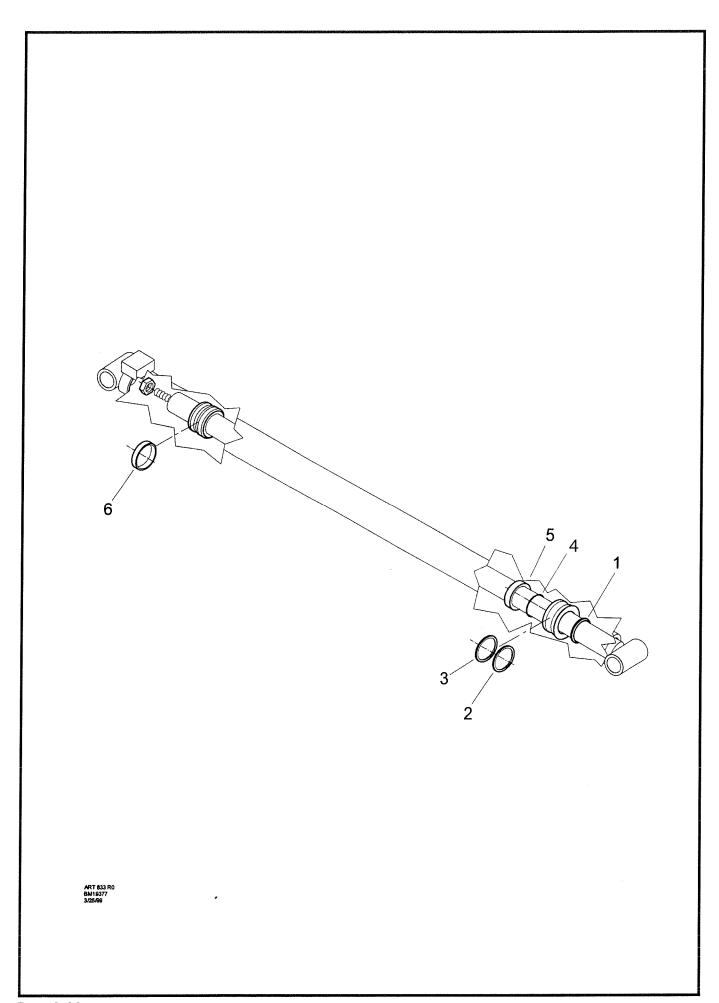
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ITEM	PART NO.	QTY	DESCRIPTION
	9431	1	CABLE ROUTING - SCISSORS (4191RT)
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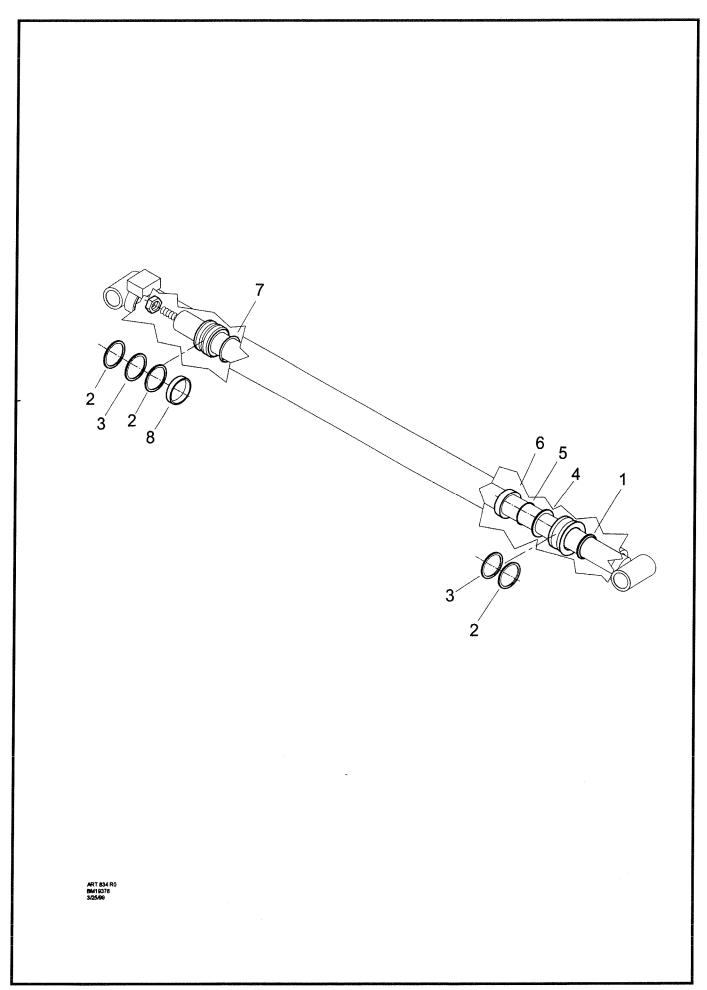


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ITEM	PART NO.	QTY	DESCRIPTION
1	20924	1	COVER, LIMIT SWITCH
2	HDW6455	4	SCREW, 1/4"- 20, 1/2" LG
3	20865	1	CAM, DRIVE CUT-OUT - 4191RT
4	HDW8482	2	SCREW, #8-32, 1 1/2"
5	HDW5251	2	NUT, #8-32
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6	8776	1	SWITCH, LIMIT, SINGLE POLE - 2591RT & 3391RT
		2	SWITCH, LIMIT, SINGLE POLE - 4191RT
7	7594	1	CONNECTOR, CORD
8	9427	1	HARNESS, LIMIT SWITCH
9	20827	1	BRACKET, LIMIT SWITCH
10	20838	1	CAM, SLOW SPEED - 4191 RT
	20864	1	CAM, SLOW SPEED - 3391RT
	20863	1	CAM, SLOW SPEED - 2591RT
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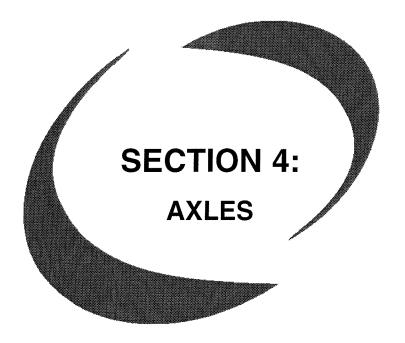
ITEM	PART NO.	QTY	DESCRIPTION
I I LIVI	9417	wii	SEAL KIT FOR CYLINDER 9267
1	0117	1	SEAL, DUST, 3 1/2" OD, 2 3/4" ID
2		1	BACKUP, 3" OD, 2 3/4" ID
3		1	O-RING, 3" OD, 2 3/4" ID
4		1	POLYPACK
5		1	RING,WEAR, 2 3/4" OD, 2 1/2" ID
6		1	RING, WEAR, 3" OD, 2 3/4" ID
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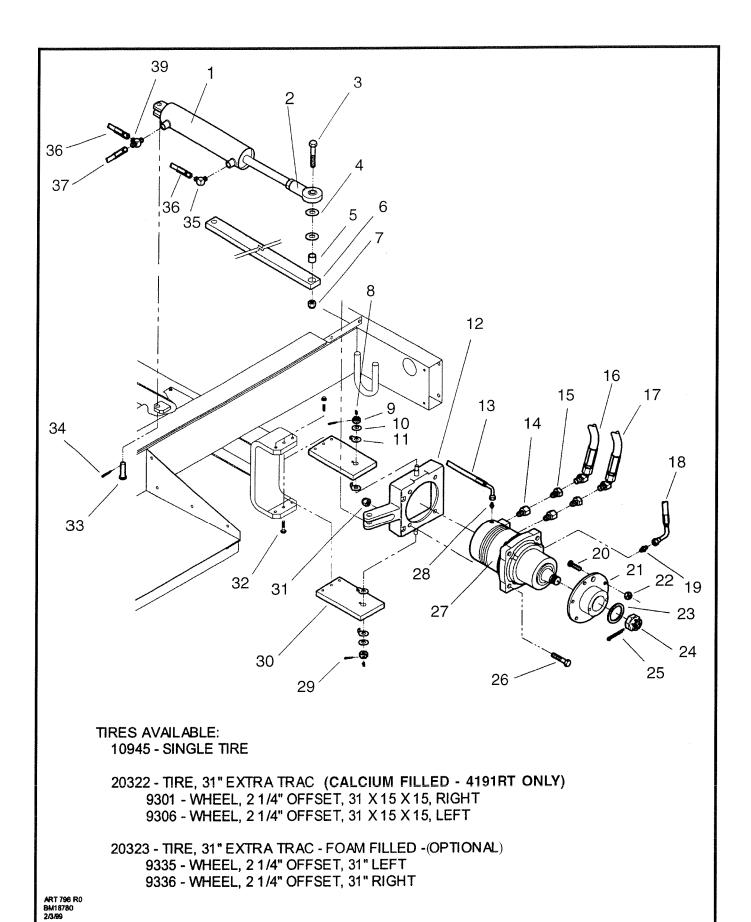


ITEM	PART NO.	QTY	DESCRIPTION
I I LIVI	9418	-	SEAL KIT FOR CYLINDER 9276
1 1		1	SEAL, DUST, 3 3/8" OD, 3" ID
2		3	BACKUP, 4" OD, 3 5/8" ID
3		2	O-RING, 4" OD, 3 5/8" ID
4		1	RING, BACKUP, 3 3/8" OD, 3" ID
5		1	O-RING, 3 3/8" OD, 3" ID
6		1	RING, WEAR, 3 1/4" OD, 3" ID
7		1	O-RING, 1 3/4" OD, 1 1/2" ID
8		1	RING, WEAR, 4" OD, 3 3/4" ID
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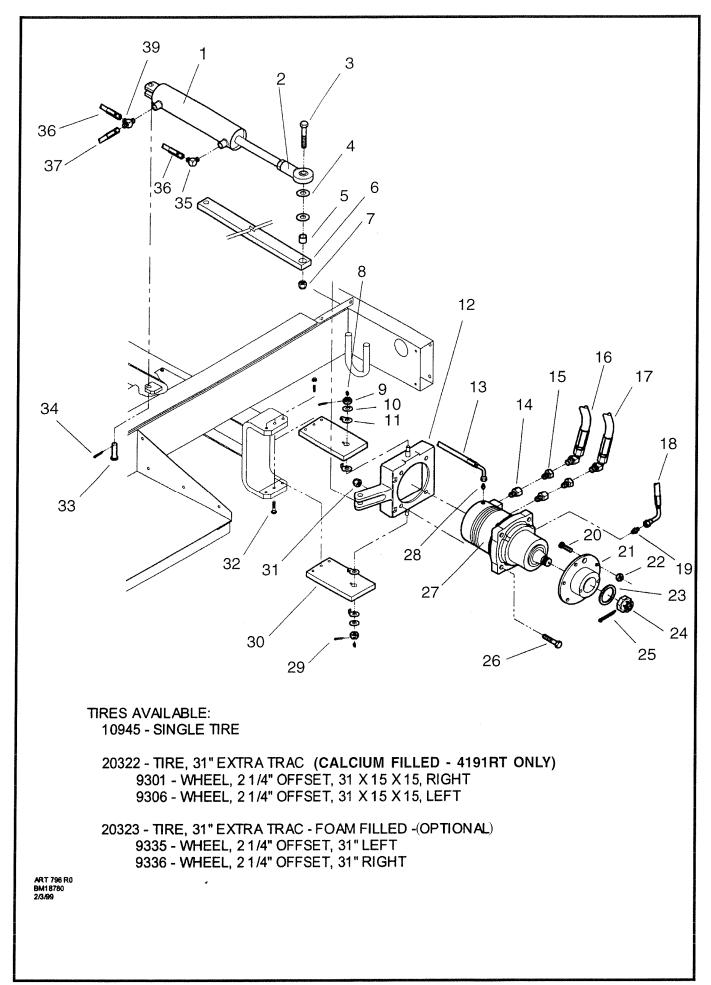
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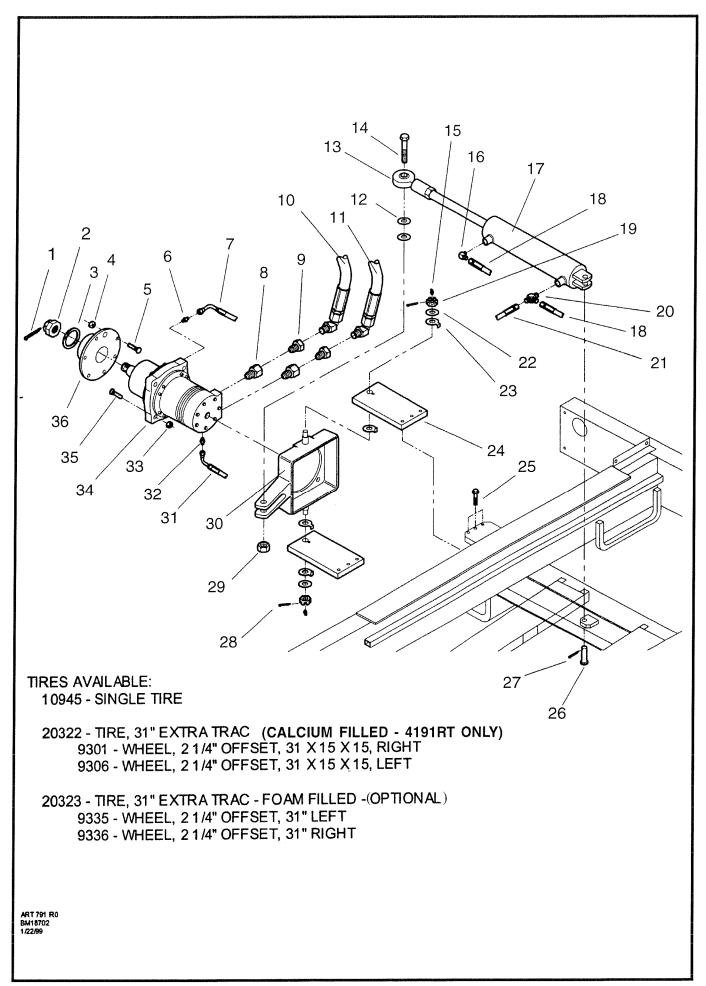




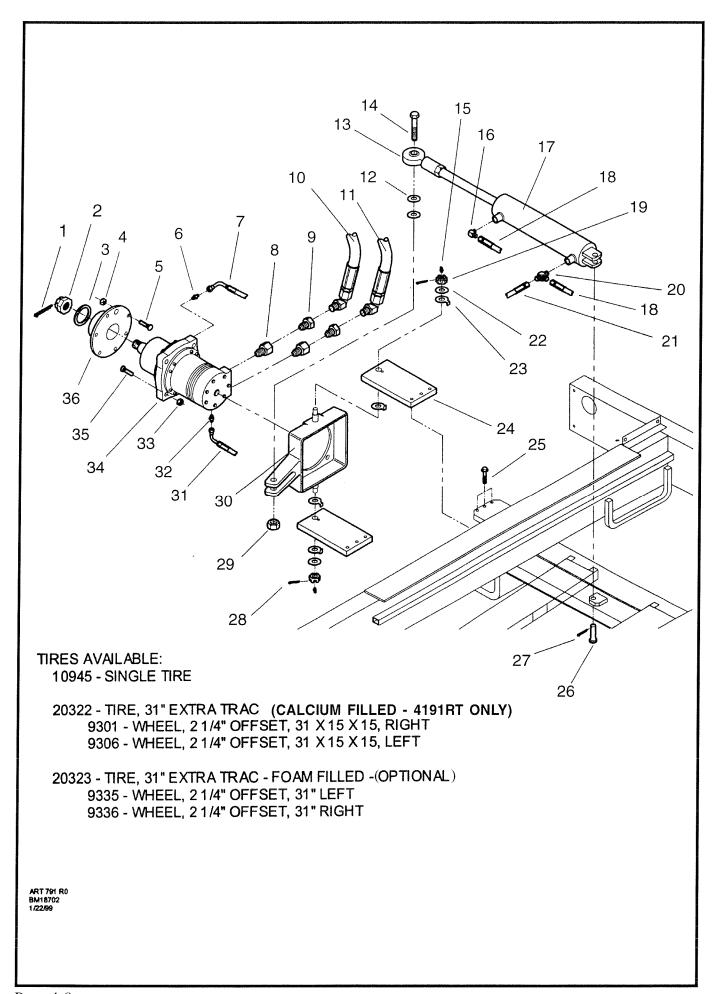
ITEM	PART NO.	QTY	DESCRIPTION			
1	10329	1	CYLINDER, STEERING			
2	7293	1	ROD END, BALL JOINT			
3	HDW7326	1	SCREW, 5/8" - 11, 4" LG			
4	HDW5785	2	WASHER, FLAT, 11/16" X 1 1/2" X 7/64"			
5	7292	1	BEARING, SLEEVE BRONZE			
6	20246	1	STEERING ARM			
7	HDW6633	1	NUT, LOCK, FLEX, 5/8"- 11			
8	9607	2	FITTING, GREASE, 90°			
9	HDW8568	2	NUT, SLOTTED HEX, 1 1/8" - 18			
10	20311	2	WASHER, 1 3/8" X 2 3/4" X 1/4"			
11	20312	4	WASHER, BEARING, FRONT AXLE			
12	20373	1	WHEEL MOTOR MOUNT, MACHINED			
13	9556	1	HOSE ASSY, STRGHT FML, 1/4" ID, 98" LG			
14	HDW7386	2	ADPTR, MALE, 3/4" O-RING, FML, 5/8" O-RING			
15	HDW7388	2	45° ELBOW, MALE 1/2", MALE 5/8", O-RING			
16	9384	1	HOSE ASSY, STRGHT FML, 1/2" ID, 100" LG			
17	9383	1	HOSE ASSY, STRGHT FML, 1/2" ID, 163" LG			
18	9411	1	HOSE ASSY, STRGHT FML, ELBW FML,1/4" ID, 93" LG			
19	HDW8881	1	ADAPTER, MALE 1/4" O-RING, MALE 1/4"			
20	HDW6676	6	BOLT, LUG, 1/2"-20, 1.42" LG			
21	14773	1	HUB, 6-BOLT, 6"			
22	HDW7961	6	NUT, LUG, 1/2" - 20			
23	9780	1	WASHER, WHEEL MOTOR			
24	HDW9037	1	CASTLE NUT, M42 X 3			
25	8925	1	PIN, COTTER, 1/4" X 3" LG			
26	HDW9603	4	SCREW			
27	9590	1	HYD WHEEL MOTOR WITH BRAKE - 4191RT			
	8843		HYD WHEEL MOTOR WITH BRAKE - 3391RT & 2591RT			
28	HDW8877	1	FITTING, 90° ELBOW, MALE 1/4" O-RING, MALE 1/4"			
29	HDW5787	2	PIN, COTTER, 1/8" X 1 1/2" LG			
30	20315	2	PLATE, STEERING PIVOT			
31	HDW6499	4	NUT, 5/8" - 11			
			CONT'D			



ITEM	PART NO.	QTY	DESCRIPTION
			CONT'D
32	HDW5215	6	SCREW, 1/2" - 13 X 1 3/4" LG
33	HDW5710	1	PIN, CLEVIS, 1/2" X 1 1/4" LG
34	HDW5920	1	PIN, COTTER, 1/8" X 1" LG
35	HDWT500	1	FITTING, MALE 90° ELBOW, MALE 1/4"
36	9400	2	HOSE ASSY, STRGHT FML, STRGHT FML,1/4" ID, 23" LG
37	9399	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 122" LG
38	HDW8895	1	FITTING, RUN TEE, MALE 1/4"
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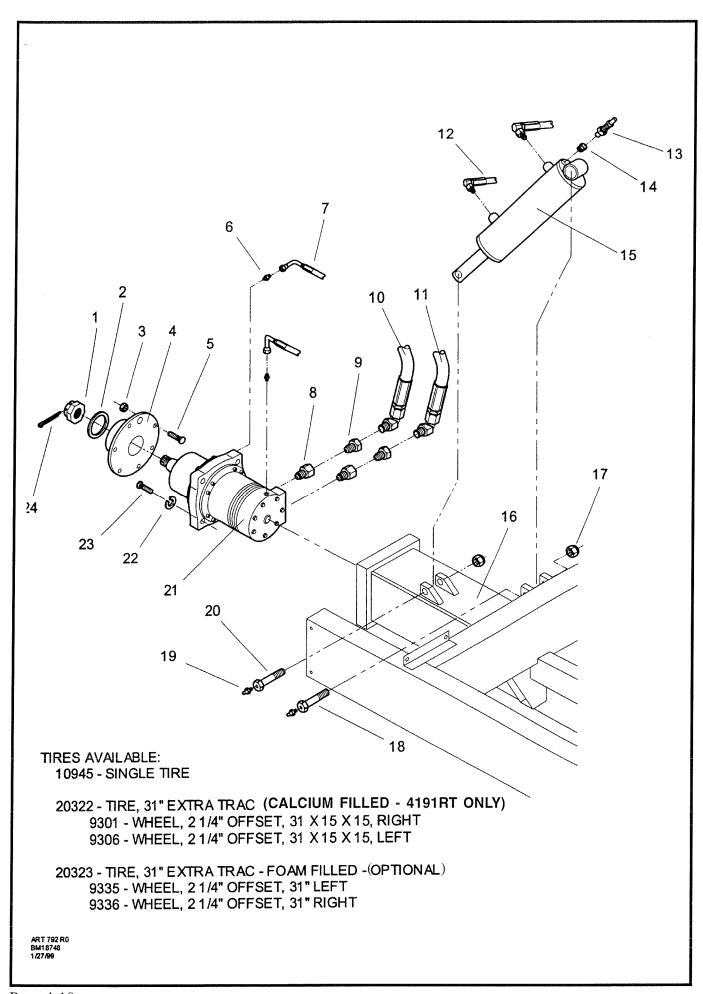


ITEM	PART NO.	QTY	DESCRIPTION
1	8925	1	PIN, COTTER, 1/4" X 3"
2	HDW9037	1	CASTLE NUT, M42 X 3
3	9780	1	WASHER, WHEEL MOTOR
4	HDW7961	6	NUT, LUG, 1/2" - 20
5	HDW6676	6	BOLT, LUG, 1/2"- 20, 1.42" LG
6	HDW8881	1	ADAPTER, MALE 1/4" O-RING, MALE 1/4"
7	9410	1	HOSE ASSY, STRGHT FML, 90° ELBW, FML, 1/4" ID, 88" LG
8	HDW7386	2	ADAPTER, MALE, 3/4" O-RING, FML, 5/8" O-RING
9	HDW7388	2	FITTING, 45° ELBOW, MALE 1/2", MALE 5/8", O-RING
10	9382	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/2" ID, 92" LG
11	9381	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/2" ID, 151" LG
12	HDW5785	2	WASHER, FLAT, 11/16" X 1 1/2" X 7/64"
13	7293	1	ROD END, BALL JOINT
14	HDW7326	1	SCREW, 5/8"-11, 4" LG
15	9607	2	FITTING, GREASE, 90°
16	HDW7500	1	FITTING, MALE 90° ELBOW, MALE 1/4"
17	10329	1	CYLINDER, STEERING
18	9400	2	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 23" LG
19	HDW8568	2	NUT, SLOTTED HEX, 1 1/8" - 18
20	HDW8895	1	RUN TEE, MALE 1/4"
21	9398	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 112" LG
22	20311	2	WASHER, 1 3/8" X 2 3/4" X 1/4"
23	20312	4	WASHER, BEARING, FRONT AXLE
24	20315	2	PLATE, STEERING PIVOT
25	HDW5215	6	SCREW, 1/2" - 13 X 1 3/4" LG
26	HDW5710	1	PIN, CLEVIS, 1/2" X 1 1/4" LG
27	HDW5920	1	PIN, COTTER, 1/8" X 1" LG
28	HDW5787	2	PIN, COTTER, 1/8" X 1 1/2" LG
29	HDW6633	1	NUT, LOCK, FLEX 5/8"-11
30	20373	1	CASTING, WHEEL MOTOR MOUNT, MACHINED
31	9555	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 98" LG
32	HDW8877	1	FITTING, 90° ELBOW, MALE 1/4" O-RING, MALE 1/4"
			CONT'D

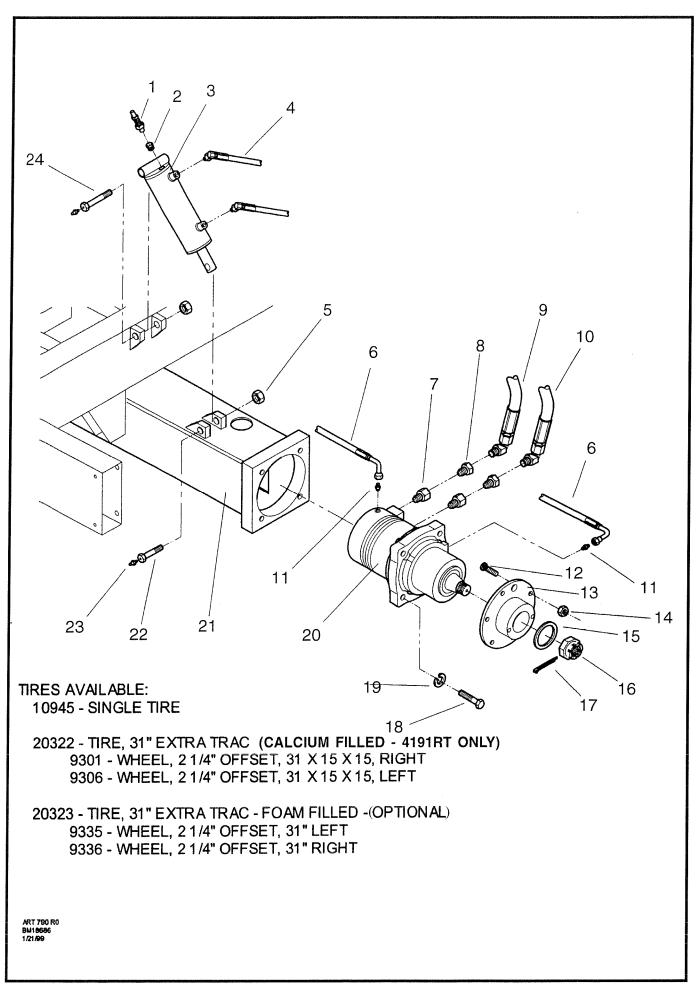


ITEM	PART NO.	QTY	DESCRIPTION
- ~			CONT'D
33	HDW6499	4	NUT, 5/8"-11
34	9590	1	HYD WHEEL MOTOR WITH BRAKE - 4191RT
	8843	1	HYD WHEEL MOTOR WITH BRAKE - 3391RT & 2591RT
35	HDW9603	4	SCREW
36	14773	1	HUB, 6-BOLT, 6"
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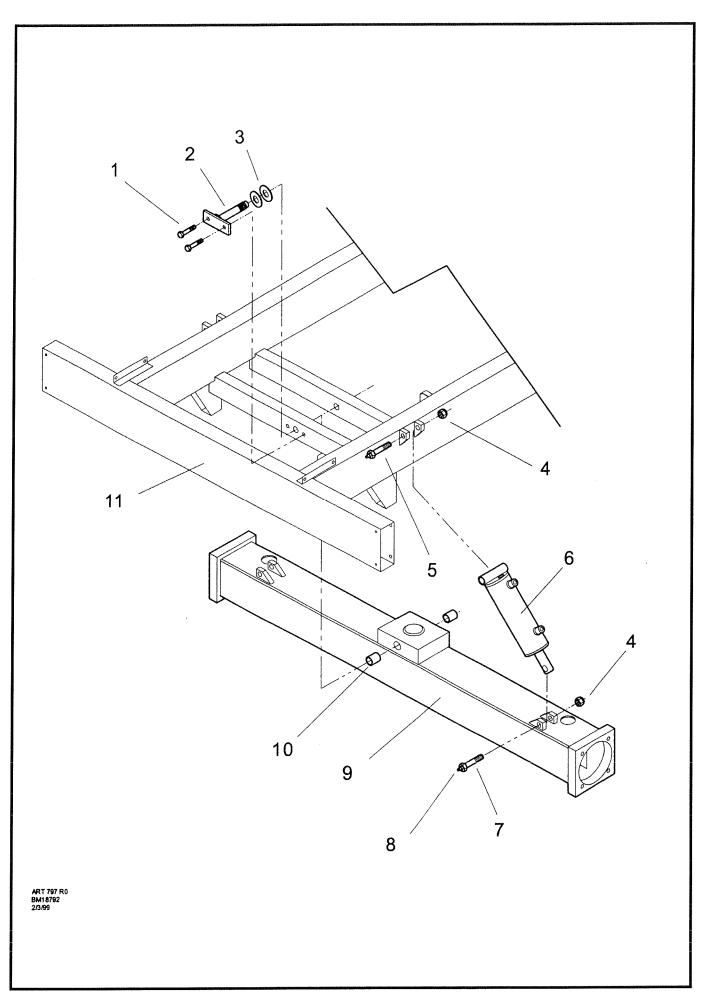
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ITEM	PART NO.	QTY	DESCRIPTION			
1	HDW9037	1	CASTLE NUT, M42 X 3			
2	9780	1	WASHER, WHEEL MOTOR			
3	HDW7961	6	NUT, LUG, 1/2" - 20			
4	14773	1	HUB, 6-BOLT, 6"			
5	HDW6676	6	BOLT, LUG, 1/2"-20, 1.42" LG			
6	HDW8881	2	ADAPTER, MALE 1/4" O-RING, MALE 1/4"			
7	9409	2	HOSE ASSY-STRGHT FML,90° ELBOW FML, 1/4" ID, 68" LG			
8	HDW7386	2	ADAPTER, MALE, 3/4" O-RING, FMLE 5/8", O-RING			
9	HDW7388	2	FITTING, 45° ELBOW, MALE 1/2", MALE 5/8", O-RING			
10	9386	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 62" LG			
11		1	HOSE ASSY-STRGHT FML, STRGHT FML,1/2" ID, 111" LG			
12	9450	2	HOSE ASSY-STRGHT FML, 90° ELBOW,			
			O-RING, 1/4" ID, 128" LG			
13	10853	1	BLEEDER			
14	HDW1 0852	1	ADAPTER, MALE 1 /8"-FML 1/4"			
15	7147	1	CYLINDER-AXLE, LOCKING			
	7574	1	REPAIR KIT, AXLE CYLINDER			
16	20256	1	REAR AXLE WELDMENT			
17	HDW6633	2	NUT, LOCK, FLEX 5/8"-11			
18	10355	1	PIN, CYLINDER- UPPER			
19	5432	2	FITTING, GREASE			
20	10354	1	PIN, CYLINDER- LOWER			
21	9590	1	HYD WHEEL MOTOR WITH BRAKE - 4191RT			
	8843	1	HYD WHEEL MOTOR WITH BRAKE - 3391RT & 2591RT			
22	HDW5994	1	WASHER, SPLIT			
23	HDW9603	1	SCREW			
24	8925	1	COTTER PIN,1/4" X 3" LG			
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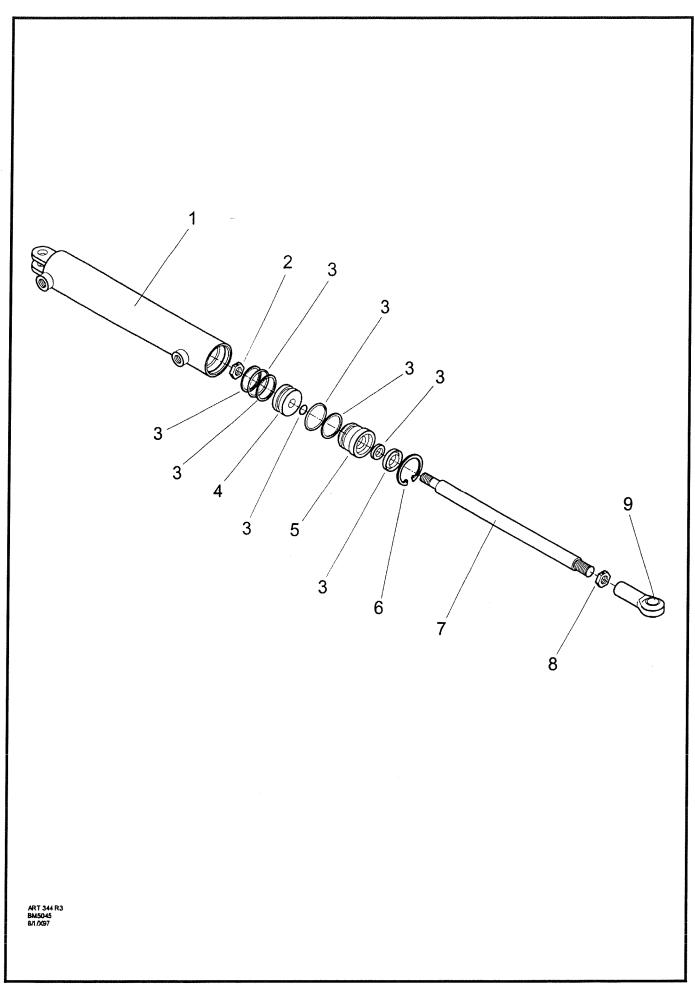


ITEM	PART NO.	QTY	DESCRIPTION
1	10853	1	BLEEDER
2	HDW1 0852	1	ADAPTER, MALE 1/8"-FML 1/4"
3	7147	1	CYLINDER-AXLE, LOCKING
	7574	1	REPAIR KIT, AXLE CYLINDER
4	9451	2	HOSE ASSY-STRGHT FML SWIVEL, ELBW, O-RNG. 1/4" ID,
			145" LG
5	HDW6633	2	NUT, LOCK, FLEX 5/8"-11
6	9408	1	HOSE ASSY-STRGHT FML, ELBOW FML, 3/8" ID, 66" LG
7	HDW7386	2	ADAPTER, MALE, 3/4" O-RING, FML, 5/8" O-RING
8	HDW7388	2	FITTING, 45° ELBOW, MALE 1/2", MALE 5/8", O-RING
9	9388	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/2" ID, 130" LG
10	9386	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/2" ID, 62" LG
11	HDW8881	1	ADAPTER, MALE 1/4" 0-RING, MALE 1/4"
12	HDW6676	1	BOLT, LUG, 1/2"-20, 1.42" LG
13	14773	1	HUB, 6-BOLT, 6"
14	HDW7961	6	NUT, LUG, 1/2" - 20
15	9780	1	WASHER, WHEEL MOTOR
16	HDW9037	1	CASTLE NUT, M42 X 3
17	8925	1	COTTER PIN, 1/4" X 3"
18	HDW9603		SCREW
19	HDW5994	-	WASHER, SPLIT
20	9590	1	HYD WHEEL MOTOR WITH BRAKE - 4191RT
	8843	1	HYD WHEEL MOTOR WITH BRAKE - 3391RT & 2591RT
21	20256	1	REAR AXLE WELDMENT
22	10354	1	PIN, CYLINDER- LOWER
23	5432	2	FITTING, GREASE
24	10355	1	PIN, CYLINDER- UPPER
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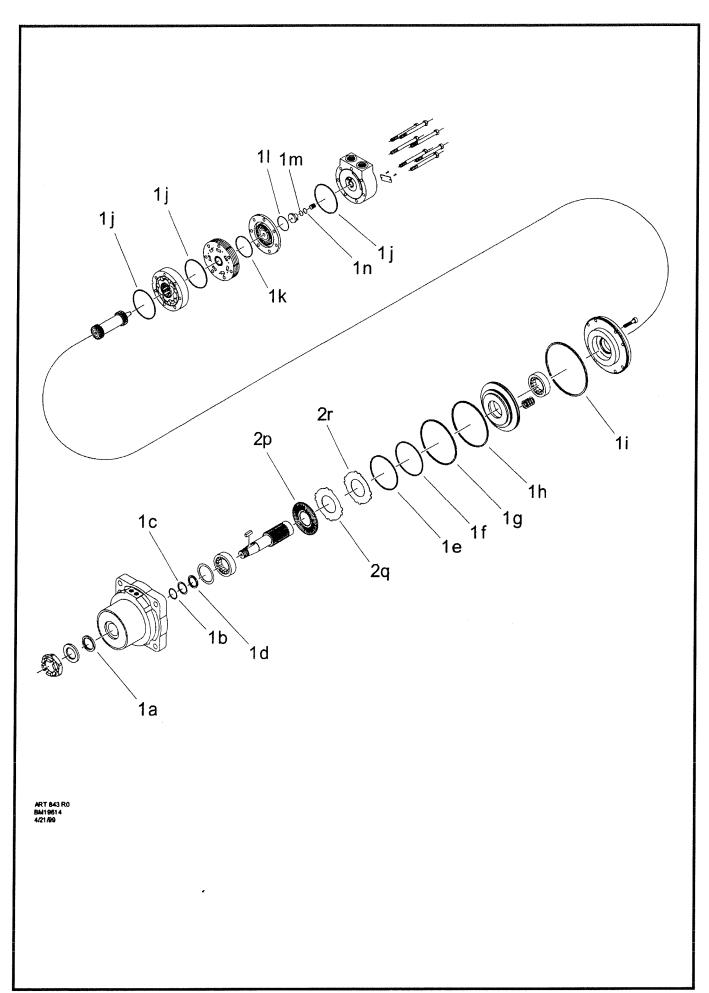


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ITEM	PART NO.	QTY	DESCRIPTION		
1	HDW5204	2	SCREW, 5/16" - 18,1" LG		
2	10423	1	PIVOT PIN WELDMENT		
3	10424	2	AXLE GUIDE, NYLON, ATV		
4	HDW6633	2	NUT, LOCK, FLEX, 5/8"-11		
5	10355	1	PIN, CYLINDER, UPPER		
6	7147	1	CYLINDER, AXLE, LOCK		
7	10354	1	PIN, CYLINDER, LOWER		
8	5432	2	FITTING, GREASE		
9	20256	1	REAR AXLE WELDMENT		
10	7196	2	BEARING		
11	20892	1	BASE WELDMENT, 4191RT		
	20409	1	BASE WELDMENT, 2591RT & 3391RT		
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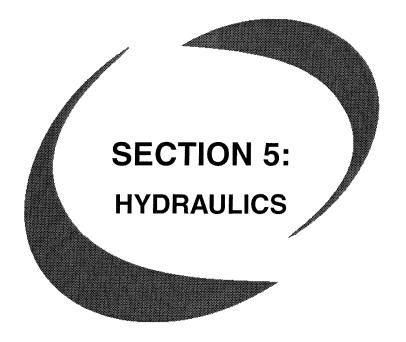


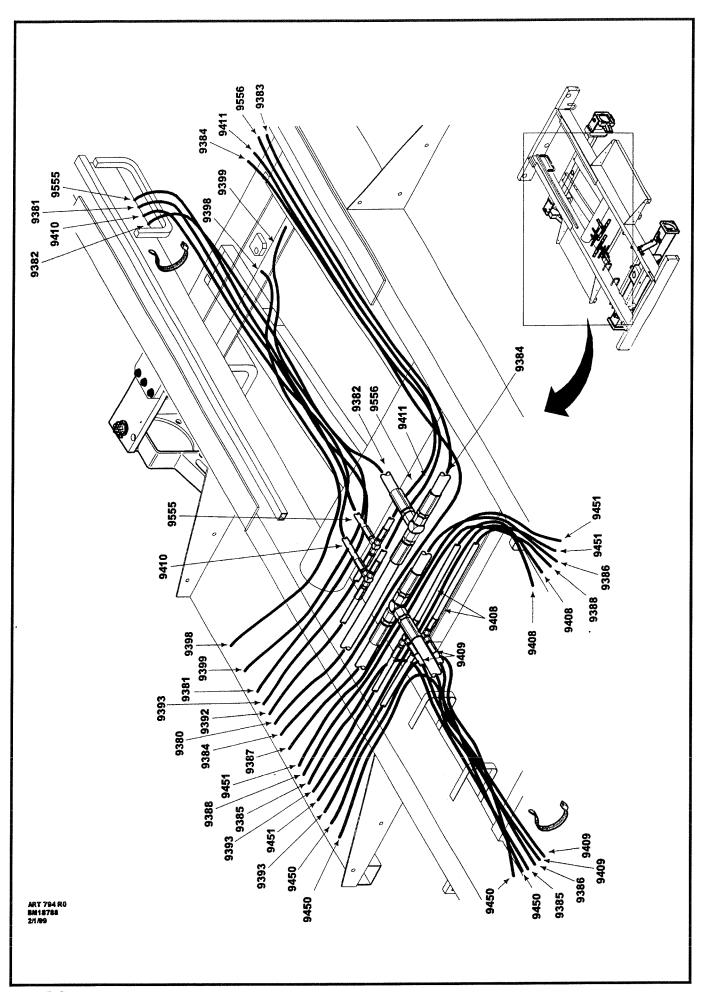
ITEM	PART NO.	QTY	DESCRIPTION					
	10329	_	STEERING CYLINDER ASSEMBLY					
1	10048	1	CYLINDER WELDMENT- STEERING					
2	6338	1	NUT, 1/2"-20					
3	5947	1	SEAL KIT					
4	2494	1	PISTON, CYLINDER					
5	2493	1	HEAD, CYLINDER					
6	6337	1	RING, INTERNAL RETAINING					
7	10041	1	ROD, CYLINDER					
8	5925	1	NUT					
9	7293	1	ROD END, BALL JOINT					
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g 1 LARGE O-RING SEAL h 1 LARGE TEFLON SEAL				
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i 1 O-RING SEAL				
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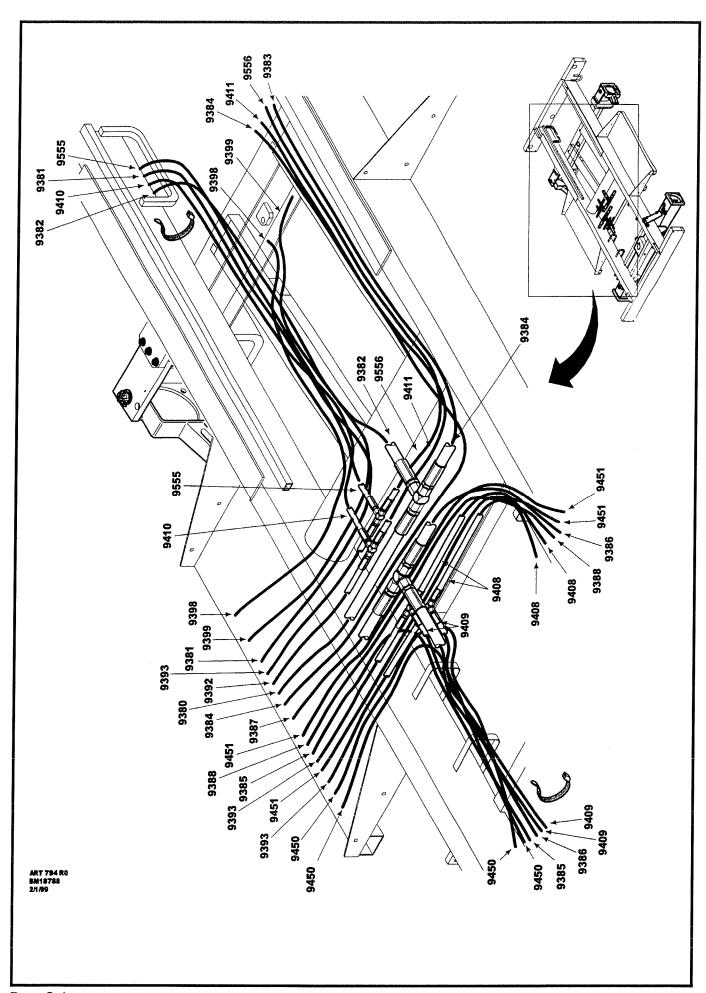
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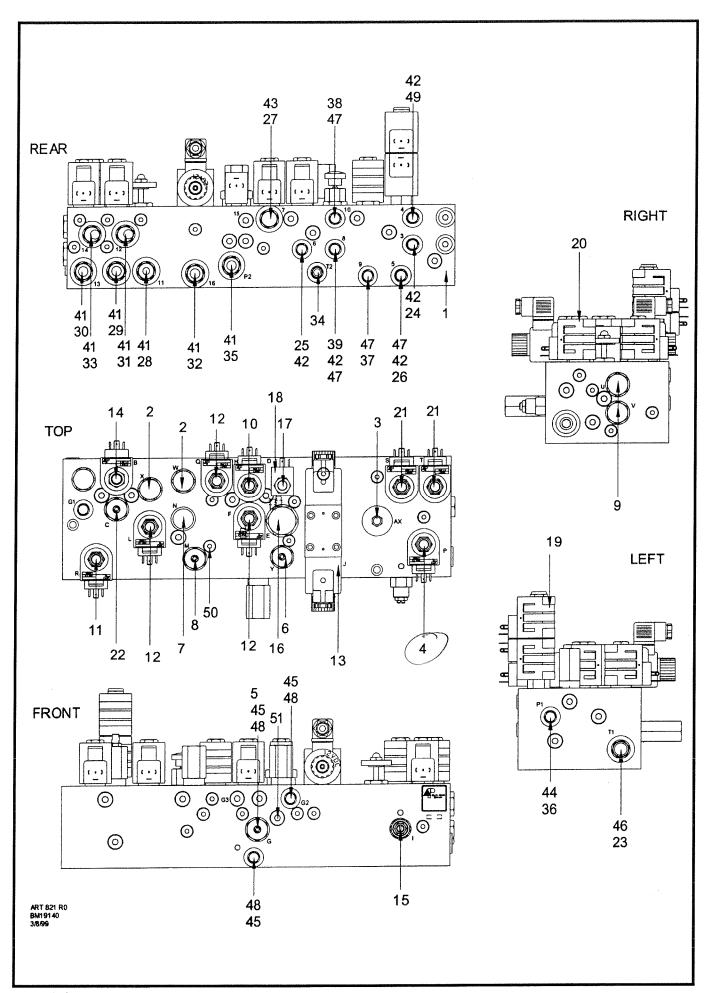
Page 5-2

ITEM	PART NO.	QTY	DESCRIPTION
	9532K	-	HOSE KIT, 4191RT
	9533K	-	HOSE KIT, 3391RT & 2591RT
	9031	1	STRGHT FML, STRGHT FML, 3/8" ID, 36" LG (4191RT)
	9380	1	STRGHT FML, STRGHT FML, 1/2" ID, 66" LG
	9381	1	STRGHT FML, STRGHT FML, 1/2" ID, 151" LG
	9382	1	STRGHT FML, STRGHT FML, 1/2" ID, 92" LG
	9383	1_	STRGHT FML, STRGHT FML, 1/2" ID, 163" LG
	9384	1	STRGHT FML, STRGHT FML, 1/2" ID, 100" LG
	9385	1	STRGHT FML, STRGHT FML, 1/2" ID, 115" LG
	9386	2	STRGHT FML, STRGHT FML, 1/2" ID, 62" LG
	9387	1	STRGHT FML, STRGHT FML, 1/2" ID, 57" LG
	9388	1	STRGHT FML, STRGHT FML, 1/2" ID, 130" LG
	9389	1	STRGHT FML, STRGHT FML, 1/2" ID, 44" LG
	9390	1	STRGHT FML, STRGHT FML, 1/2" ID, 109" LG
	9391	1	STRGHT FML, STRGHT FML, 1/2" ID, 102" LG
	9392	1	STRGHT FML, STRGHT FML, 1/4" ID, 64" LG
	9393	3	STRGHT FML, STRGHT FML, 1/4" ID, 48" LG
	9394	1	STRGHT FML, STRGHT FML, 1/4" ID, 120" LG
	9395	1	STRGHT FML, STRGHT FML, 1/4" ID, 381" LG (4191RT)
	9396	1	STRGHT FML, STRGHT FML, 1/4" ID, 280" LG (4191RT)
	9397	1	STRGHT FML, STRGHT FML, 1/4" ID, 221" LG (4191RT)
	9398	1	STRGHT FML, STRGHT FML, 1/4" ID, 112" LG
	9399	1	STRGHT FML, STRGHT FML, 1/4" ID, 122" LG
	9400	1	STRGHT FML, STRGHT FML, 1/4" ID, 23" LG
	9401	1	STRGHT FML, STRGHT FML, 1/4" ID, 28" LG
	9406	1	STRGHT FML, STRGHT FML, 3/8" ID, 280" LG (4191RT)
	9407	1	STRGHT FML, STRGHT FML, 3/8" ID, 220" LG (4191RT)
	9408	2	STRGHT FML, ELBOW FML, 1/4" ID, 66" LG
	9409	2	STRGHT FML, ELBOW FML, 1/4" ID, 68" LG
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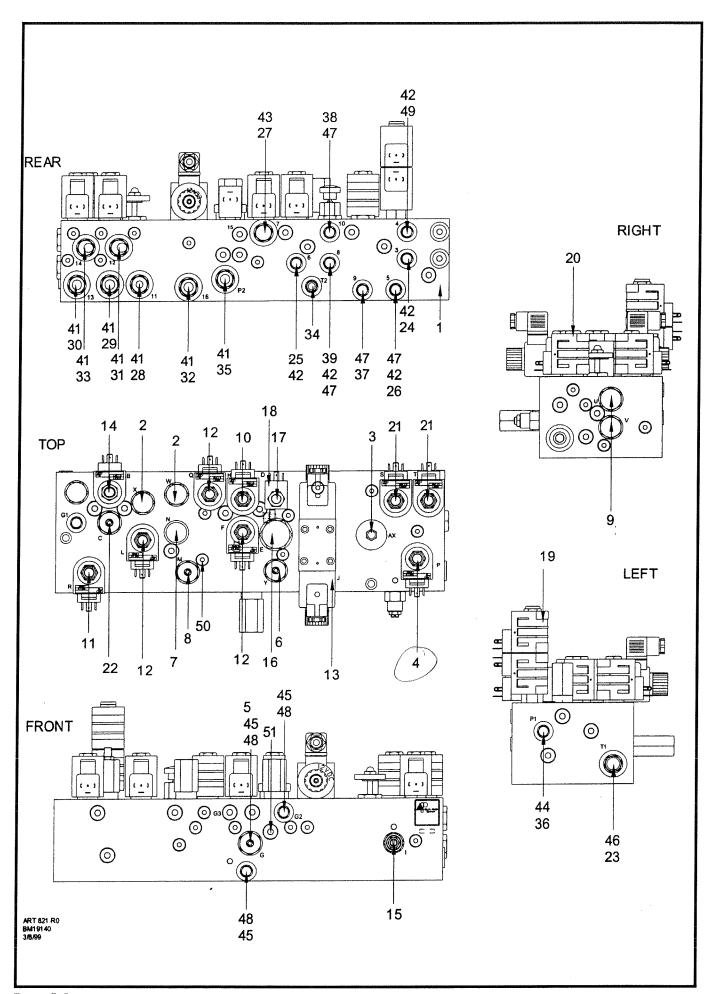
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TIEN	PART NO.	QTY	DESCRIPTION CONT'D
	9410	1	STRGHT FML, ELBOW FML, 1/4" ID, 85" LG
	9411	1	STRGHT FML, ELBOW FML, 1/4" ID, 93" LG
	9411	2	
	9450	2	STRGHT FML, ELBOW FML, 1/4" FD, 128" LG
	9451	1	STRGHT FML, ELBOW, O-RING, SWIVEL, 1/4" ID, 145" LG
	9476	1	STRGHT FML, STRGHT FML, 1/4" ID, 32" LG
	9476	1	STRGHT FML, STRGHT FML, 1/4" ID, 83" LG
			HOSE, LOW PRESSURE, 1" ID, 82" LG
	9546	1	STRGHT FML, STRGHT FML, 3/4" ID, 44" LG
	9555	1	STRGHT FML, STRGHT FML, 1/4" ID, 98" LG
	9556	4	STRGHT FML, STRGHT FML, 1/4" ID, 98" LG
	9584	1	STRGHT FML, STRGHT FML, 3/8" ID, 24" LG
	9522	1	STRGHT FML, STRGHT FML, 1/4" ID, 259" LG
			(2591RT, 3391RT)
	9523	1	STRGHT FML, STRGHT FML, 3/8" ID, 257" LG
			(2591RT, 3391RT)
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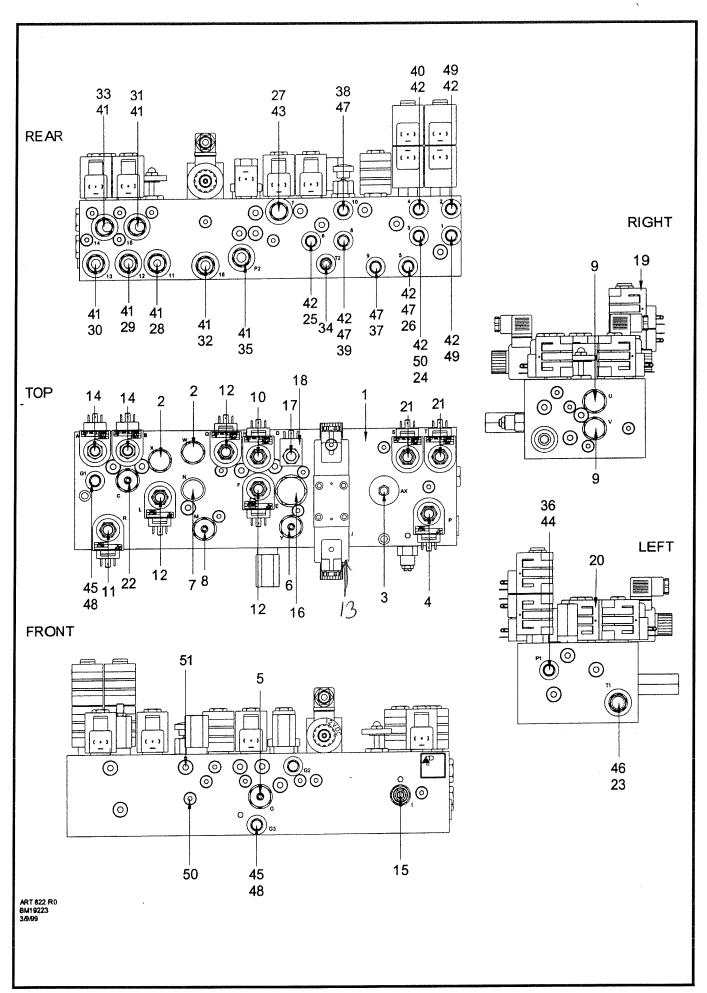
Page 5-6

ITEM	PART NO.	QTY	DESCRIPTION
	20696		MAIN MANIFOLD ASSY- WITHOUT OUTRIGGERS, (10 GPM)
			2591RT & 3391RT
1	9467	1	MANIFOLD BLOCK
2	9504	2	VALVE, CHECK
3	9505	1	VALVE, NEEDLE
4	6975	1	VALVE, N/O SPOOL
5	9663	1	VALVE, RELIEF
6	96649-711	1	VALVE, RELIEF 3coe 851
7	9665	1	VALVE, MANUAL
8	9666	1	VALVE, PRESSURE REDUCING
9	9667	2	FLOW DIVIDER/COMBINER
10	6973	1	VALVE, N/C POPPET 2 WAY
11	9511	1	VALVE, 2 WAY N/O
12	9512	3	VALVE, 3W2P SPOOL
13	9668	1	VALVE, 4W3P
14	9041	1	VALVE, 4 WAY, 3 POSITION
15	9606	1	VALVE, COUNTERBALANCE
16	9670	1	VALVE, PRESSURE REGULATED
17	9671	1	CARTRIDGE
18	9672	1	COIL-12 VOLT
19	9519	2	COIL-12 VOLT
20	9520	8	COIL-12 VOLT
21	8373	2	VALVE, 4 WAY
22	97119664	1	VALVE, RELIEF 15 CO PST
23	9546	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/4" ID, 34" LG
24	9398	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 96" LG
25	9401	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 28" LG
26	9452	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 20" LG
27	9523	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/8" ID, 257" LG
28	9380	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 66" LG
29	9381	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 151"LG
			(CONT'D)



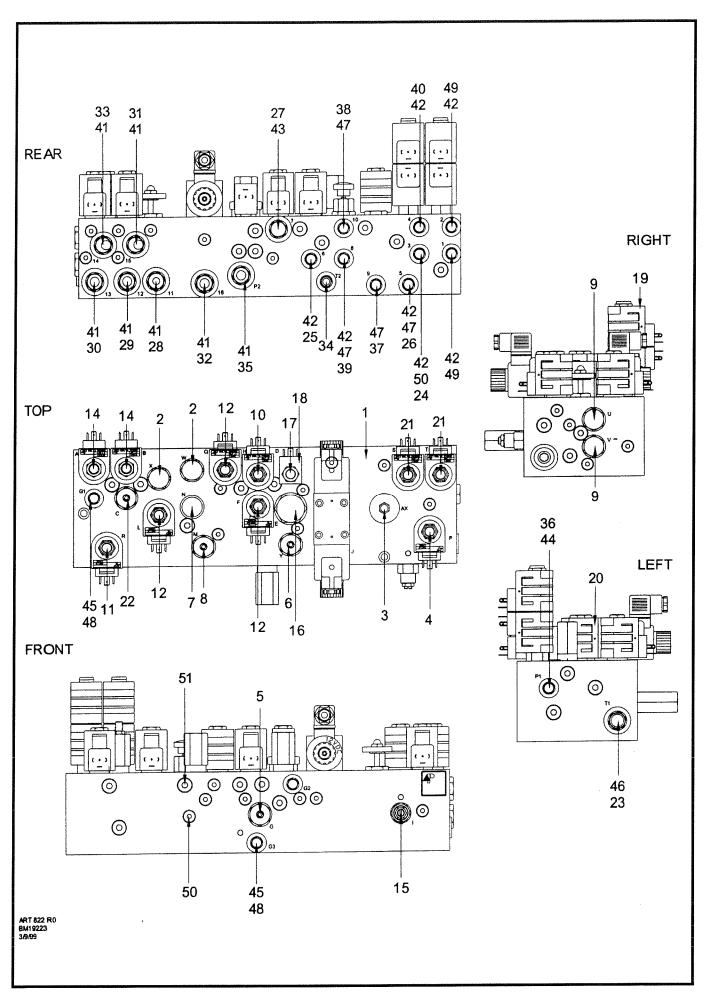
Page 5-8

ITEM	PART NO.	QTY	DESCRIPTION
	20696	-	MAIN MANIFOLD ASSY - WITHOUT OUTRIGGERS, (10 GPM)
			2591RT & 3391RT (CONT'D)
30	9383	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID,163" LG
31	9385	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 115" LG
32	9387	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 57" LG
33	9388	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 130" LG
34	9389	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 44" LG
35	9390	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 109" LG
36	9391	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 102" LG
37	9392	1	HOSE ASSY-STRGHT FML, STRGHT FML, 114" ID, 64" LG
38	9393	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 48" LG
39	9394	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 120" LG
40	9584	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/8" ID, 28" LG
41	HDW6725	7	ADAPTER, MALE 1/2", MALE 5/8", O-RING
42	HDW7438	5	ADAPTER, MALE 3/8", MALE 9/16"
43	HDW7600	1	ADAPTER, MALE 3/8", MALE 3/8", O-RING
44	HDW7779	1	FITTING, 90° ELBOW, MALE 1/2", MALE 3/8", O-RING
45	HDW7971	3	FITTING, MALE, QUICK DISCONNECT, 1/4"
46	HDW9459	1	FITTING, 90° ELBOW, MALE 5/8", O-RING, MALE 3/4"
47	HDW9472	4	UNION, MALE 1/4", MALE 3/8", O-RING
48	HDW9604	3	ADAPTER, MALE 3/8" X 1/4"
49	9399	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 101" LG
50	HDW8975	36	PLUG, SAE #4
51	7484	25	PLUG, SAE #6
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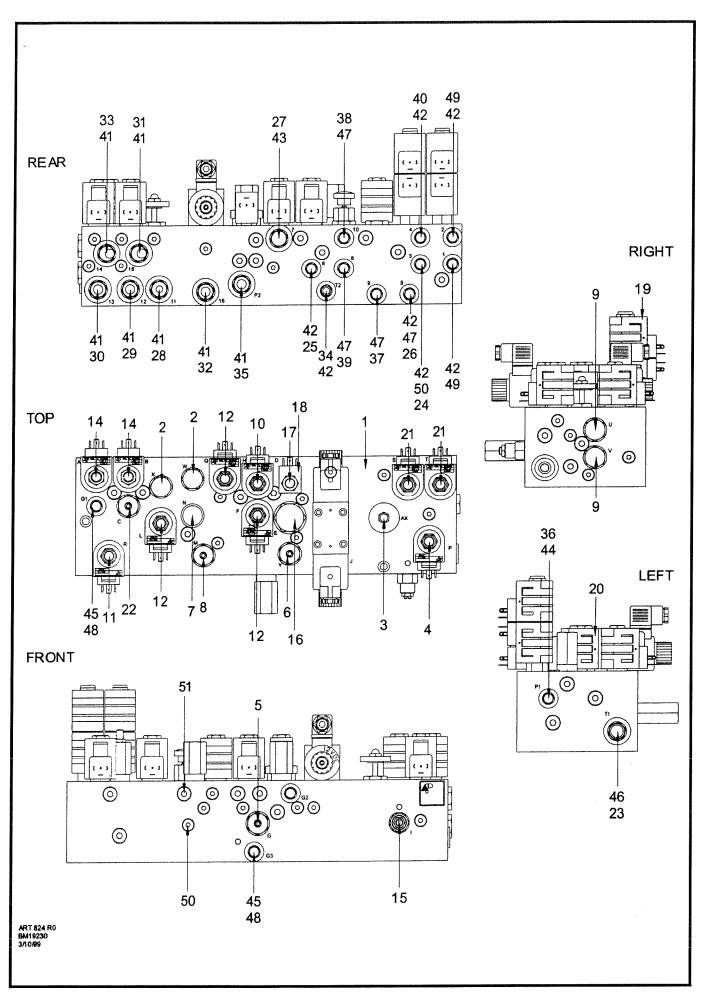
Page 5-10

ITEM	PART NO.	QTY	DESCRIPTION
	20669		MAIN MANIFOLD ASSY - WITH OUTRIGGERS, (10 GPM)
			2591RT & 3391RT
1	9445	1	MANIFOLD BLOCK
2	9504	2	VALVE, CHECK
3	9505	1	VALVE, NEEDLE
4	6975	1	VALVE, N/O SPOOL
5	9663	1	VALVE, RELIEF
6	96649711	1	VALVE, RELIEF 3 coe PSI
7	9665	1	VALVE, MANUAL
8	9666	1	VALVE, PRESSURE REDUCING
9	9667	2	FLOW DIVIDER/COMBINER
10	6973	1	VALVE, N/C POPPET 2 WAY
11	9511	1	VALVE, 2 WAY N/O
12	9512	3	VALVE, 3W2P SPOOL
13	9668	1	VALVE, 4W3P
14	9041	2	VALVE, 4 WAY, 3 POSITION
15	9609	1	VALVE, COUNTERBALANCE
16	9670	1	VALVE, PRESSURE REGULATED
17	9671	1	CARTRIDGE
18	9672	1	COIL-12 VOLT
19	9519	4	COIL-12 VOLT
20	9520	8	COIL-12 VOLT
21	8373	2	VALVE, 4 WAY
22	97119664	1	VALVE, RELIEF 15-0PST
23	9546	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/4" ID, 34" LG
24	9398	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 96" LG
25	9401	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 28" LG
26	9452	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 20" LG
27	9523	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/8" ID, 257" LG
28	9380	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 66" LG
29	9381	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 151" LG
			(CONT'D)



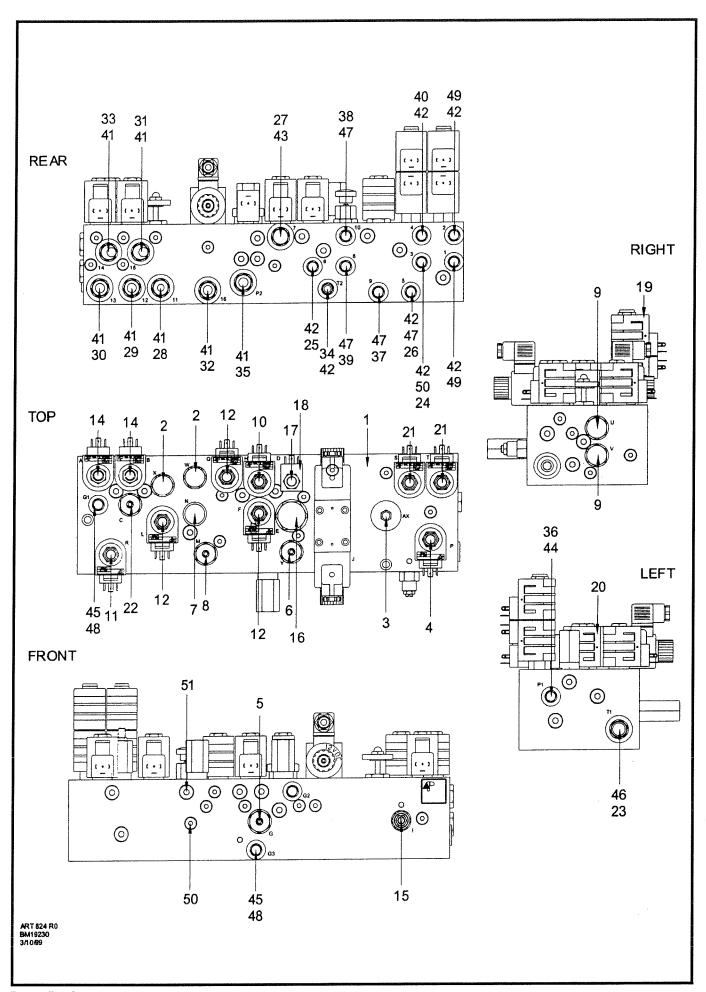
Page 5-12

ITEM	PART NO.	QTY	DESCRIPTION
I I LIVI	20696		MAIN MANIFOLD ASSY - WITH OUTRIGGERS, (10 GPM)
			2591RT & 3391RT, (CONT'D)
30	9383	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 163" LG
31	9385	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 115" LG
32	9387	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 57" LG
33	9388	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 130" LG
34	9389	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 44" LG
35	9390	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 109" LG
36	9391	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 102" LG
37	9392	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 64" LG
38	9393	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 48" LG
39	9394	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 120" LG
40	9399	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 101" LG
41	HDW6725	7	ADAPTER, MALE 1/2", MALE 5/8", O-RING
42	HDW7438	7	ADAPTER, MALE 3/8", MALE 9/16"
43	HDW7600	1	ADAPTER, MALE 3/8", MALE 3/8", O-RING
44	HDW7779	1 1	FITTING, 90° ELBOW, MALE 1/2", MALE 3/8", O-RING
45	HDW7971	3	FITTING, MALE, QUICK DISCONNECT, 1/4"
46	HDW9459	1	FITTING, 90° ELBOW, MALE 5/8", O-RING, MALE 3/4"
47	HDW9472	4	FITTING, UNION, MALE 1/4", MALE 3/8", O-RING
48	HDW9604	3	FITTING, ADAPTER, MALE 3/8" X 1/4"
49	9404	2	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 63" LG
50	HDW8975	36	PLUG, SAE #4
51	7484	25	PLUG, SAE #6
	9422	1	HARNESS, MANIFOLD
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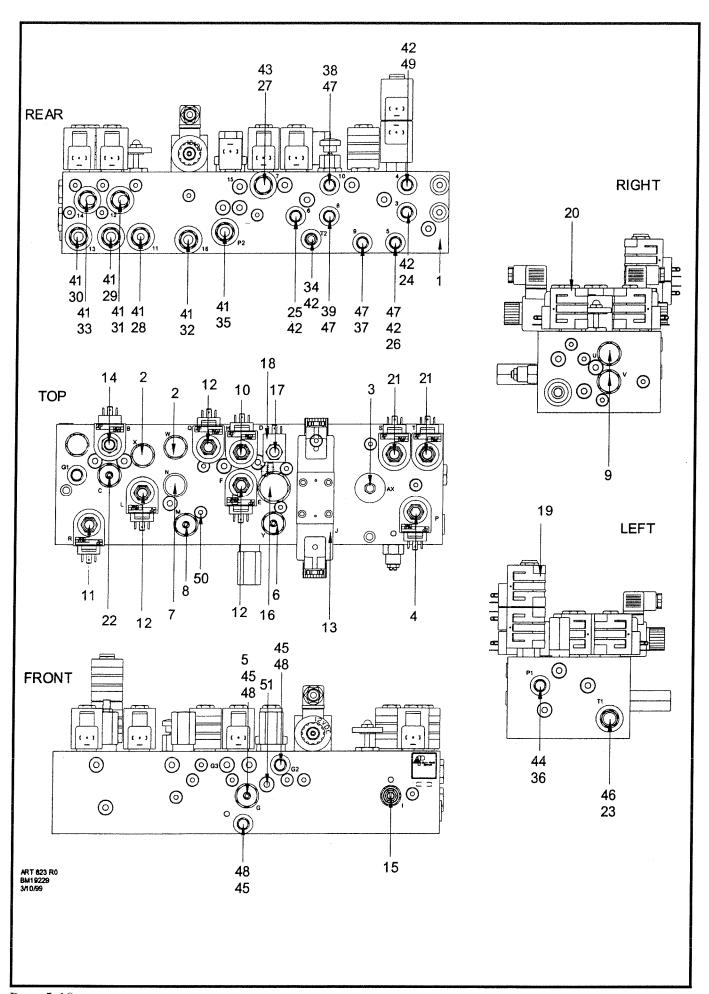
Page 5-14

ITEM	PART NO.	QTY	DESCRIPTION
	20966	-	MAIN MANIFOLD ASSEMBLY-WITH OUTRIGGERS, (15 GPM)
			4191RT
1	9656	1	MANIFOLD BLOCK
2	9504	2	VALVE, CHECK
3	9505	1	VALVE, NEEDLE
4	6975	1	VALVE, N/O SPOOL
5	9663	1_	VALVE, RELIEF
6	96649711	1	VALVE, RELIEF 3 COO PST
7	9665	1	VALVE, MANUAL
8	9666	1	VALVE, PRESSURE REDUCING
9	9667	2	FLOW DIVIDER/COMBINER
10	6973	1	VALVE, N/C POPPET 2 WAY
11	9511	1	VALVE, 2 WAY N/O
12	9512	3	VALVE, 3W2P SPOOL
13	9668	1	VALVE, 4W3P
14	9041	2	VALVE, 4 WAY, 3 POSITION
15	9609	1	VALVE, COUNTERBALANCE
16	9670	1	VALVE, PRESSURE REGULATED
17	90718517	1	CARTRIDGE
18	9672	1	COIL-12 VOLT
19	9519	4	COIL-12 VOLT
20	9520	8	COIL-12 VOLT
21	8373	2	VALVE, 4 WAY
22	9711 5664	1	VALVE, RELIEF 15 COPSI
23	9546	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/4" ID, 34" LG
24	9398	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 96" LG
25	9401	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 28" LG
26	9452	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 20" LG
27	9407	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/8" ID, 220" LG
28	9380	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 66" LG
29	9381	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 151" LG
			(CONT'D)



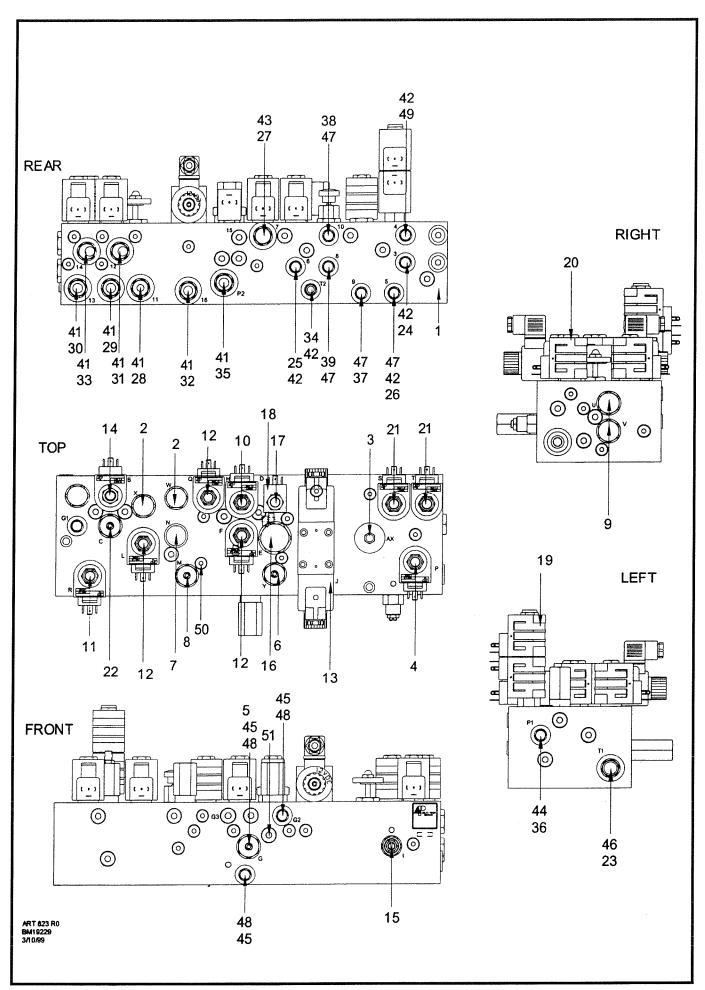
Page 5-16

ITEM	PART NO.	QTY	
	20966	-	MAIN MANIFOLD ASSEMBLY-WITH OUTRIGGERS, (15 GPM)
			4191RT (CONT'D)
30	9383	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 163" LG
31	9385	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 115" LG
32	9387	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 57" LG
33	9388	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 130" LG
34	9389	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 44" LG
35	9390	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 109" LG
36	9391	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 102" LG
37	9392	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 64" LG
38	9393	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 48" LG
39	9394	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 120" LG
40	9399	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 101" LG
41	HDW6725	7	ADAPTER, MALE 1/2", MALE 5/8", O-RING
42	HDW7438	7	ADAPTER, MALE 3/8", MALE 9/16"
43	HDW7600	1	ADAPTER, MALE 3/8", MALE 3/8", O-RING
44	HDW7779	1	FITTING, 90° ELBOW, MALE 1/2", MALE 3/8", O-RING
45	HDW7971	3	FITTING, MALE, QUICK DISCONNECT, 1/4"
46	HDW9459	1	FITTING, 90° ELBOW, MALE 5/8", 0-RING, MALE 3/4"
47	HDW9472	4	UNION, MALE 1/4", MALE 3/8", 0-RING
48	HDW9604	3	ADAPTER, MALE 3/8" X 1/4"
49	9404	2	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 63" LG
50	HDW8975	36	PLUG, SAE #4
51	7484	25	PLUG, SAE #6
	9422	1	HARNESS, MANIFOLD



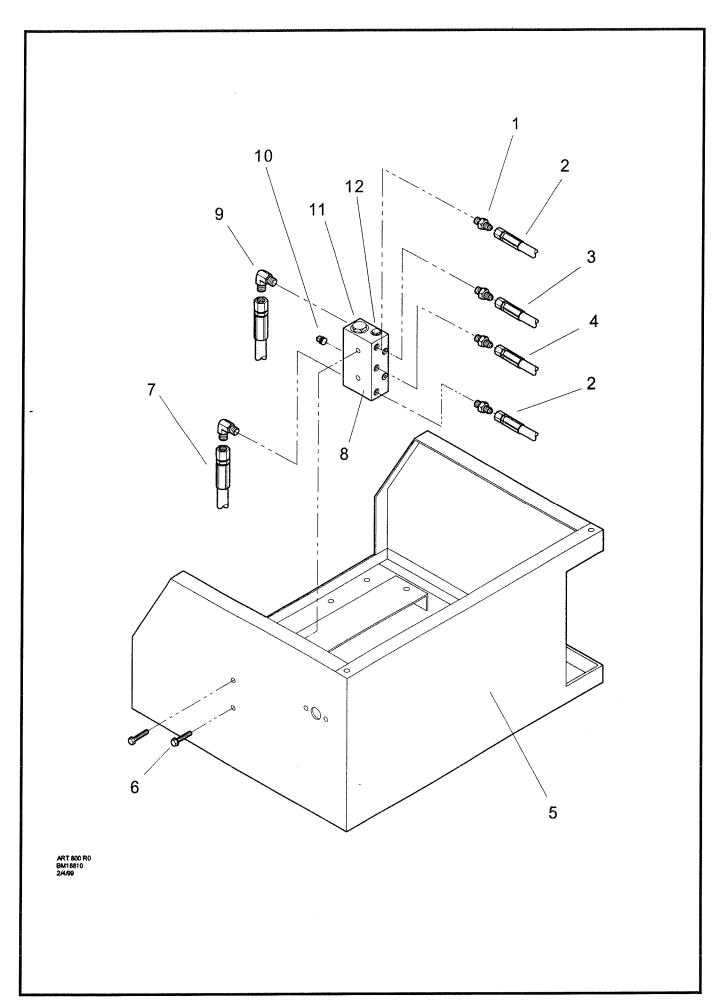
Page 5-18

ITEM	PART NO.	QTY	DESCRIPTION
	20965	-	MAIN MANIFOLD ASSY - WITHOUT OUTRIGGERS, (15 GPM)
			4191RT
1	9657	1	MANIFOLD BLOCK 15 GPM, WITHOUT OUTRIGGERS
2	9504	2	VALVE, CHECK
3	9505	1	VALVE, NEEDLE
4	6975	1	VALVE, N/O SPOOL
5	9663	1	VALVE, RELIEF LIFT BIRET RWA
6	9664 9711	1	VALVE, RELIEF 3 0000 PSI RWP DIFF
7	9665	1	VALVE, MANUAL
8	9666	1	VALVE, PRESSURE REDUCING
9	9667	2	FLOW DIVIDER/COMBINER
10	6973	1	VALVE, N/C POPPET 2 WAY
11	9511	1	VALVE, 2 WAY N/O
12	9512	3	VALVE, 3W2P SPOOL
13	9668	1	VALVE, 4W3P
14	9041	1	VALVE, 4 WAY, 3 POSITION
15	9609	1	VALVE, COUNTERBALANCE
16	9670	1	VALVE, PRESSURE REGULATED
17	9517	1	CARTRIDGE
18	9672	1	COIL-12 VOLT
19	9519	2	COIL-12 VOLT
20	9520	8	COIL-12 VOLT
21	8373	2	VALVE, 4 WAY
22	971T 9664	1	VALVE, RELIEF 1500 PSI DIFF RUD
23	9546	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/4" ID, 34" LG
24	9398	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 96" LG
25	9401	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 28" LG
26	9452	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 20" LG
27	9407	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/8" ID, 220" LG
28	9380	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 66" LG
29	9381	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 151" LG
			(CONT'D)
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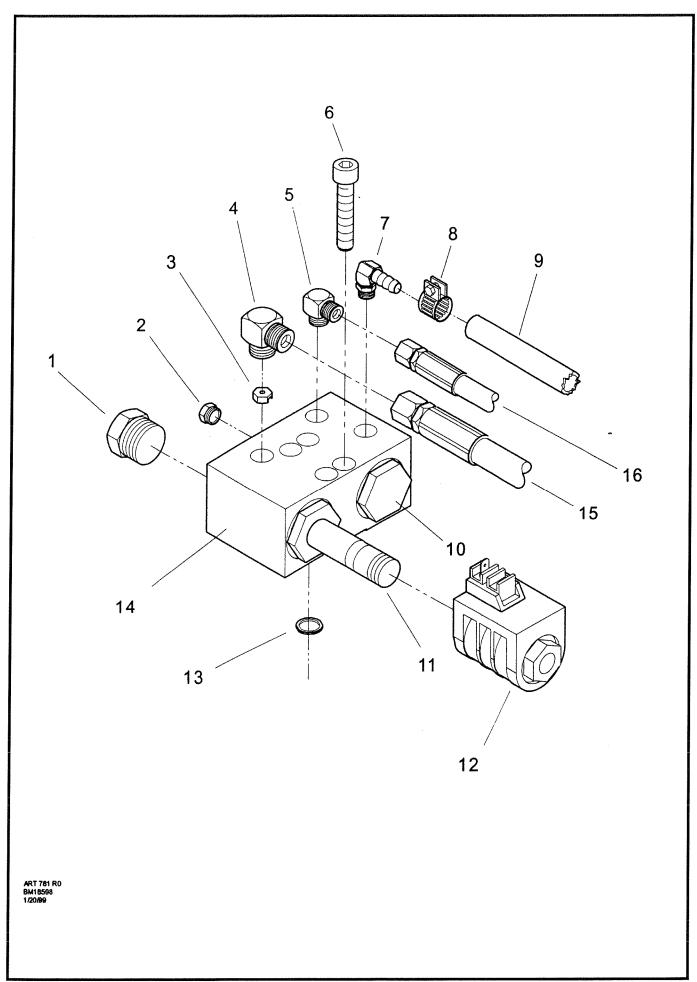


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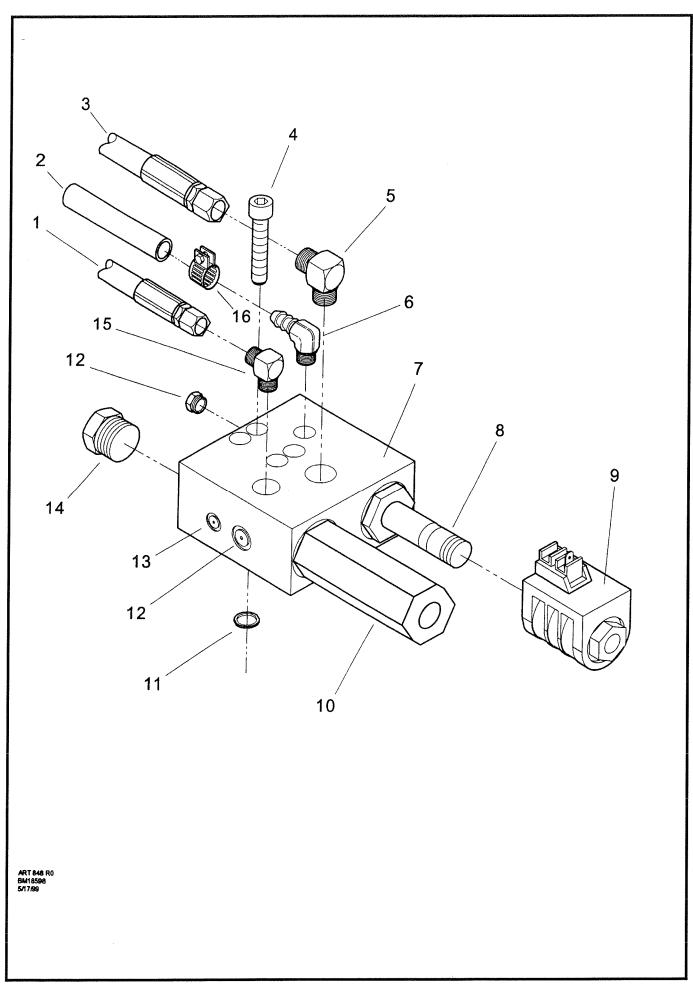
ITEM	PART NO.	QTY	DESCRIPTION
	20965	-	MAIN MANIFOLD ASSY - WITHOUT OUTRIGGERS, (15 GPM)
			4191RT (CONT'D)
30	9383	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 163" LG
31	9385	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 115" LG
32	9387	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 57" LG
33	9388	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 130" LG
34	9389	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 44" LG
35	9390	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 109" LG
36	9391	1 1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/2" ID, 102" LG
37	9392	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 64" LG
38	9393	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 48" LG
39	9394	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 120" LG
40	9584	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/8" ID, 28" LG
41	HDW6725	7	ADAPTER, MALE 1/2", MALE 5/8", O-RING
42	HDW7438	5	ADAPTER, MALE 3/8", MALE 9/16"
43	HDW7600	1	ADAPTER, MALE 3/8", MALE 3/8", O-RING
44	HDW7779	1	FITTING, 90° ELBOW, MALE 1/2", MALE 3/8", O-RING
45	HDW7971	3	FITTING, MALE, QUICK DISCONNECT, 1/4"
46	HDW9459		FITTING, 90° ELBOW, MALE 5/8", O-RING, MALE 3/4"
47	HDW9472	4	UNION, MALE 1/4", MALE 3/8", O-RING
48	HDW9604	3	ADAPTER, MALE 3/8" X 1/4"
49	9399	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 101" LG
50	HDW8975	36	PLUG, SAE #4
51	7484	25	PLUG, SAE #6
	9422	1	HARNESS, MANIFOLD
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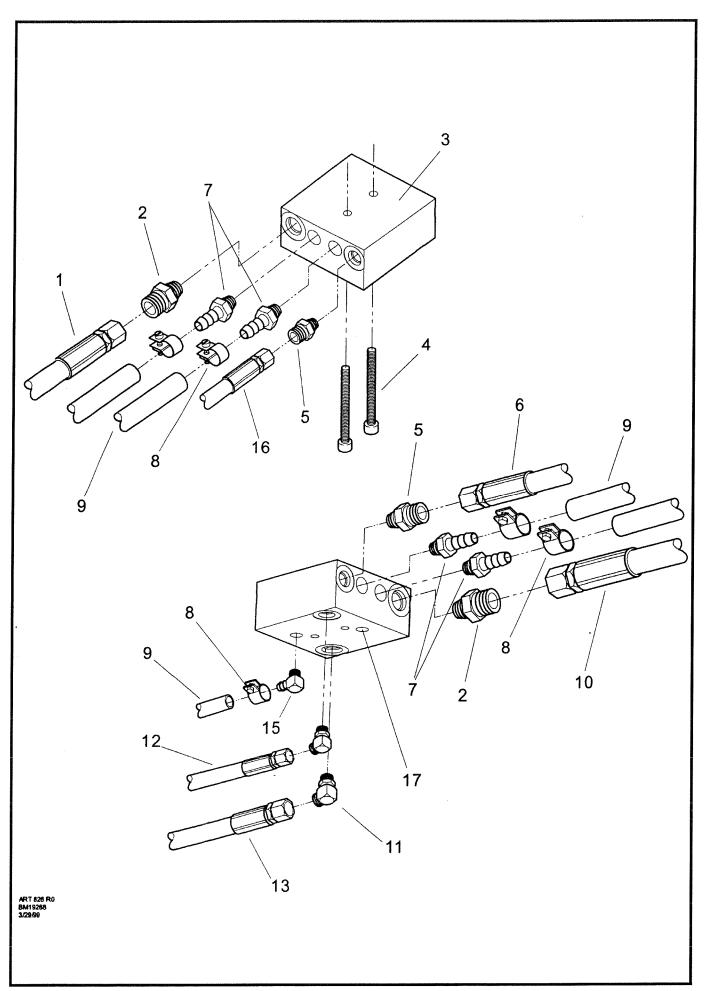
	<u> </u>		
ITEM	PART NO.	QTY	DESCRIPTION
1	HDW7438	4	ADAPTER, MALE 3/8", MALE, 9/16", O-RING
2	9450	2	HOSE ASSY-STRGHT FML, 90° ELBOW, O-R, 1/4" ID, 128" LG
3	9452	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 32" LG
4	9401	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4" ID, 28" LG
5	20447	1	CABINET, MANIFOLD
6	HDW5723	2	SCREW, 1/4" -20, 3/4" LG
7	9451	2	HOSE ASSY-STRGHT FML SWIVEL, ELBOW,
			O-RING, 1/4" ID, 145" LG
8	10278	1	MANIFOLD, AXLE ARTICULATING
9	HDW7601	2	FITTING, ELBOW 90° MALE, MALE, O-RING
10	5368	1	PIPE PLUG
11	7445	2	VALVE, BALL CHECK, PILOT OPERATED
12	HDW7314	3	PLUG, MALE, 43, O-RING
		-	



ITEM	PART NO.	QTY	DESCRIPTION
	20862		MANIFOLD ASSEMBLY, LIFT CYLINDER
1	7484	1	PLUG, O-RING, SOCKET HEAD
2	HDW7314	1	PLUG, PIPE FITTING, MALE, O-RING
3	9554	1	ORIFICE
4	HDW7601	1	FITTING, 90° ELBOW, MALE 3/8", MALE, O-RING
5	HDW8877	1	FITTING, 90° ELBOW, MALE 1/4", MALE, O-RING
6	HDW8592	4	SCREW, 1/4"-20, X 1 1/2" LG
7	HDW8879	1	FITTING, 90° ELBOW, MALE 1/8", HOSE BARB, 5/16"
8	7788	1	HOSE CLAMP, 5/8"
9	6458	20 FT	HOSE, RETURN LINE, 5/16" ID
10	7445	1	VALVE, CHECK
11	6973	1	VALVE, N.C., POPPET, 2 WAY
12	6870	1	COIL, 12 VOLT, 1 SPADE WITH DIODE
13	6426	1	O-RING
14	14523	1	MANIFOLD, BLOCK
15	9523	1	HOSE ASSY-STRGHT FML, STRGHT FML, 3/8"-257" LG
16	9522	1	HOSE ASSY-STRGHT FML, STRGHT FML, 1/4"-259" LG

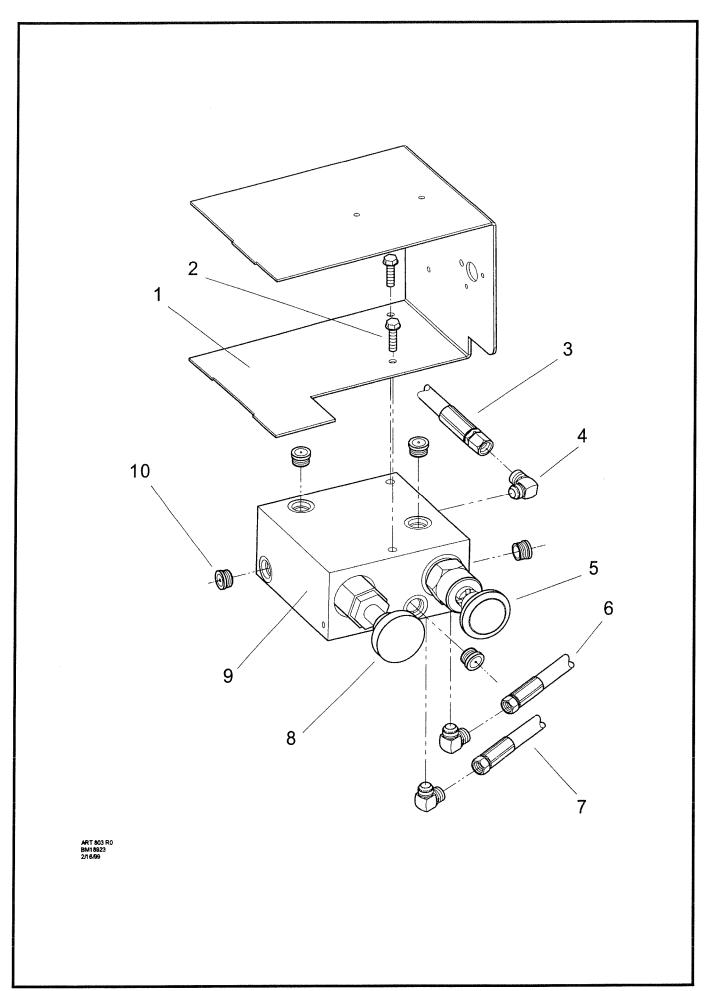


ITEM	PART NO.	QTY	DESCRIPTION
	20595	-	MANIFOLD ASSEMBLY, LIFT CYLINDER
1	6458	25 FT	HOSE, RETURN LINE, 5/16" ID
2	9396	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4"-280" LG
3	9406	1	HOSE ASSY, STRGHT FML, STRGHT FML, 3/8"-280" LG
4	HDW8065	4	SCREW, SOCKET HEAD, 1/4"-20, 2 1/4" LG
5	HDW7601	1	FITTING, 90° ELBOW, MALE, 3/8", MALE, O-RING
6	HDW8879	1	FITTING, 90° ELBOW, MALE, 1/8", HOSE BARB, 5/16"
7	20395	1	MANIFOLD, BLOCK
8	6973	1	VALVE, NC POPPET, 2 WAY
9	6870	1	COIL, 12 VOLT, 1 SPADE WITH DIODE
10	9769	1	VALVE, RELIEF
11	6426	1	O-RING
12	HDW7314	4	PLUG, MALE 43, O-RING
13	HDW8975	1 1	PLUG, MALE 120, O-RING
14	7445	1	VALVE, PILOT OPERATED BALL CHECK
15	HDW8877	1	90° ELBOW, MALE 1/4", O-RING
16	7788	1	HOSE CLAMP, 5/8"



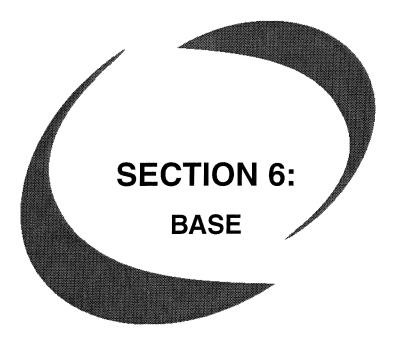
Page 5-28

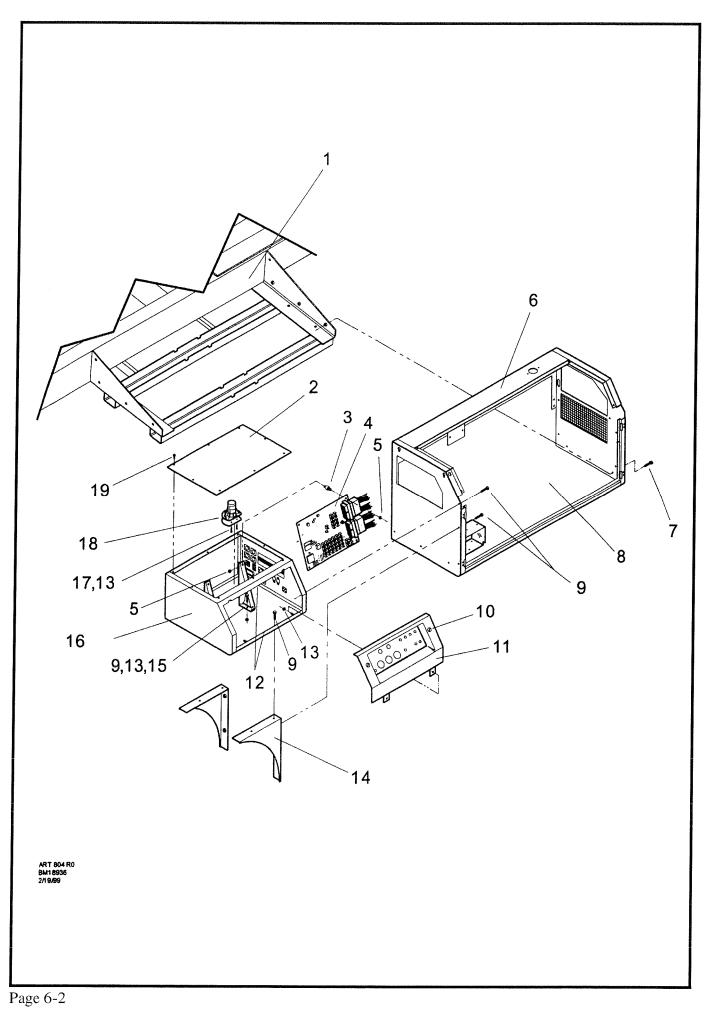
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ITEM	PART NO.	QTY	
4	0400	4	JUNCTION BLOCK ASSY-LIFT CYLINDERS - 4191RT
1	9406	1	HOSE ASSY, STRGHT FML, STRGHT FML, 3/8"-280" LG
2	HDW7438	2	ADAPTER, MALE, 3/8", MALE 9/16"
3	20588	1	MANIFOLD BLOCK, JUNCTION
4	HDW9758	2	SCREW, 1/4"-20, 2" LG
5	HDW8881	2	ADAPTER, MALE 1/4" O-RING, MALE 1/4"
6	9397	1-	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4"-221" LG
7	HDW6459	4	UNION, MALE 1/4", HOSE BARB 5/16"
8	HDW7788	5	CLAMP, HOSE
9	6458	5	HOSE, RETURN LINE
10	9407	1	HOSE ASSY, STRGHT FML, STRGHT FML, 3/8"-220" LG
11	HDW8877	1	ELBOW 90°, MALE 1/4" O-RING, MALE 1/4"
12	9395	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4"-38" LG
13	9031	1	HOSE ASSY-LIFT, STRGHT FML, STRGHT FML, 3/8"-36" LG
14	HDW7601	1	ELBOW 90°, MALE 3/8", MALE 3/8" O-RING
15	HDW8879	1	ELBOW 90°, MALE 1/8", HOSE BARB 5/16"
16	9396	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4"-280" LG
17	6423	1	PLUG (IF PRESENT)
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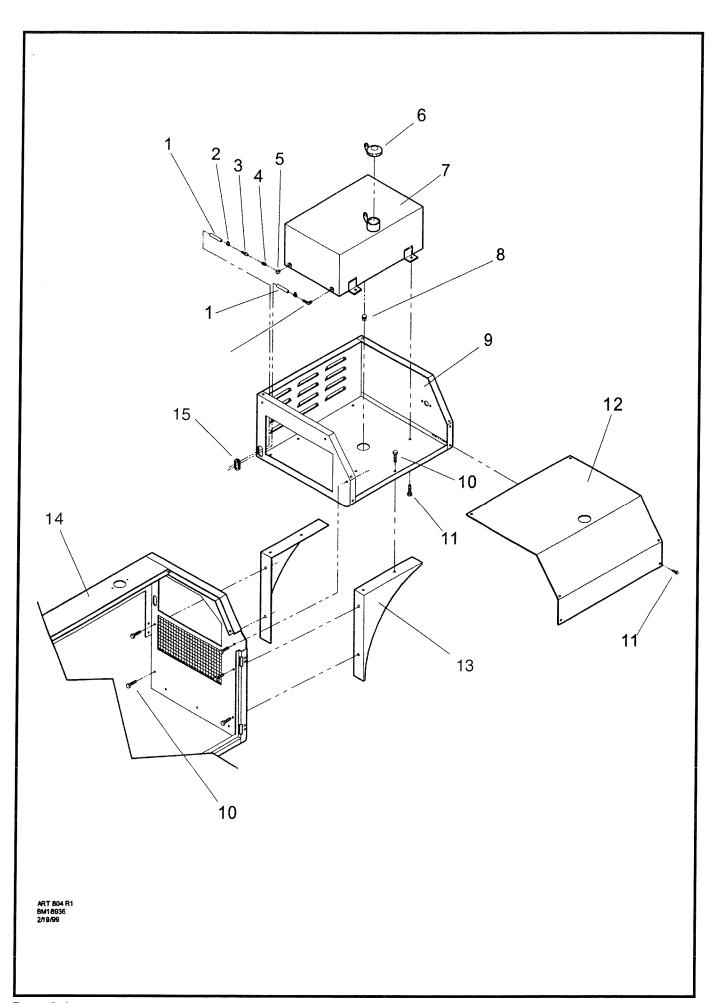
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ITEM	PART NO.	QTY	DESCRIPTION
	20601	1	EMERGENCY DOWN MANIFOLD ASSEMBLY
1	20717	1	BRACKET
2	HDW6455	2	SCREW, 1/4"-20, 112" LG
3	9476	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 83" LG
4	HDW8877	3	90° ELBOW, MALE 1/4" O-RING, MALE 1/4"
5	8848	1	VALVE, MANUAL PULL
6	9394	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 120" LG
7	9522	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 259" LG
8	8849	1	VALVE, HAND PUMP
9	20437	1	MANIFOLD BLOCK
10	HDW8975	5	PLUG, MALE, 1/8" O-RING
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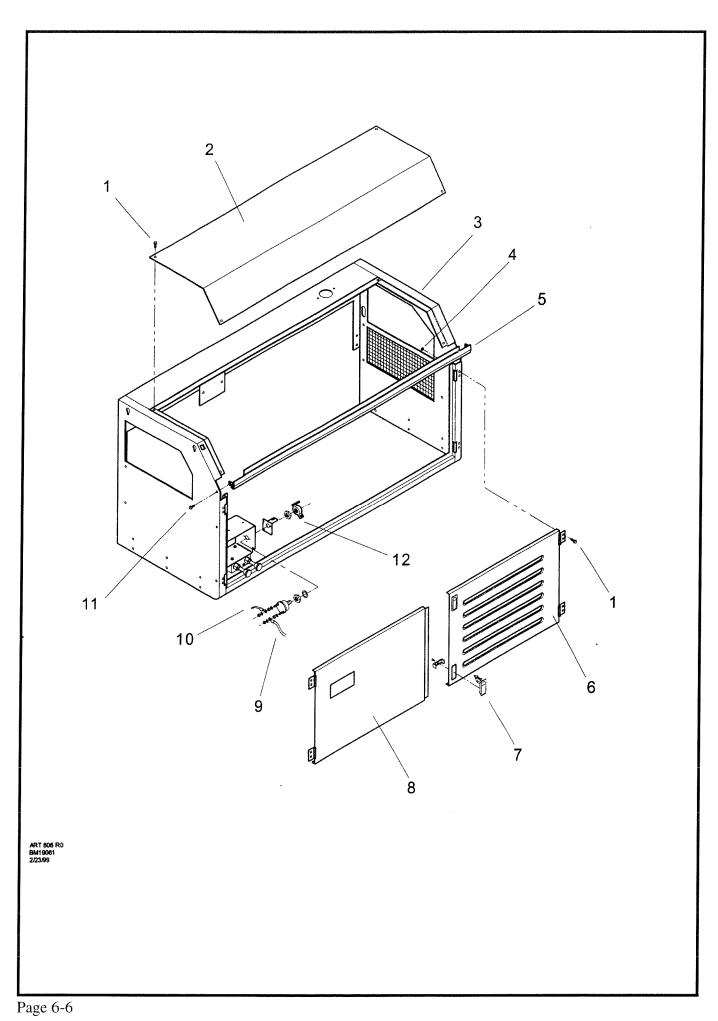
ITEM	PART NO.	QTY	DESCRIPTION	
1	20892	1	BASE WELDMENT - 4191RT	
	20409	1	BASE WELDMENT - 2591RT, 3391RT	
2	20441	1	PANEL, TOP	
3	9466	4	MOUNT, VIBRATION, CIRCUIT BOARD	
4	9500	1	BOARD, LOWER CONTROL	
5	HDW7543	4	NUT #10-32	
6	20380	1	CABINET, ENGINE	
7	HDW5204	6	SCREW, 5/16"- 18, 1" LG	
8	20659	1	PLATE ENGINE MOUNT	
9	HDW5723	15	SCREW, 1/4"-20, 3/4" LG	
10	9419	2	LATCH	
11	20660	1	COVER, FRONT CONTROL PANEL	
12	9454	2	GASKET, 1/2" WIDE, 1/8" THICK	
13	HDW5276	6	NUT, 1/4"-20	
14	20661	2	GUSSET, RADIUS FENDER	
15	20841	2	BRACKET, CIRCUIT BOARD MOUNT	
16	20560	1	CABINET,CORNER	
17	HDW9464	4	SCREW, 1/4"-20, 3/4" LG	
18	9493	1	SENSOR, TILT, 4.5° 90160 (40)	
	9494	1	SENSOB, TILL 2° (EUBORE)	
19	HDW6455	8	SCREW, 1/4"-20, 1/2" LG	
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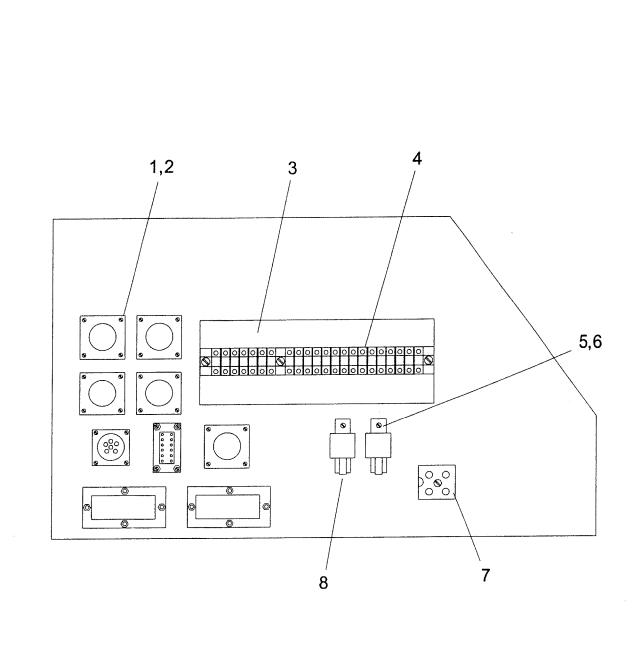
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ITEM 1	PART NO. 7852	QTY	
ı		2	HOSE, FUEL LINE, 3/16" ID
2	7788	2	CLAMP, HOSE
3	HDW7746	1	UNION, FML 1/8", HOSE BARB 3/16"
4	HDW7509	1	UNION, MALE 1/8"
5	6863	1	ELBOW, MALE 1/8"
6	6978	1	CAP, GAS
7	9355	1	TANK, FUEL - 17 GALLON
8	5442	1	PLUG, PIPE, 3/8" NPT
9	20557	1	CABINET, GAS TANK
10	HDW5723	11	SCREW, 1/4"-20, 3/4" LG
11	HDW6455	10	SCREW, 1/4"-20, 1/2" LG
12	20553	1	COVER, GAS TANK CABINET
13	20661	2	GUSSET, RADIUS FENDER
14	20380	1	CABINET, ENGINE
15	5863	1	GROMMET, 3/16" X 1 1/2" X 1 3/4"
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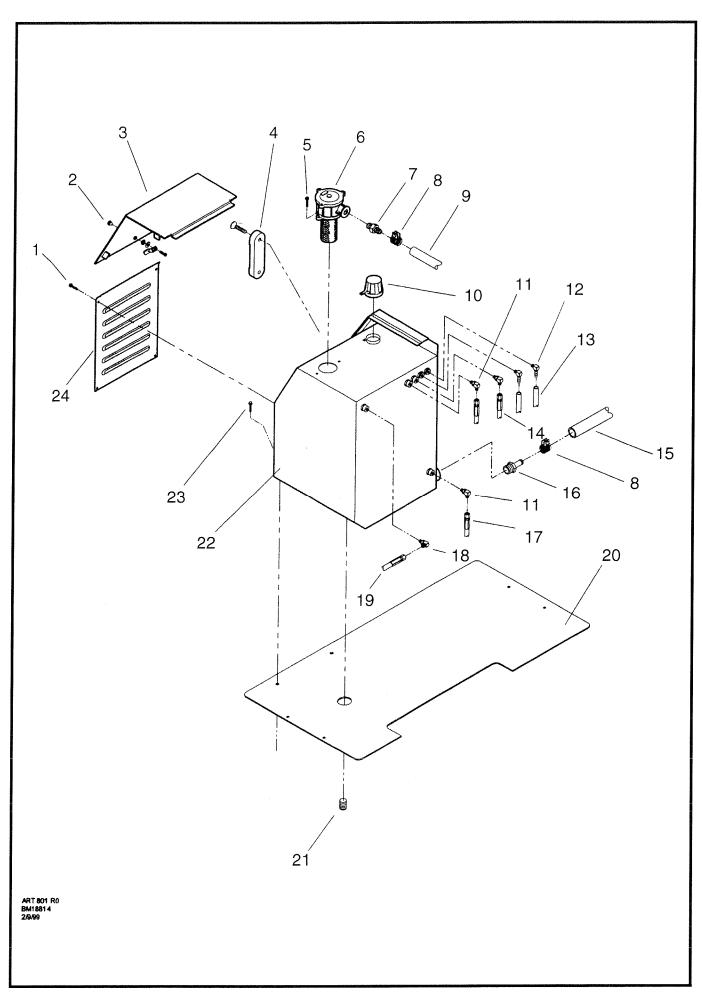


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ITEM	PART NO.	QTY	
	HDW9464	12	SCREW, 1/4"-20, 3/4" LG
2	20458	1	COVER, ENGINE CABINET
3	20380	1	CABINET, ENGINE
4	HDW5276	8	NUT, 1/4"-20
5	20391	1	PANEL, MID-CABINET SUPPORT
6	20667	1	DOOR, RIGHT
7	8386	2	LATCH, TRIGGER, FLUSH
8	20668	1	DOOR, LEFT
9	9062	1	CABLE, BATTERY, RED, 48" LG TO ENGINE
10	9438	1	CABLE, BATTERY, RED, 15" LG TO BATTERY
11	HDW5723	2	SCREW, 1/4"-20, 3/4" LG (SELF-TAP)
12	8841	1	SWITCH, MASTER DISCONNECT
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	- POTO -		

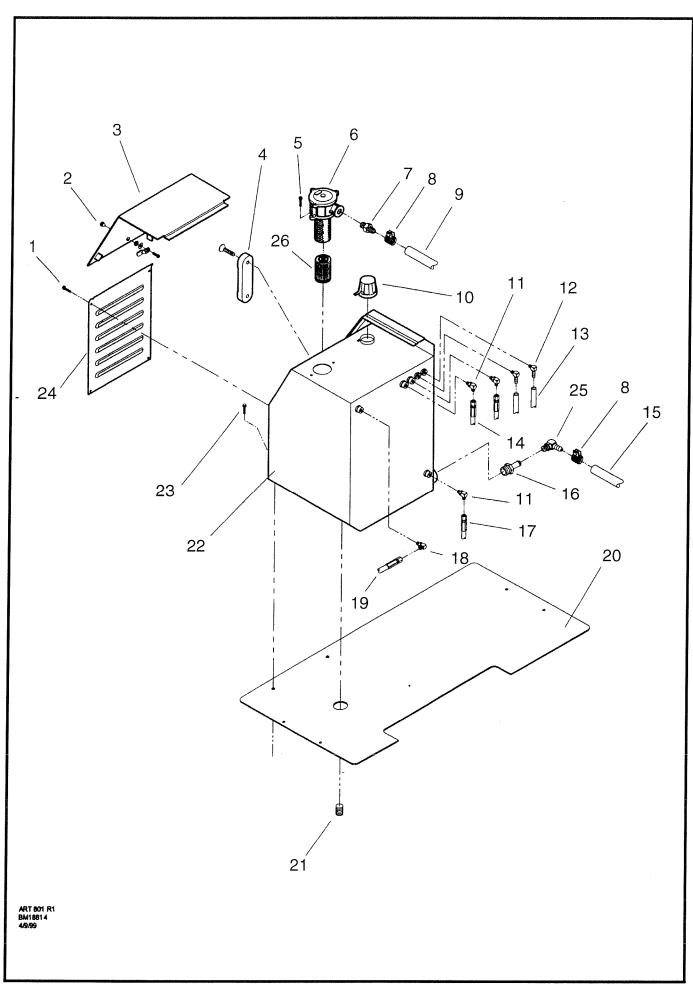


ART 827 R0 BM19301 3/22/99

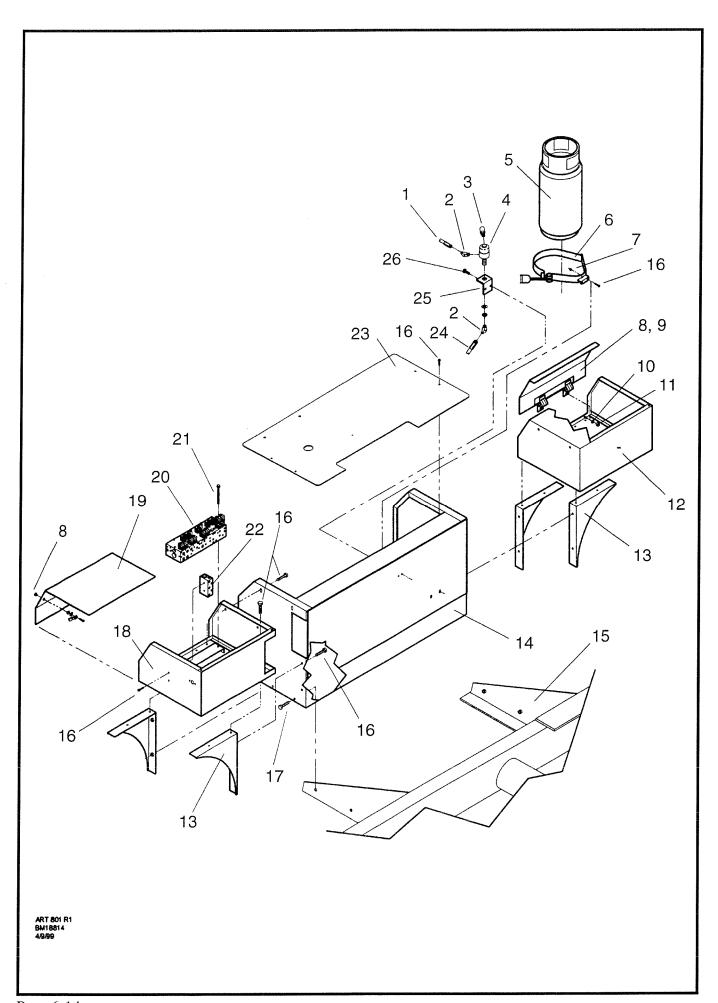
ITEM	PART NO.	QTY	DESCRIPTION
1	HDW7561	40	SCREW, #6-32, 3/4" LG
2	HDW5364	40	NUT, #6-32
3	7970	1	MARKER, STRIP, 1-22
4	6947	1	TERMINAL STRIP
5	HDW5276	2	NUT, 1/4"-20, - DIESEL
	HDW5276	1	NUT, 1/4"-20, - DUAL FUEL
6	HDW5723	2	SCREW, 1/4"-20, 3/4" LG - DIESEL
	HDW5723	1	SCREW, 1/4"-20, 3/4" LG - DUAL FUEL
7	7492	1	BLOCK, TERMINAL
8	9278	2	RELAY, 12 VOLT, N/O W/SUPPRESSION - DIESEL
	9278	1	RELAY, 12 VOLT, N/O W/SUPPRESSION - DUAL FUEL
	- VOE.		



ITEM	PART NO.	QTY	DESCRIPTION
1	HDW6455	4	SCREW, 1/4"-20, 1/2" LG
2	9419	1	LATCH
3	20534	1	COVER, HYD TANK
4	9370	1	GAUGE, HYD TANK
5	HDW5724	1	SCREW, 5/16"-18, 3/4" LG
6	9368	1	FILTER, TANK MOUNTED RETURN
7	HDW9460	1	MALE, 3/4" O-RING, MALE 3/4"
8	8064	2	CLAMP, HOSE, 1 3/4" MAXIMUM
9	9546	1	HOSE ASSY, STRGHT FML, STRGHT FML, 3/4" ID, 44" LG
10	9367	1	FILLER, WITH STRAINER
11	HDW8877	3	ELBOW, MALE 1/4" O-RING, MALE, 1/4"
12	HDW6727	2	90° ELBOW, MALE 5/16", MALE, HOSE BARB, 1/4"
13	6458	2	HOSE, RETURN LINE
14	9393	2	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 48" LG
15	9496	1	HOSE, 1" ID X 82" LG-LOW PRESSURE
16	9542	1	STRAINER, SUCTION, SAE #24
17	9476	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 83" LG
18	HDW7601	1	90° ELBOW, MALE, 3/8", MALE 3/8" O-RING
19	9584	1	HOSE ASSY, STRGHT FML, STRGHT FML, 3/8" ID, 24" LG
20	20455	1	FLOOR PAN
21	5442	1	PLUG, PIPE, 3/8"
22	20477	1	TANK, HYD, 30 GALLON
23	HDW5204	3	SCREW, 5/16"-18, 1" LG
24	20527	1	PANEL, FRONT
	1		

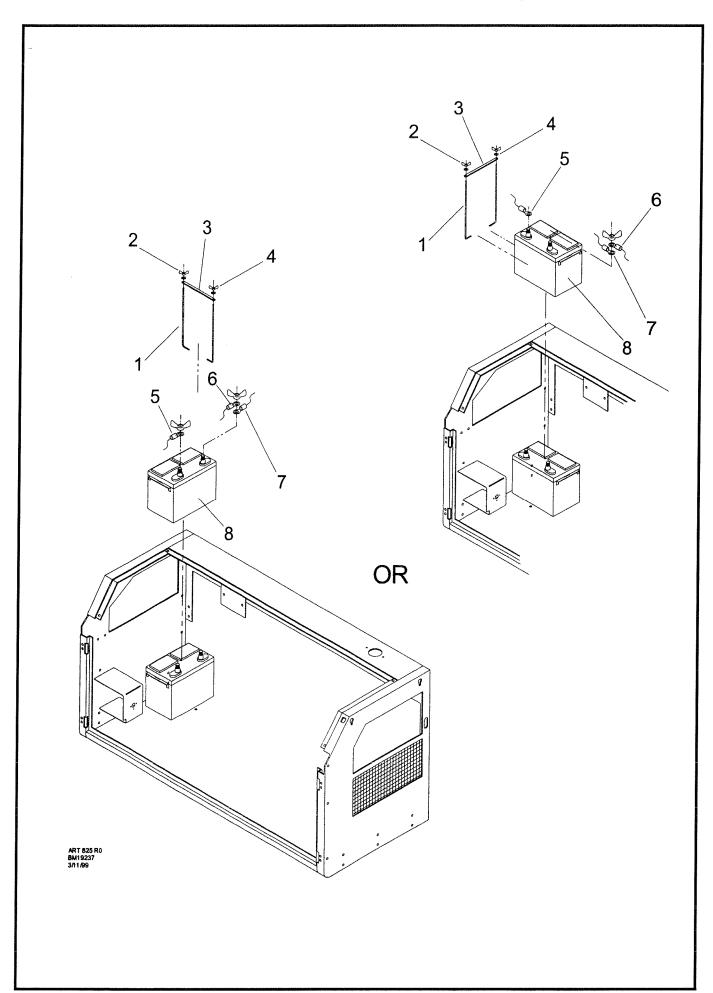


ITEM	PART NO.	QTY	DESCRIPTION
1	HDW6455	4	SCREW, 1/4"-20, 1/2" LG
2	9419	1	LATCH
3	20534	1	COVER, HYD TANK
4	9370	1	GAUGE, HYD TANK
5	HDW5724	1	SCREW, 5/16"-18, 3/4" LG
6	9368	1	FILTER, RETURN, TANK MOUNTED
7	HDW9460	1	FITTING, MALE, 3/4" O-RING, MALE 3/4"
8	8064	2	CLAMP, HOSE, 1 3/4" MAXIMUM
9	9546	1	HOSE ASSY, STRGHT FML, STRGHT FML, 3/4" ID, 44" LG
10	9367	1	FILLER, WITH STRAINER
11	HDW8877	3	ELBOW, MALE 1/4" O-RING, MALE, 1/4"
12	HDW6727	2	90° ELBOW, MALE 5/16", MALE, HOSE BARB, 1/4"
13	6458	2	HOSE, RETURN LINE
14	9393	2	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 48" LG
15	9496	1	HOSE, 1" ID X 82" LG-LOW PRESSURE
16	9542	1	STRAINER, SUCTION, SAE #24 (2591RT & 3391RT)
	9733	1	STRAINER, SUCTION, SAE #32 (4191RT)
17	9476	1	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 83" LG
18	HDW76OI	1	FITTING, 90° ELBOW, MALE, 3/8", MALE 3/8" O-RING
19	9584	1	HOSE ASSY, STRGHT FML, STRGHT FML, 3/8" ID, 24" LG
'20	20455	1	FLOOR PAN-HYD TANK
21	5442	1	PLUG, PIPE, 3/8"
22	20906	1	TANK, HYD, 33 GALLON (4191RT)
	20979	1	TANK, HYD, 32 GALLON (2591RT & 3391RT)
23	HDW5204	3	SCREW, 5/16"-18, 1" LG
24	20527	1	PANEL, FRONT, HYD TANK
25	HDW9732	1	90° ELBOW, MALE, SAE #24, MALE 1 1/2"
			HOSE BARB (4191RT ONLY)
26	9915	1	FILTER, HYD, 10 MICRON



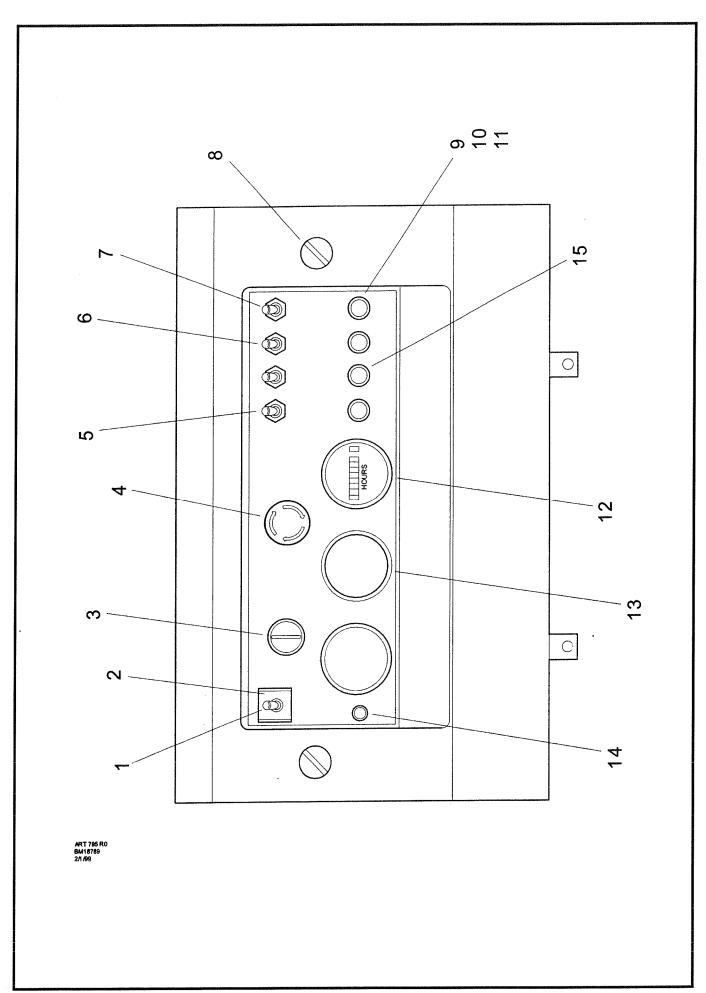
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	QTY	DESCRIPTION
6890	1	HOSE ASSY, 45° FLARE, SWIVEL, 3/8"
HDW6895	2	45° ELBOW, MALE 3/8", MALE 1/4"
6938	1	VALVE, RELIEF, LP GAS
6861	1	FILTER, BULKHEAD
6859	1	TANK, PROPANE
6860	1	BRACKET, LPG TANK MOUNTING
HDW5005	2	NUT, 5/16"-18
9419	3	LATCH, CABINET
20665	1	DOOR, TOOLBOX
HDW5006	2	WASHER, SPLIT
HDW5276	2	NUT,1/4"-20
20566	1	CABINET, TOOL BOX
20661	4	GUSSET, FENDER
20375	1	CABINET, HYD
20892	1	BASE WELDMENT
HDW5723	22	SCREW, 1/4"-20, 3/4" LG
HDW5204	12	SCREW, 5/16"-18, 1" LG
20447	1	CABINET, MANIFOLD
20459	1	COVER, MANIFOLD CABINET
27/2-27		MAIN MANIFOLD ASSEMBLIES
20669	1	WITH OUTRIGGERS, 2591RT & 3391RT
20696	1	WITHOUT OUTRIGGERS, 2591RT & 3391RT
20965	1	WITHOUT OUTRIGGERS, 4191RT
20966	1	WITH OUTRIGGERS, 4191RT
HDW9619	2	SCREW, 5/16"-18, 4 1/2" LG
20635	1	MANIFOLD, PIVOT AXLE
20455	1	FLOOR PAN
'406	1	HOSE ASSY, LP GAS, 5/8"-18, FML SWVEL, 3/8" ID, 90" LG
20840	1	BRACKET, LP REGULATOR MOUNT
HDW6455	2	SCREW, 1/4"-20, 1/2" LG
707	2	PLUG, PLASTIC, 5/8" (NOT SHOWN)
709	4	PLUG, PLASTIC, 5/16" (NOT SHOWN)
- International Property of the Inte		
	HDW6895 6938 6861 6859 6860 HDW5005 6419 20665 HDW5006 HDW5276 20566 20661 20375 20892 HDW5723 HDW5723 HDW5204 20447 20459 20669 20669 20669 20669 20669 20666 HDW9619 20635 20455 20406 10840 HDW6455 707	HDW6895 2 6938 1 6861 1 6859 1 6860 1 HDW5005 2 6419 3 60665 1 HDW5006 2 HDW5276 2 60566 1 60661 4 60375 1 60892 1 HDW5723 22 HDW5204 12 60447 1 60459 1 60696 1 HDW9619 2 60635 1 60455 1 60635 1 60455 1 60455 1 60840 1 HDW6455 2 707 2

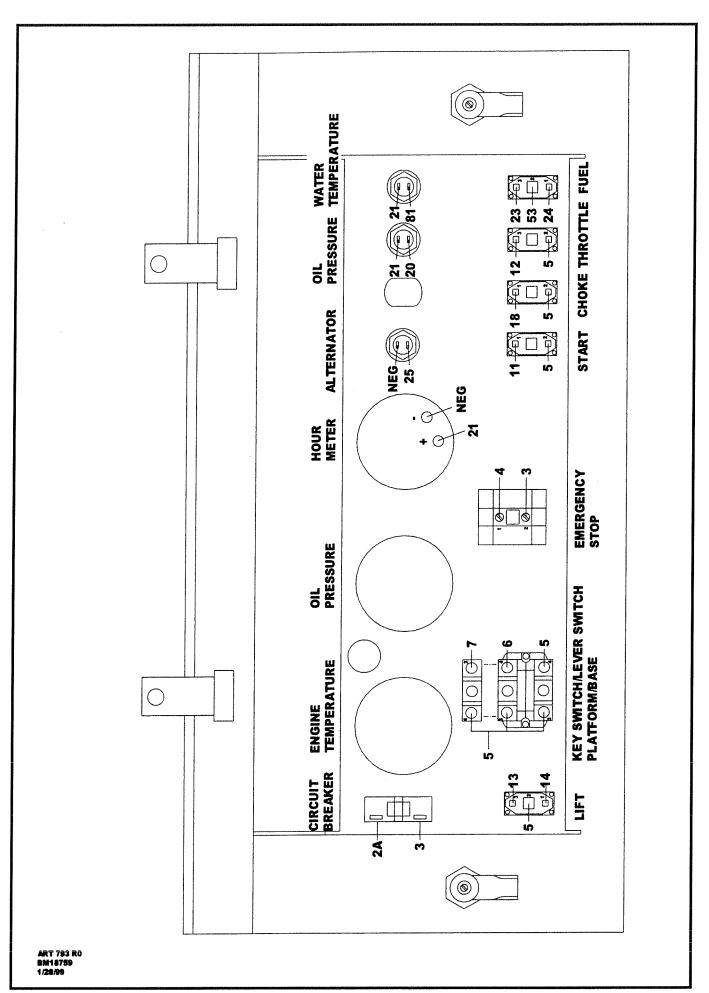


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1 2987 2 ROD, HOLD DOWN 2 HDW6110 2 NUT, WING 1/4"- 20 3 3436 1 BAR, HOLD DOWN 4 HDW5217 2 WASHER, FLAT 5 9438 1 CABLE, BATTERY, UL1283-#2 RED, 15" LG 6 9439 1 CABLE, BATTERY, UL1283-#6 BLACK, 30" LG 7 7513 1 CABLE, BATTERY, UL1283-#6 BLACK, 24" LG 8 6854 1 BATTERY, 12 VOLT STARTER 8 135 1 BOOT, TERMINAL-BLACK (NOT SHOWN) 8 136 1 BOOT, TERMINAL-RED (NOT SHOWN)	ITEM	PART NO.	QTY	DESCRIPTION
2 HDW6110 2 NUT, WING 1/4"- 20 3 3436 1 BAR, HOLD DOWN 4 HDW5217 2 WASHER, FLAT 5 9438 1 CABLE, BATTERY, UL1283- #2 RED, 15" LG 6 9439 1 CABLE, BATTERY, UL1283 - #2 BLACK, 30" LG 7 7513 1 CABLE, BATTERY, UL1283- #6 BLACK, 24" LG 8 6854 1 BATTERY, 12 VOLT STARTER 8135 1 BOOT, TERMINAL-BLACK (NOT SHOWN)			~	
3 3436 1 BAR, HOLD DOWN 4 HDW5217 2 WASHER, FLAT 5 9438 1 CABLE, BATTERY, UL1283- #2 RED, 15" LG 6 9439 1 CABLE, BATTERY, UL1283 - #2 BLACK, 30" LG 7 7513 1 CABLE, BATTERY, UL1283- #6 BLACK, 24" LG 8 6854 1 BATTERY, 12 VOLT STARTER 8135 1 BOOT, TERMINAL-BLACK (NOT SHOWN)	2	HDW6110	2	
4 HDW5217 2 WASHER, FLAT 5 9438 1 CABLE, BATTERY, UL1283- #2 RED, 15" LG 6 9439 1 CABLE, BATTERY, UL1283 - #2 BLACK, 30" LG 7 7513 1 CABLE, BATTERY, UL1283- #6 BLACK, 24" LG 8 6854 1 BATTERY, 12 VOLT STARTER 8135 1 BOOT, TERMINAL-BLACK (NOT SHOWN)	3	3436	1	
5 9438 1 CABLE, BATTERY, UL1283- #2 RED, 15" LG 6 9439 1 CABLE, BATTERY, UL1283 - #2 BLACK, 30" LG 7 7513 1 CABLE, BATTERY, UL1283- #6 BLACK, 24" LG 8 6854 1 BATTERY, 12 VOLT STARTER 8135 1 BOOT, TERMINAL-BLACK (NOT SHOWN)	4	HDW5217	2	
6 9439 1 CABLE, BATTERY, UL1283 - #2 BLACK, 30" LG 7 7513 1 CABLE, BATTERY, UL1283 - #6 BLACK, 24" LG 8 6854 1 BATTERY, 12 VOLT STARTER 8135 1 BOOT, TERMINAL-BLACK (NOT SHOWN)	5	9438	1	
7 7513 1 CABLE, BATTERY, UL1283- #6 BLACK, 24" LG 8 6854 1 BATTERY, 12 VOLT STARTER 8135 1 BOOT, TERMINAL-BLACK (NOT SHOWN)	6	9439	1	
8 6854 1 BATTERY, 12 VOLT STARTER 8135 1 BOOT, TERMINAL-BLACK (NOT SHOWN)	7	7513	1	
8135 1 BOOT, TERMINAL-BLACK (NOT SHOWN)	8	6854	1	
		8135	1	
		8136	1	
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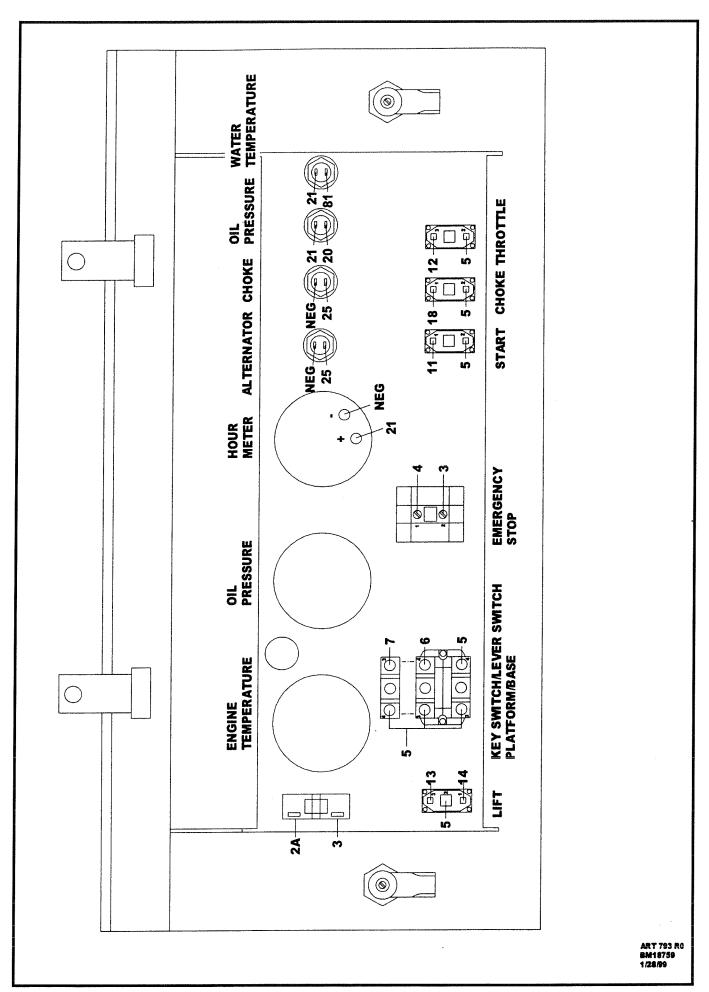


ITEM	PART NO.	QTY	DESCRIPTION
1	5230	1	TOGGLE SWITCH, 3 POSITION, MOMENTARY, CENTER OFF
2	1313	1	GUARD, SWITCH
3	9690	1	TUMBLER, LEVER SWITCH, 3 POSITION
	9549	1	TUMBLER, KEY SWITCH
4	7800	4	SWITCH, EMERGENCY STOP
5	7423	2	TOGGLE SWITCH, 2 POSITION MOMENTARY
6	5630	1-	TOGGLE SWITCH, 2 POSITION, MAINTAINED
7	6234	1	TOGGLE SWITCH, 2 POSITION, MAINTAINED
8	9419	2	LATCH, CABINET
9	9179	3	LIGHT SOCKET
10	9183	3	LENS, RED
11	9188	3	LIGHT, BAYONET
12	6857	1	HOUR METER
13	7115	2	PLUG, HOLE
14	9477	1	CIRCUIT BREAKER-20 AMP
15	9184	1	LENS, YELLOW-DIESEL ONLY



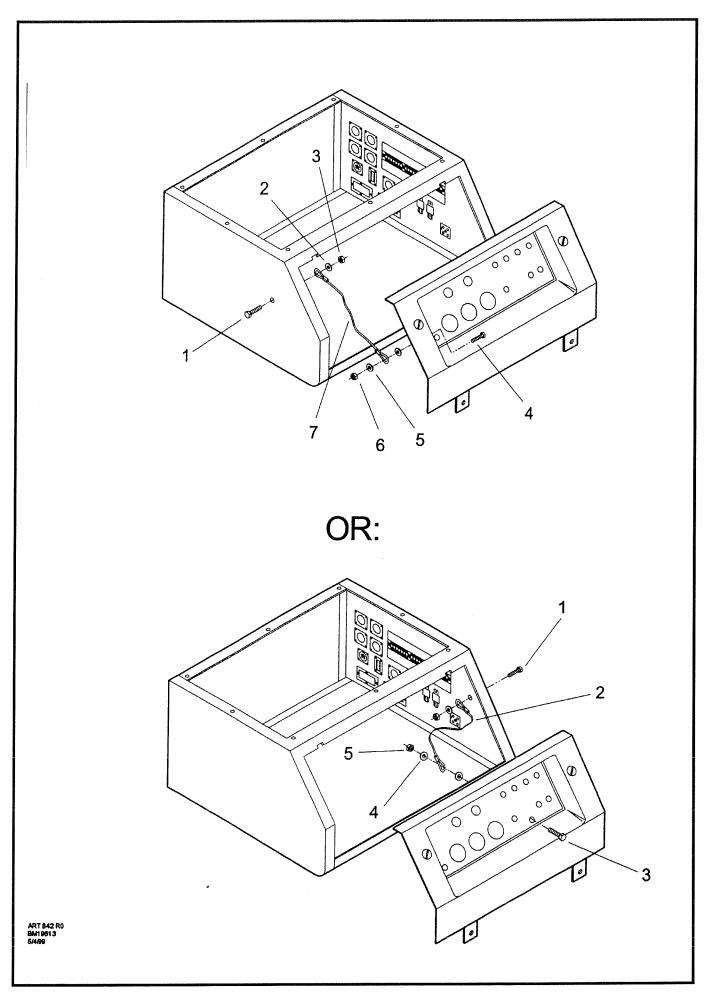
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ITEM	PART NO.	QTY	DESCRIPTION
	9428	1	WIRE HARNESS, CONTROL PANEL, DUAL FUEL
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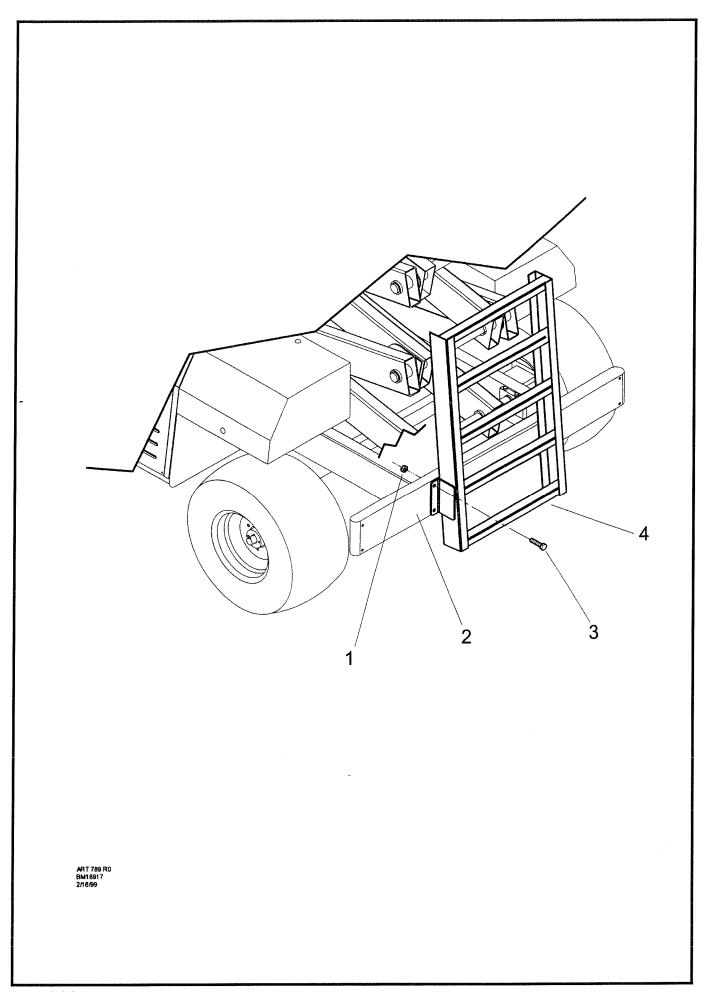


ITEM	PART NO.	QTY	DESCRIPTION
	9640	1	WIRE HARNESS, CONTROL PANEL, DIESEL

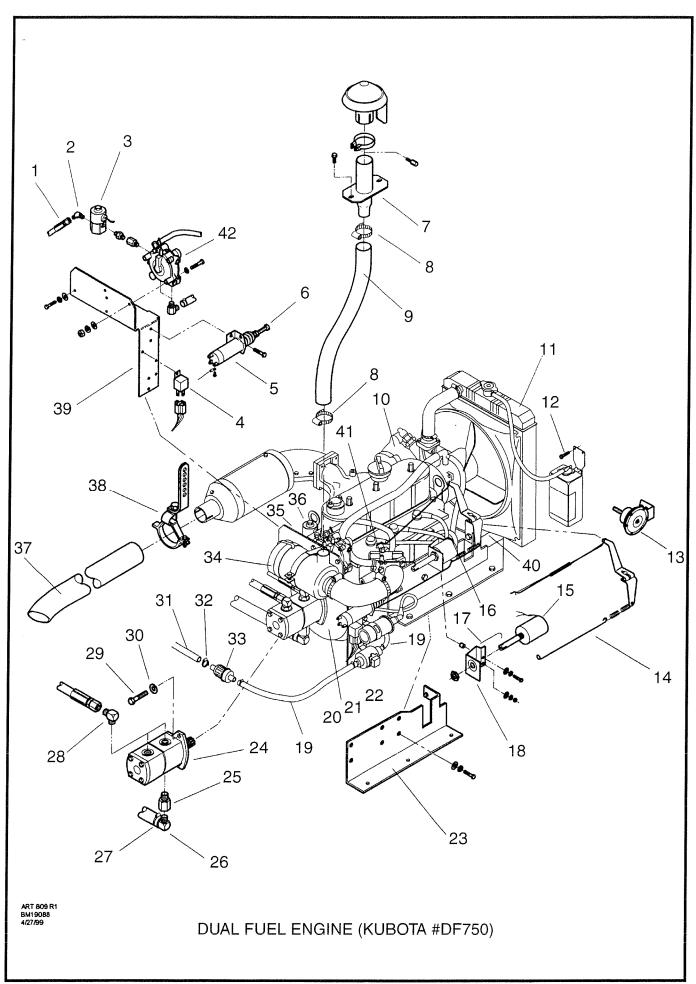
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ITEM	PART NO.	QTY	
1	HDW6455	1	SCREW, 1/4"-20, 1/2" LG
2	HDW8552	1	WASHER, FLAT
3	HDW5276	1	NUT, 1/4"-20
4	HDW6846	1	SCREW, #8-32, 1" LG
5	HDW4773	2	WASHER, FLAT
6	HDW5251	1	NUT, #8-32
7	9861	1	LANYARD, 18"
			OR
1	HDW5723	1 1	SCREW, 1/4"- 20, 3/4" LG (EXISTS ON CABINET)
2	9771	1	LANYARD, 12"
3	HDW5904	1 1	SCREW, 1/4"- 20, 3/4" LG
4	HDW5217	3	WASHER,FLAT
5	HDW6461	2	NUT, 1/4"- 20

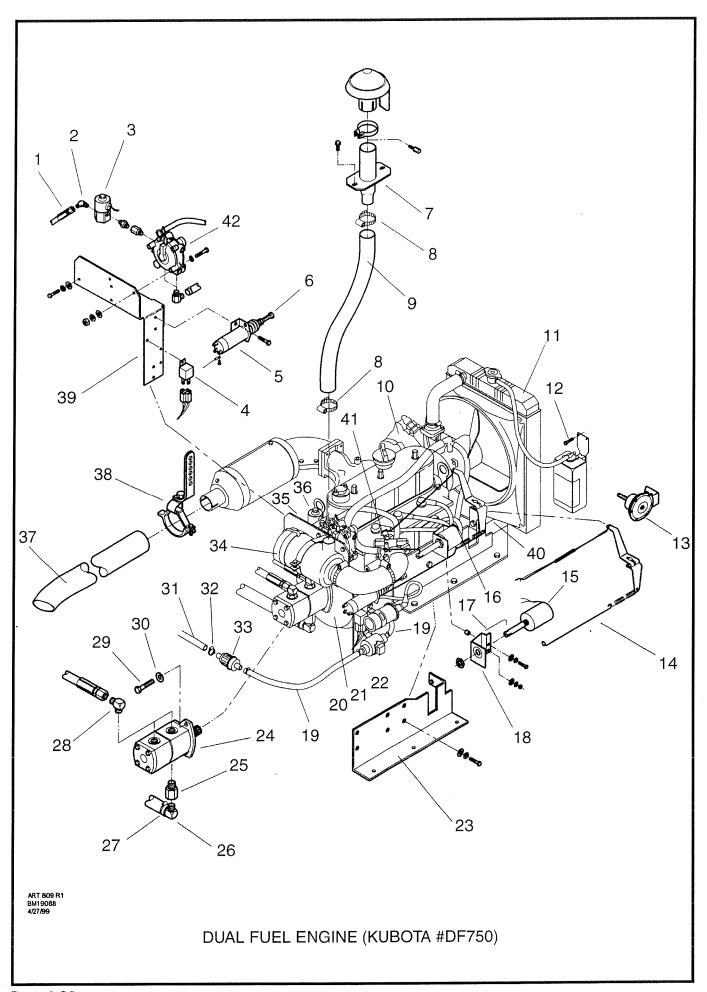


ITEM	PART NO.	QTY	DESCRIPTION
1	HDW6463	4	NUT, 1/2"-13
2	20409	REF	BASE WELDMENT - 3391RT & 2591RT
 	20409	REF	BASE WELDMENT - 4191RT
,	HDW7312		
3		4	SCREW, 1/2"-13, 4 1/2" LG
4	20317	1	LADDER WELDMENT - 4191RT
	20539	1	LADDER WELDMENT - 3391RT
	20535	1	LADDER WELDMENT - 2591RT
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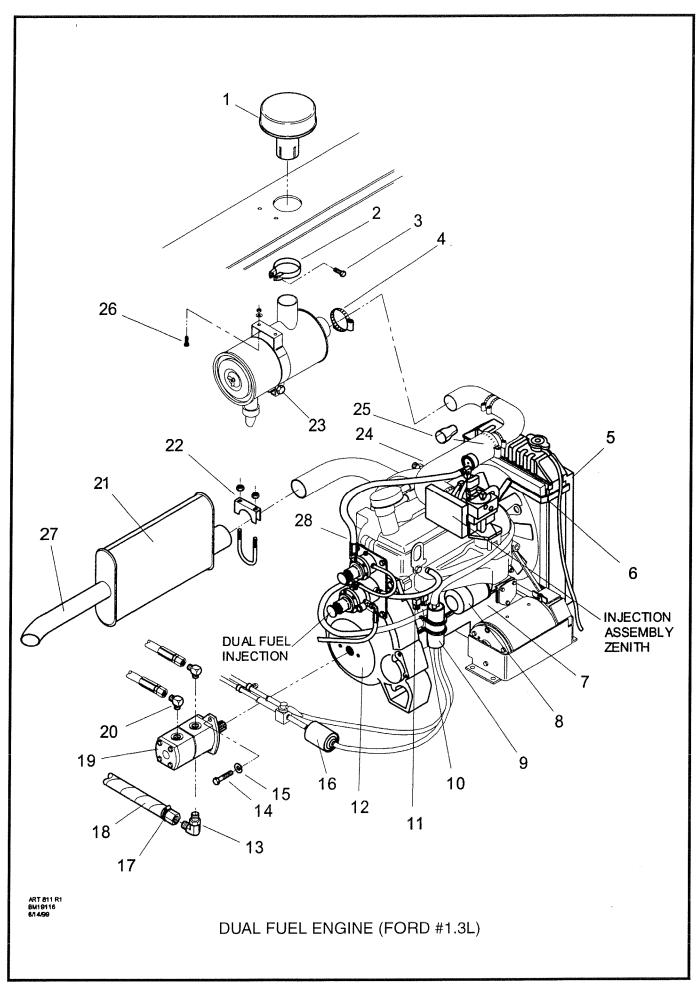
ITEM	PART NO.	QTY	DESCRIPTION
1	7406	1	HOSE ASSY-LP GAS-5/8"-18 FML SWIVEL, 3/8" ID, 90" LG
2	HDW6895	1	45° ELBOW, MALE 3/8"-45°, MALE 1/4"
3	6867	1	VALVE, LOCK OFF
4	9278	1	RELAY, 12 VOLT, N/O WITH SUPPRESSION
5	9402	1	SOLENOID, 12 VDC, 9 LB PULL
6	HDW9247	1	SCREW, 1/4"-28, 1" LG
7	20208	1	AIR, INTAKE
8	7545	2	CLAMP, HOSE, #28-2 1/4"
9	9260	2 FT	HOSE, 1.7 ID X 26" LG, FLEXIBLE
10	9024	1	DYNAMO
11	8472	1	RADIATOR
12	HDW5723	2	SCREW, 1/4"- 20, 3/4" LG
13	9482	1	HORN, 12 VOLT
14	9252	1	THROTTLE LINKAGE
15	9502	1	SOLENOID, TUBULAR-GUARDIAN
16	20204	1	SPACER
17	9498	1	CHOKE LINKAGE
18	20212	1	BRACKET, CHOKE SOLENOID
19	7852	2	HOSE, FUEL LINE, 3/16" ID
20	9648	1	HOUSING, PUMP
21	9650	1	DRIVE HUB, 3/4" SHAFT PUMP
22	9651	1	KIT, HARDWARE, DUAL FUEL 750 PUMP
23	20960	1	BRACKET, ENGINE MOUNT, DF 750-LH
	20961	1	BRACKET, ENGINE MOUNT, DF 750-RH
24	7318	1	PUMP, HYD
25	HDW8562	1	ADAPTER, MALE 11/16", FML 3/4"
26	HDW7499	1	90° ELBOW, MALE 3/4", HOSE BARB 1"
27	8064	1	CLAMP, HOSE, 1 3/4"
28	HDW7385	2	90° ELBOW, MALE 1/2", MALE 1/2" O-RING
29	HDW8276	2	SCREW, 3/8" X 16, 1 1/4" LG
30	HDW7783	2	WASHER, SPLIT, 3/8"
31	9605	1	TUBE, FUEL RETURN, 5/16" OD X 1/4"
32	6920	4	CLAMP, HOSE-GAS LINE
33	8514	1	FILTER, FUEL
		201111	(CONT'D)



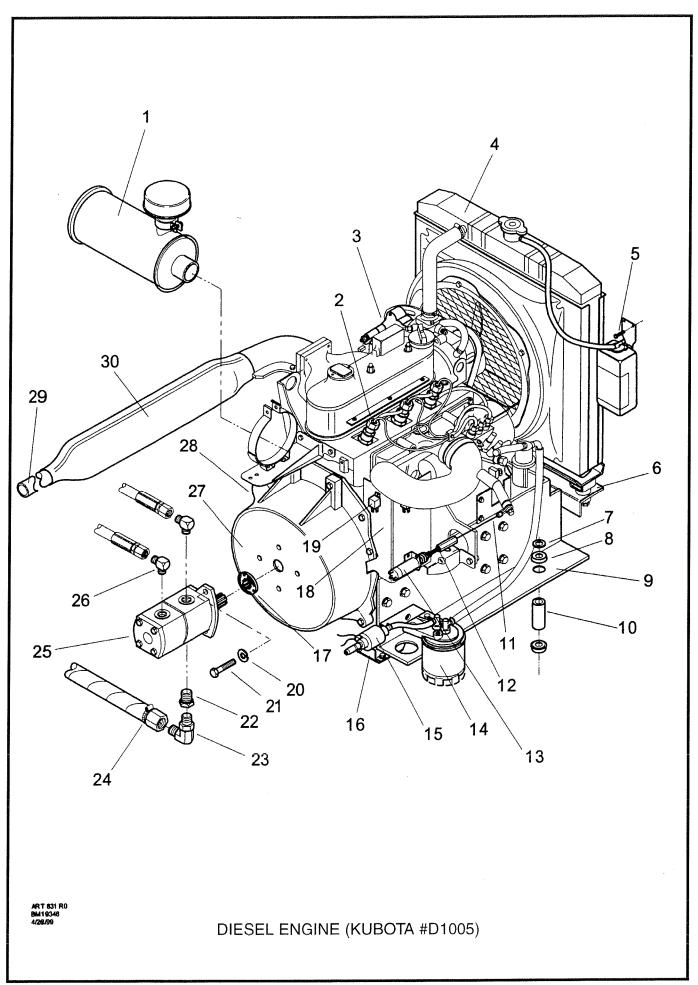
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34 8515 1 FILTER, AIR 35 8365 1 STARTER, GAS 36 20205 1 SPACER 37 20690 1 PIPE, EXHAUST 38 9696 1 HANGER, MUFFLER, VIBRATION 39 21020 1 BRACKET, REGULATOR/AIR/THROTTLE MOUNT 40 10185 1 SPACER, CENTER, ENGINE MOUNT 41 9834 1 CARBURETOR ASSY 42 9833 1 VAPORIZER ASSY	ITEM	PART NO.	QTY	DESCRIPTION
36 20205 1 SPACER 37 20690 1 PIPE, EXHAUST 38 9696 1 HANGER, MUFFLER, VIBRATION 39 21020 1 BRACKET, REGULATOR/AIR/THROTTLE MOUNT 40 10185 1 SPACER, CENTER, ENGINE MOUNT 41 9834 1 CARBURETOR ASSY 42 9833 1 VAPORIZER ASSY 9421 1 HARNESS, ENGINE, DUAL FUEL (KUBOTA) (NOT SHOW 6887 1 SWITCH, OIL PRESSURE (NOT SHOWN) 8516 1 FILTER, OIL (NOT SHOWN) 8727 1 RECTIFIER (NOT SHOWN)			 	
37 20690 1 PIPE, EXHAUST 38 9696 1 HANGER, MUFFLER, VIBRATION 39 21020 1 BRACKET, REGULATOR/AIR/THROTTLE MOUNT 40 10185 1 SPACER, CENTER, ENGINE MOUNT 41 9834 1 CARBURETOR ASSY 42 9833 1 VAPORIZER ASSY 9421 1 HARNESS, ENGINE, DUAL FUEL (KUBOTA) (NOT SHOW 6887 1 SWITCH, OIL PRESSURE (NOT SHOWN) 8516 1 FILTER, OIL (NOT SHOWN) 8727 1 RECTIFIER (NOT SHOWN)	35	8365	1	STARTER, GAS
38 9696 1 HANGER, MUFFLER, VIBRATION 39 21020 1 BRACKET, REGULATOR/AIR/THROTTLE MOUNT 40 10185 1 SPACER, CENTER, ENGINE MOUNT 41 9834 1 CARBURETOR ASSY 42 9833 1 VAPORIZER ASSY 9421 1 HARNESS, ENGINE, DUAL FUEL (KUBOTA) (NOT SHOWN) 6887 1 SWITCH, OIL PRESSURE (NOT SHOWN) 8516 1 FILTER, OIL (NOT SHOWN) 8727 1 RECTIFIER (NOT SHOWN)	36	20205	1	SPACER
39 21020 1 BRACKET, REGULATOR/AIR/THROTTLE MOUNT 40 10185 1 SPACER, CENTER, ENGINE MOUNT 41 9834 1 CARBURETOR ASSY 42 9833 1 VAPORIZER ASSY 9421 1 HARNESS, ENGINE, DUAL FUEL (KUBOTA) (NOT SHOW 6887 1 SWITCH, OIL PRESSURE (NOT SHOWN) 8516 1 FILTER, OIL (NOT SHOWN) 8727 1 RECTIFIER (NOT SHOWN)	37	20690	1	PIPE, EXHAUST
40 10185 1. SPACER, CENTER, ENGINE MOUNT 41 9834 1 CARBURETOR ASSY 42 9833 1 VAPORIZER ASSY 9421 1 HARNESS, ENGINE, DUAL FUEL (KUBOTA) (NOT SHOW 6887 1 SWITCH, OIL PRESSURE (NOT SHOWN) 8516 1 FILTER, OIL (NOT SHOWN) 8727 1 RECTIFIER (NOT SHOWN)	38	9696	1	HANGER, MUFFLER, VIBRATION
41 9834 1 CARBURETOR ASSY 42 9833 1 VAPORIZER ASSY 9421 1 HARNESS, ENGINE, DUAL FUEL (KUBOTA) (NOT SHOW 6887 1 SWITCH, OIL PRESSURE (NOT SHOWN) 8516 1 FILTER, OIL (NOT SHOWN) 8727 1 RECTIFIER (NOT SHOWN)	39	21020	1	BRACKET, REGULATOR/AIR/THROTTLE MOUNT
42 9833 1 VAPORIZER ASSY 9421 1 HARNESS, ENGINE, DUAL FUEL (KUBOTA) (NOT SHOW 6887 1 SWITCH, OIL PRESSURE (NOT SHOWN) 8516 1 FILTER, OIL (NOT SHOWN) 8727 1 RECTIFIER (NOT SHOWN)	40	10185	1	SPACER, CENTER, ENGINE MOUNT
9421 1 HARNESS, ENGINE, DUAL FUEL (KUBOTA) (NOT SHOW 6887 1 SWITCH, OIL PRESSURE (NOT SHOWN) 8516 1 FILTER, OIL (NOT SHOWN) 8727 1 RECTIFIER (NOT SHOWN)	41	9834	4	CARBURETOR ASSY
6887 1 SWITCH, OIL PRESSURE (NOT SHOWN) 8516 1 FILTER, OIL (NOT SHOWN) 8727 1 RECTIFIER (NOT SHOWN)	42	9833	1	VAPORIZER ASSY
8516 1 FILTER, OIL (NOT SHOWN) 8727 1 RECTIFIER (NOT SHOWN)	***************************************	9421	1	HARNESS, ENGINE, DUAL FUEL (KUBOTA) (NOT SHOWN)
8727 1 RECTIFIER (NOT SHOWN)		6887	1	SWITCH, OIL PRESSURE (NOT SHOWN)
		8516	1	FILTER, OIL (NOT SHOWN)
6890 1 HOSE ASSY-LP COUPLING TO FILTER (NOT SHOWN)	-	8727	1	RECTIFIER (NOT SHOWN)
		6890	1	HOSE ASSY-LP COUPLING TO FILTER (NOT SHOWN)
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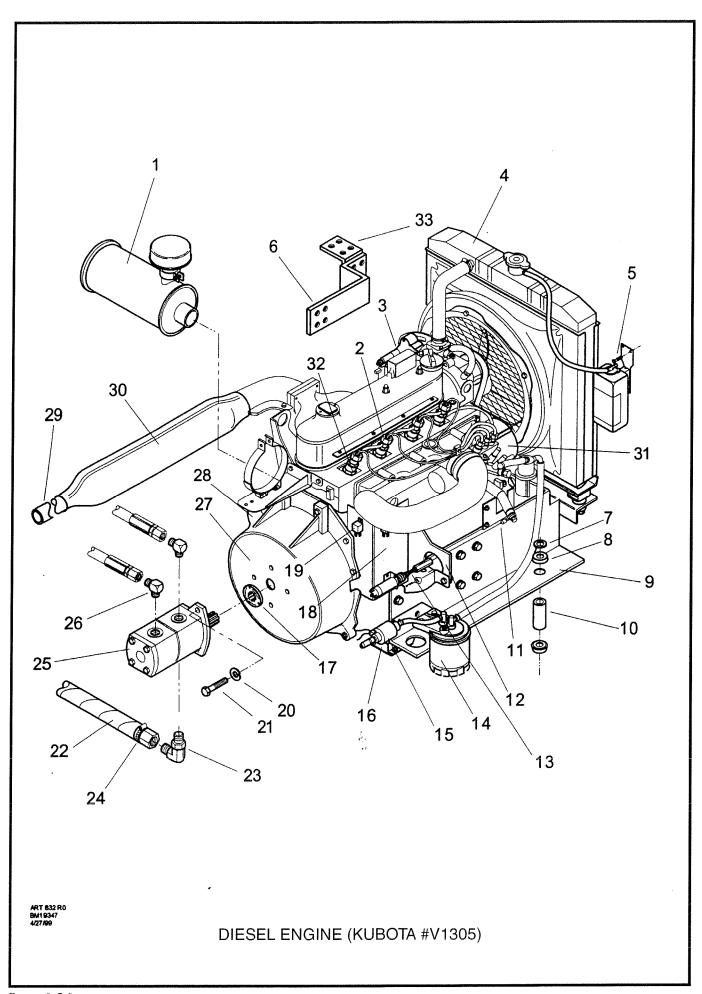
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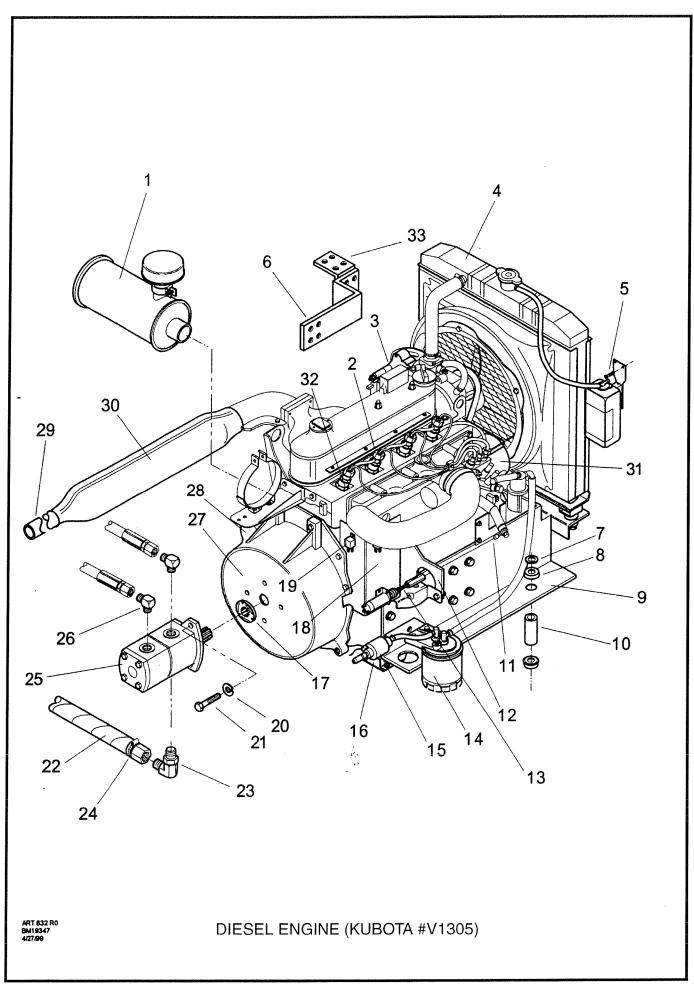
TITEM	PART NO.	QTY	DESCRIPTION
1	9889	1	CAP, AIR BOX
2	9890	1	CLAMP, AIR BOX
3	9891	1	SCREW, AIR BOX CAP CLAMP
4	9892	1	CLAMP, AIR BOX HOSE
5	9793	1	RADIATOR
6	20920	1	BRACKET, RADIATOR MOUNT
7	20918	1	BRACKET, ENGINE MOUNT
8	9785	1	FILTER, OIL
9	9787	1	PUMP, FUEL
	9795	1	GASKET, FUEL PUMP
10	20958	1	BRACKET, ELECTRIC ENGINE MOUNT
11	9278	2	RELAY, 12 VOLT N/O SUPPRESSION
12	9655	1	HOUSING, PUMP
	9658	1	HUB, 3/4" SHAFT
13	HDW9736	1	FITTING, 90° ELBOW, MALE 1 1/2", MALE 1" O-RING
14	HDW8276	2	SCREW, 3/8"-16, 1 1/4" LG
15	HDW7783	2	WASHER, SPLIT, 3/8"
16	9786	1	FILTER, FUEL
17	8064	1	CLAMP, HOSE, 1 3/4"
18	9737	1	HOSE, 1 1/2" ID X 56 1/2" LG, LOW PRESSURE
19	9644	1	PUMP, HYD
20	20930	2	BRACKET
21	9888	1	MUFFLER
22	9868	1	CLAMP, EXHAUST 1 3/4"
23	9893	1	SCREW, AIR BOX MOUNTING CLAMP
24	20912	1	BRACKET, RADIATOR HOSE SUPPORT
25	21013	1	REDUCER
26	9894	1	HARDWARE, AIR BOX MOUNT
27	20986	1	PIPE, EXHAUST
28	9789	1	MOTOR, STARTER
	9791	1	ALTERNATOR ASSY
	9792 .	1	REGULATOR ASSY
	9794	1	SWITCH, FAN MOTOR
	9796	1	SENSOR, WATER TEMPERATURE
	9797	1	COIL, IGNITION AND BRACKET



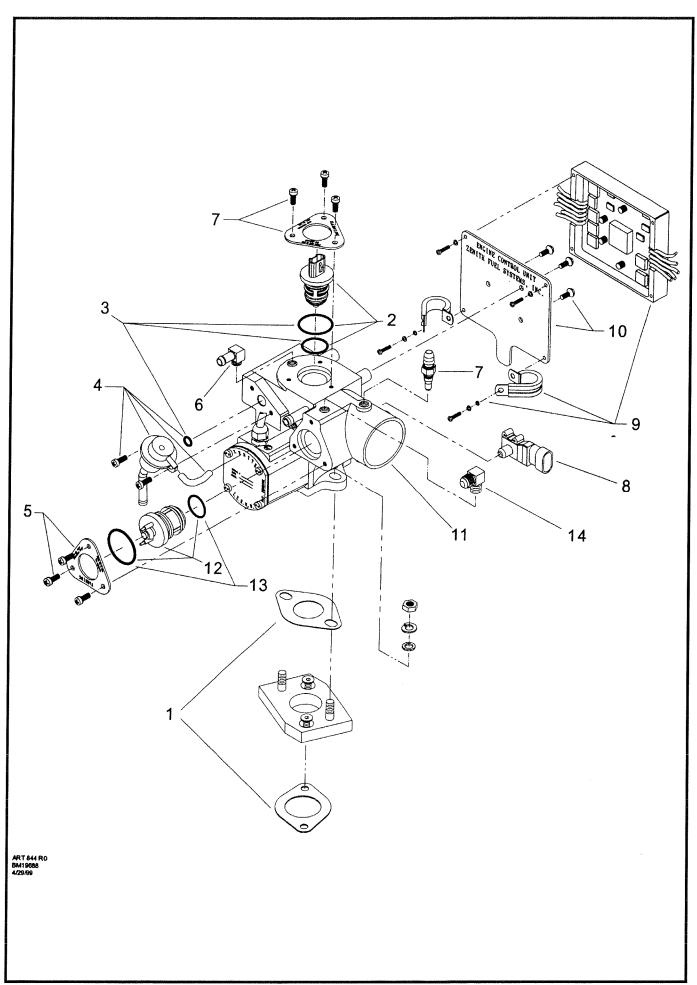
ITEM	PART NO.	QTY	DESCRIPTION
1	8667	1	AIR FILTER
2	9832	3	GLOW PLUGS
3	7975	1	ALTERNATOR
4	9831	1	RADIATOR
5	HDW5723	2	SCREW, 1/4"-20, 3/4" LG
6	20743	1	BRACKET, RADIATOR
7	HDWI 0687	4	WASHER, FLAT
8	7736	8	INSULATOR, RUBBER
9	20740	1	BRACKET, ENGINE MOUNTING-LEFT SIDE
	20739	1	BRACKET, ENGINE MOUNTING-RIGHT SIDE
10	10685	4	SPACER, INSULATER, "D"
11	10704	1	CABLE ASSY-THROTTLE
12	10695	1	STUD, THROTTLE
13	9402	1	SOLENOID, 12 VDC, 9 LB. PULL
14	8666	1	FILTER, FUEL
15'	8035	1	PUMP, FUEL
16	20804	1	BRACKET, FILTER, FUEL PUMP
17	9653	1	COUPLING, PUMP
	9654	1	PUMP, HARDWARE KIT
18	20805	1	BRACKET, THROTTLE SOLENOID
19	9278	3	RELAY, 12 VOLT, N/O WITH SUPPRESSION
20	HDW7783	1	WASHER, SPLIT, 3/8"
21	HDW8276	1	SCREW, 3/8"-16, 1 1/4" LG
22	HDW8562	1	ADAPTOR, MALE 1" O-RING, FML 3/4"
23	HDW7499	1	90° ELBOW, MALE 3/4", 1" HOSE BARB
24	8064	1	CLAMP, HOSE, 1 3/4"
25	7318	1	PUMP, HYD
26	HDW7385	2	90° ELBOW, MALE 1/2", MALE 1/2" O-RING
27	9652	1	HOUSING, PUMP
28	20740	1	BRACKET, ENGINE MOUNTING
29	20878	1	PIPE, EXHAUST
30	9830	1	MUFFLER
	8665	1	FILTER, OIL (NOT SHOWN)
	8001	1	SOLENOID, FUEL (NOT SHOWN)
	8413	1	STARTER (NOT SHOWN)



ITEM	PART NO.	QTY	DESCRIPTION
1	8667	1	AIR FILTER
2	9829	4	GLOW PLUGS
3	7975	1	ALTERNATOR
4	9827	1	RADIATOR
5	HDW5723	2	SCREW, 1/4"-20, 3/4" LG
6	9896	1	BRACKET, ENGINE RADIATOR MOUNT
7	HDW10687	4	WASHER, FLAT
8	7736	8	INSULATOR, RUBBER
9	20930	1	BRACKET, ENGINE DIESEL
	20931	1	BRACKET, ENGINE DIESEL WITH GENERATOR
10	10685	4	SPACER, INSULATER, "D"
11	10704	1	CABLE ASSY-THROTTLE
12	10695	1	STUD, THROTTLE
13	9402	1	SOLENOID, 12 VDC, 9 LB. PULL
14	8666	1	FILTER, FUEL
15	9898	1	PUMP, FUEL, DIESEL V3105
16	20804	1	BRACKET, FILTER, FUEL PUMP
17	9899	1	COUPLING, PUMP
18	20805	1	BRACKET, THROTTLE SOLENOID
19	9829	3	RELAY, 12 VOLT, N/O WITH SUPPRESSION
20	HDW7783	1	WASHER, SPLIT, 3/8"
21	HDW8276	1	SCREW, 3/8"-16, 1 1/4" LG
22	9737	1	HOSE, 1 1/2" X 56 1/2" LG, LOW PRESSURE
23	HDW9736	ı	90° ELBOW, MALE 1 1/2", MALE 1" O-RING
24	8064	1	CLAMP, HOSE, 1 3/4"
25	9644	1	PUMP, HYD
26	HDW7385	2	90° ELBOW, MALE 1/2", MALE 1/2" O-RING
27	9652	1	HOUSING, PUMP
28	20930	1	BRACKET, ENGINE MOUNTING
29	20878	1	PIPE, EXHAUST
30	9830	1	MUFFLER
31	9828	1	PUMP ASSY- INJECTION
			CONT'D

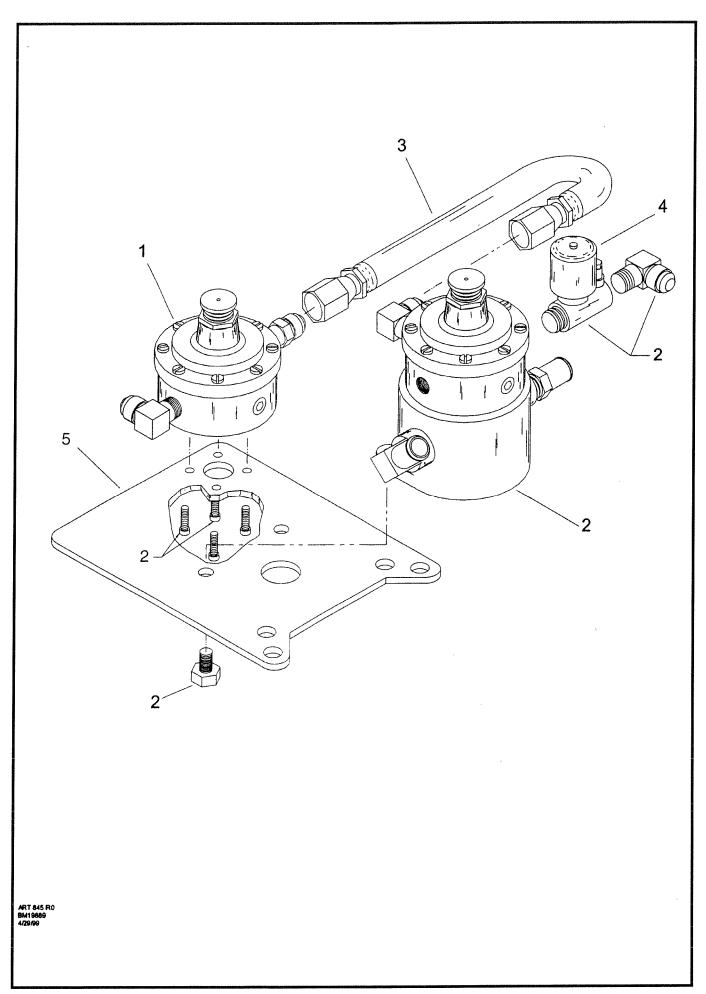


ITEM	PART NO.	QTY	DESCRIPTION
32	7852	1	FUEL LINE, 3/16"
33	9897	1	FUEL LINE, 3/16"
	8665	1	FILTER, OIL (NOT SHOWN)
	8001	1	SOLENOID, FUEL (NOT SHOWN)
	9826	1	STARTER (NOT SHOWN)
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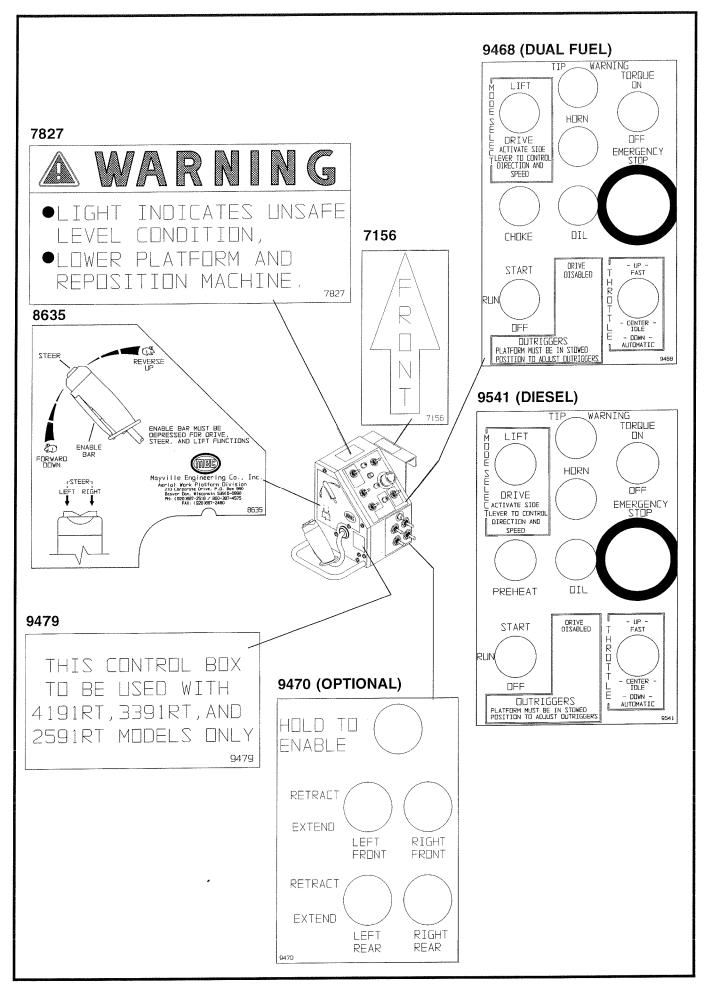
ITEM	PART NO.	QTY	DESCRIPTION
	9800	1	THROTTLE BODY ASSY WITH 'ECU'
1	9801	1	MANIFOLD GASKET KIT
2	9802	1	INJECTOR, GASOLINE, WITH TOP & BOTTOM O-RINGS
3	9803	1	O-RINGS, INJECTOR & PRESSURE REGULATOR
4	9804	1	REGULATOR, GAS PRESSURE W/ O-RING, HOSE & SCREWS
5	9805	1	INJECTOR MOUNTING PLATE & SCREWS
6	9806	1	INLET, GASOLINE FUEL
7	9807	1	SENSOR, AIR OR COOLANT TEMPERATURE
8	9808	1	SENSOR, MANIFOLD, ABSOLUTE PRESSURE
9	9809	1	CONTROL UNIT, ELECTRONIC, WITH SCREWS & CLAMPS
10	9810	1	'ECU' MOUNTING PLATE & SCREWS
11	9811	1	THROTTLE BODY WITH INTEGRAL GOVERNOR ACTUATOR
12	9812	1	INJECTOR, LP GAS, WITH 2 O-RINGS
13	9813	1	O-RINGS, TOP & BOTTOM, INJECTOR, LP GAS
14	9814	1	INLET, LP GAS THROTTLE BODY FUEL
15	9787	1	PUMP, GASOLINE FUEL (NOT SHOWN)
16	9786	1	FILTER, GASOLINE FUEL, W/HOSE CLAMPS (NOT SHOWN)
17	9815	1	FILTER, LP GAS FUEL (NOT SHOWN)

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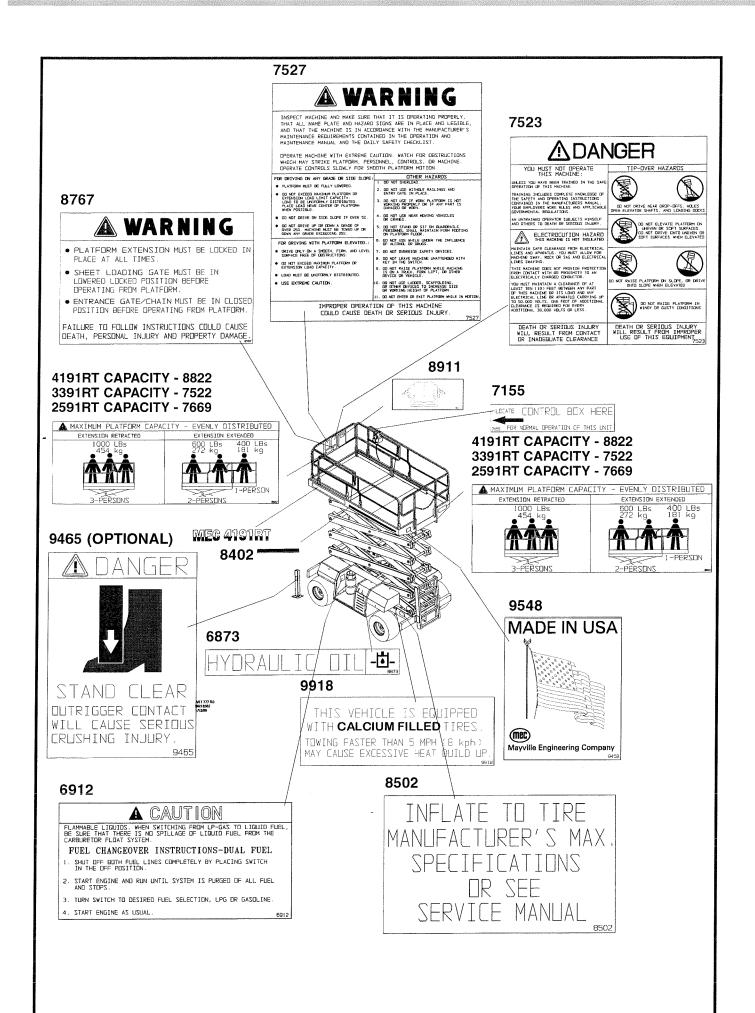


9820	ITEM	PART NO.	QTY	DESCRIPTION
1 9821 1 REGULATOR, SECONDARY LP & 4 SCREWS 2 9822 1 REGULATOR, PRIMARY, & 2 SCREWS 3 9823 1 LP HOSE ASSY - PRIMARY TO SECONDARY 4 9824 1 LP LOCK OFF				
3 9823 1 LP HOSE ASSY - PRIMARY TO SECONDARY 4 9824 1 LP LOCK OFF	1	9821	1	
4 9824 1 LP LOCK OFF	2	9822	1	REGULATOR, PRIMARY, & 2 SCREWS
	3	9823	1	LP HOSE ASSY - PRIMARY TO SECONDARY
5 9825 1 BRACKET, VAPORIZER	4	9824	1	LP LOCK OFF
	5	9825	1	BRACKET, VAPORIZER
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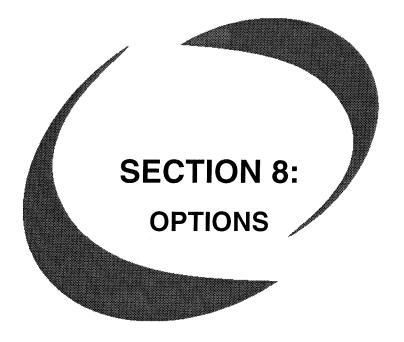


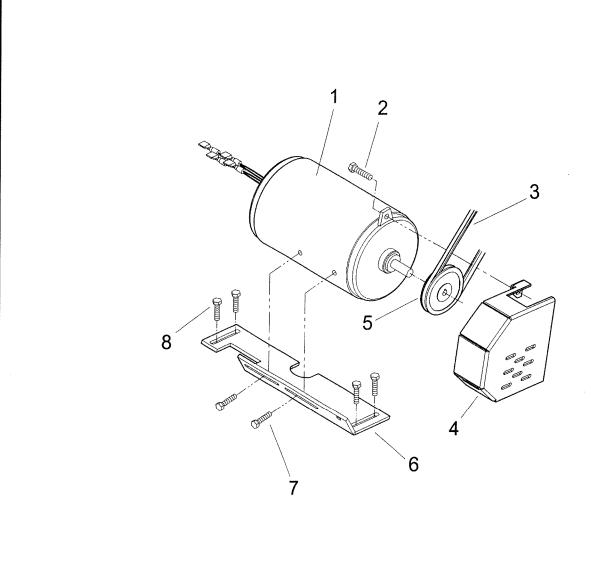


ITEM	PART NO.	QTY	DESCRIPTION
	21033	1	DECAL KIT - 2591RT
	21032	1	DECAL KIT - 3391RT
	21031	1	DECAL KIT - 4191RT
	21031		DECAL KIT - 4191KT
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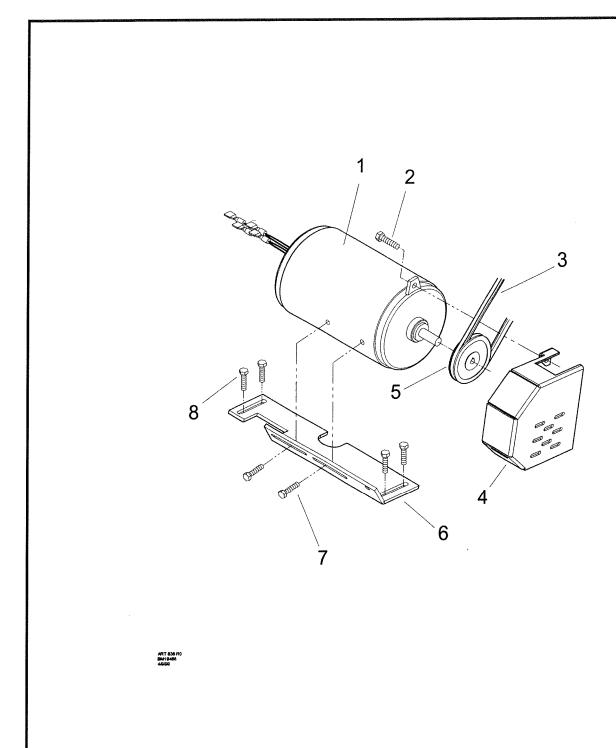
ITEM	PART NO.	QTY	DESCRIPTION
	21033	1	DECAL KIT - 2591RT
	21032	1	DECAL KIT - 3391RT
	21031	1	DECAL KIT - 4191RT
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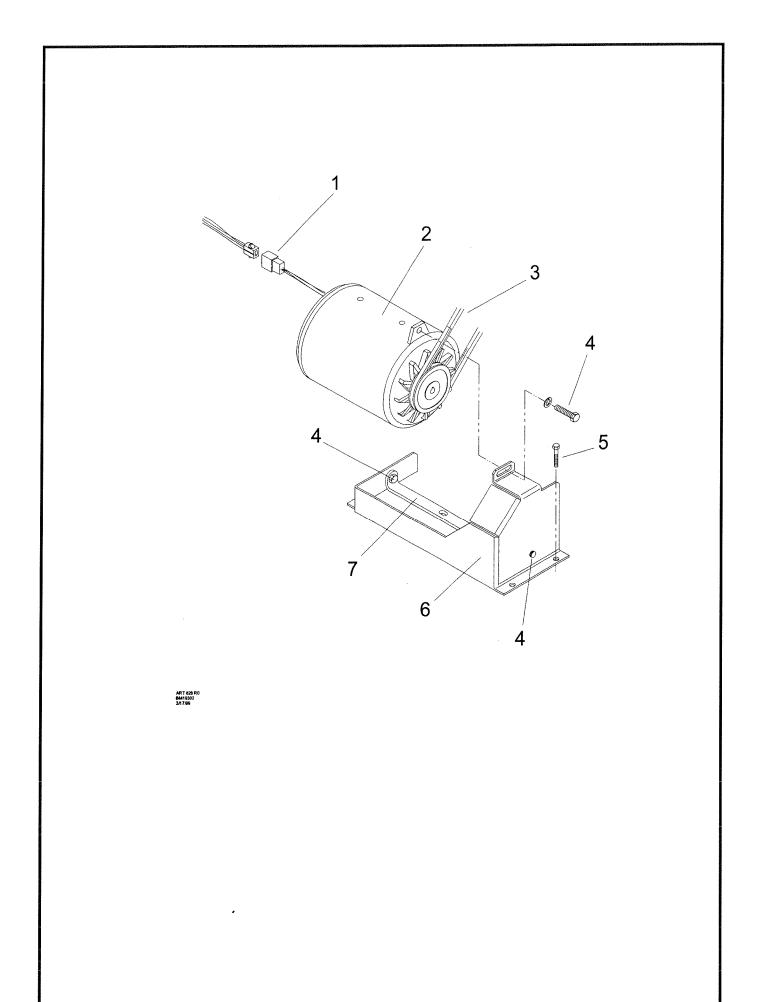
ART 828 R

ITEM	PART NO.	QTY	DESCRIPTION
	20658	<u> </u>	GENERATOR, DUAL FUEL ENGINE (KUBOTA #DF750)
1	9710	1	GENERATOR, 3000 WATTS
2	HDW5009	1	SCREW, 3/8"-16, 3/4" LG
3	9844	1	BELT, 4L X 30" LG
4	21015	1	COVER, GENERATOR PULLEY
5	9701	1	PULLEY, 4L GENERATOR (DF750)
6	21014	1	BRACKET, GENERATOR MOUNTING
7	HDW5004	2	SCREW, 3/8"-16, 1" LG
8	HDW5724	4	SCREW, 5/16"-18, 3/4" LG
	9521	1	PULLEY, DOUBLE GROOVE - ON ENGINE
	9637	1	HOLE PLUG - CABINETRY, GENERATOR PLUG IN
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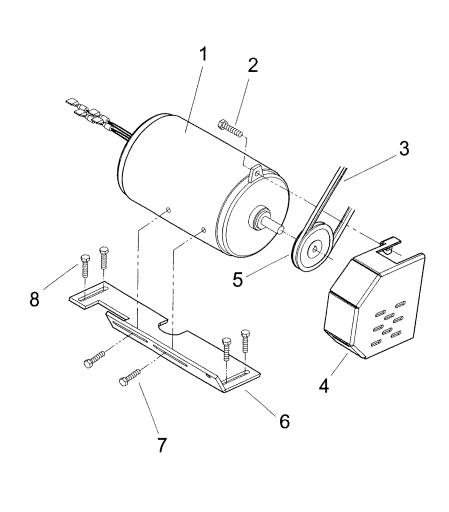


Page 8-4

ITEM	PART NO.	QTY	DESCRIPTION
	20978		GENERATOR, DIESEL ENGINE (KUBOTA #D1005)
1	9710	1	GENERATOR, 3000 WATTS
2	HDW5009	ı	SCREW, 3/8"-16, 3/4" LG
3	9704	1	BELT, GENERATOR
4	21015	1	COVER, GENERATOR PULLEY
5	9713	1	PULLEY, 3.36"
6	21014	1	BRACKET, GENERATOR MOUNTING
7	HDW5004	2	SCREW, 3/8"-16,1" LG
8	HDW5724	4	SCREW, 5/16"-18, 3/4" LG
	9714	1 1	PULLEY, DOUBLE GROOVE - ON ENGINE
	9637	1	HOLE PLUG-CABINETRY, GENERATOR PLUG IN
	,		
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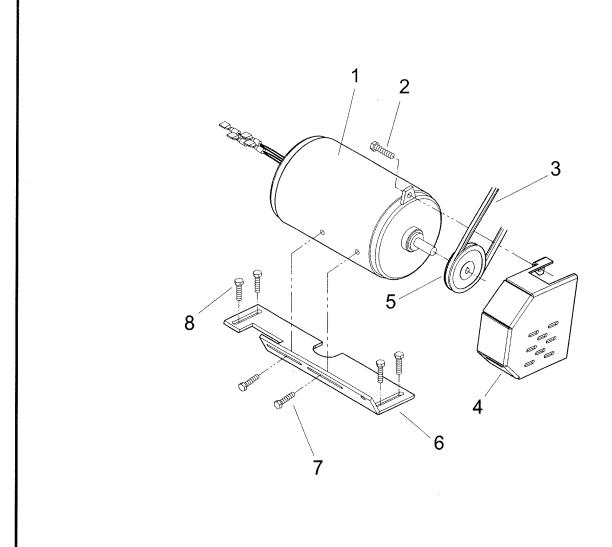


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IICIV	PART NO.	QTY	
			GENERATOR, DIESEL ENGINE, (KUBOTA #D1005)
4	0070		SERIAL NUMBER: 9500108 ONLY
1	9278	1	RELAY, 12 VOLT N/O SUPPRESSION
2	9490	1	GENERATOR, 2 3/4" PULLEY, 3000 WATTS
3	9491	1	BELT, A29, GENERATOR
4	HDW5009	3	SCREW, 3/8"-16, 3/4" LG
5	HDW5724	4	SCREW, 5/16"-18, 3/4" LG
6	20657	1	BRACKET, MOUNTING, GENERATOR
7	20775	1	BRACKET, PILOT GENERATOR
	9521	1	PULLEY, DOUBLE GROOVE - ON ENGINE
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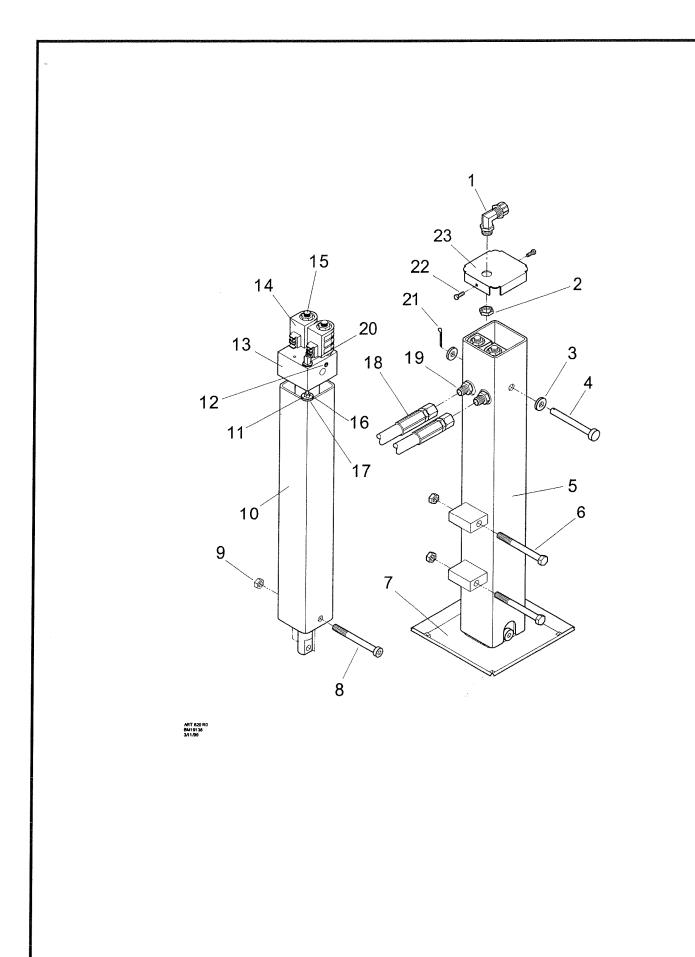
ART 837 R0 BM19496 4/5/99

ITEM	PART NO.	QTY	DESCRIPTION
	20977	_	GENERATOR, DIESEL ENGINE (KUBOTA #V1305)
1	9710	1	GENERATOR, 3000 WATTS
2	HDW5009		SCREW, 3/8"-16, 3/4" LG
3	9843	1	BELT, 3L X 28" LG
4	21015	1	COVER, GENERATOR PULLEY
5	9842	1	PULLEY, 3L V1305 GENERATOR
6	21014	1	BRACKET, GENERATOR MOUNTING
7	HDW5004	2	SCREW, 3/8"-16, 1" LG
8	HDW5724	4	SCREW, 5/16"-18, 3/4" LG
	9698	1	PULLEY, DOUBLE GROOVE - ON ENGINE
	9637	1 1	HOLE PLUG-CABINETRY, GENERATOR PLUG IN
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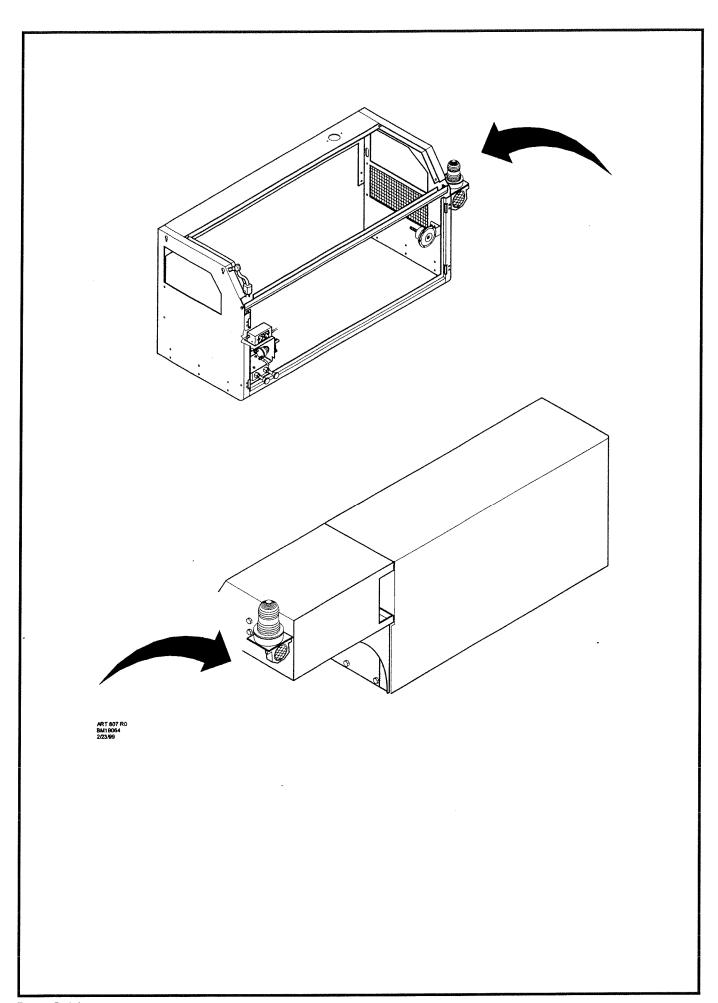


ITEM	PART NO.	QTY	DESCRIPTION
- 1 = 141	20959	- C	GENERATOR, DUAL FUEL ENGINE (FORD #1.3L)
1	9710	1	GENERATOR, 3000 WATTS
2	HDW5009	1	SCREW, 3/8"-16, 3/4" LG
3	9777	1	BELT, 3L X 34" LG
4	21015	1	COVER, GENERATOR PULLEY
5	9703	1 1	PULLEY, 4" A-BELT
6	21014	1	BRACKET,GENERATOR MOUNTING
7	HDW5004	2	SCREW, 3/8"-16, 1" LG
8	HDW5724	4	SCREW, 5/16"-18, 3/4" LG
9	9838	1	PULLEY, DOUBLE GROOVE - ON ENGINE
	9637	1	HOLE PLUG - CABINETRY, GENERATOR PLUG IN
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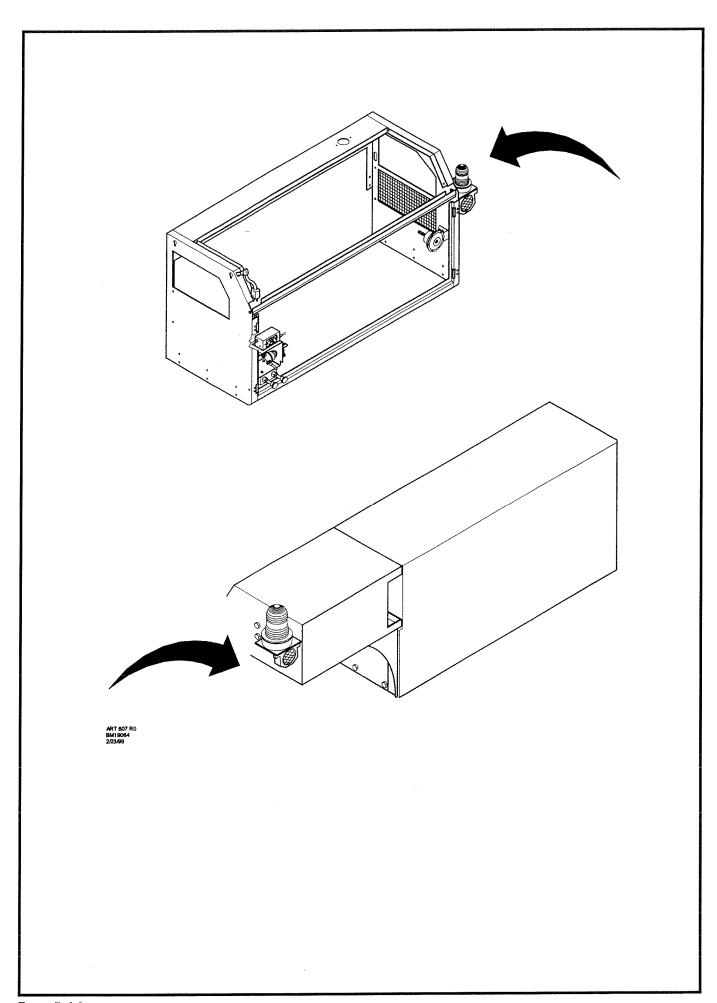
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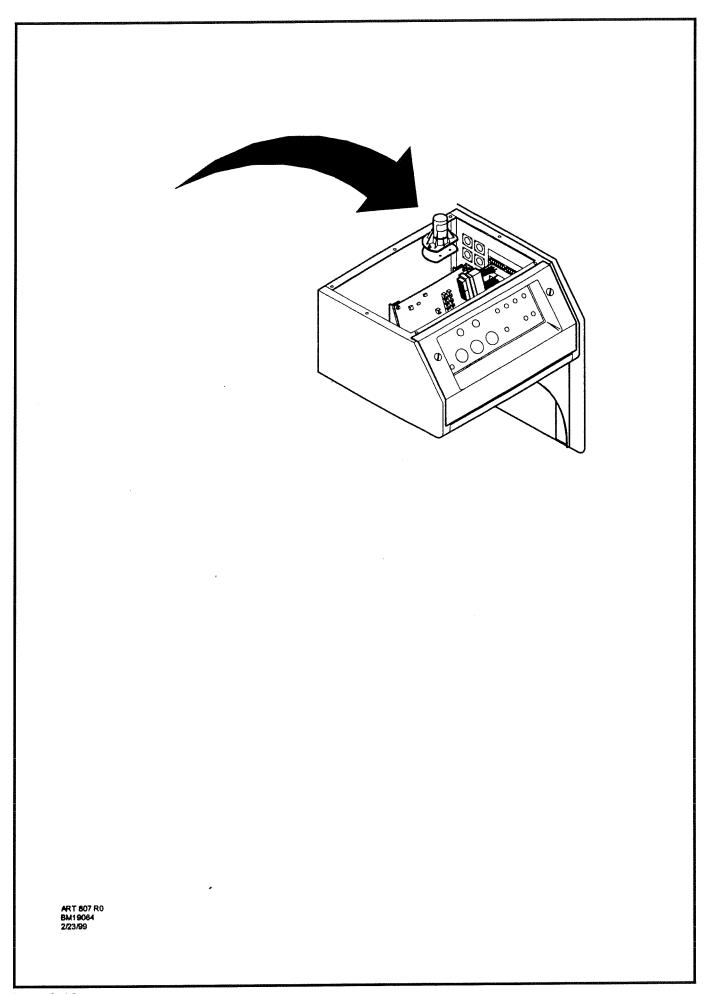
ITEM	PART NO.	QTY	DESCRIPTION
1	8005	1	CONNECTOR, CORD 90°
2	8006	1	NUT, CONNECTOR-1/2" CONDUIT
3	HDW5785	2	WASHER, FLAT 1 1/2" OD
4	HDW8007	1	PIN, CLEVIS 5/8"- 4 1/2" LG
5	10343	1	TUBE WELDMENT
6	HDW7052	2	SCREW, 1/2"-13, 3 1/2" LG
7	10340	1	FOOT WELDMENT
8	HDW59I 6	1	SCREW, 1/2"-13, 4" LG
9	HDW6349	3	NUT, 1/2"-13
10	10335	1	TUBE, INNER
11	HDW5276	1	NUT, 1/4"-20
12	6423	2	PLUG, 1 /8"-27, BRASS
13	7137	1	CYLINDER, OUTRIGGER
14	6870	2	COIL, 12 VOLT, 1 SPADE W/DIODE
15	6973	2	VALVE, N.C. POPPET, 2-WAY
16	HDW8065	1	SCREW, 1/4"-20, 2 1/4" LG
17	10907	1	WASHER, ACTUATOR
18	9404	2	HOSE ASSY, STRGHT FML, STRGHT FML, 1/4" ID, 63" LG
19	HDW7391	2	FITTING, TEE, MALE 3/8"
20	6504	1	SWITCH
21	5920	1	PIN, COTTER, 1/8" DIA 1" LG
22	HDW6455	2	SCREW, 1/4"-20, 1/2" LG
23	10339	1	COVER
	9423	1	WIRE HARNESS, FRONT LEFT
	9440	1	WIRE HARNESS, FRONT RIGHT
	9442	1	WIRE HARNESS, REAR LEFT
	9443	1	WIRE HARNESS, REAR RIGHT
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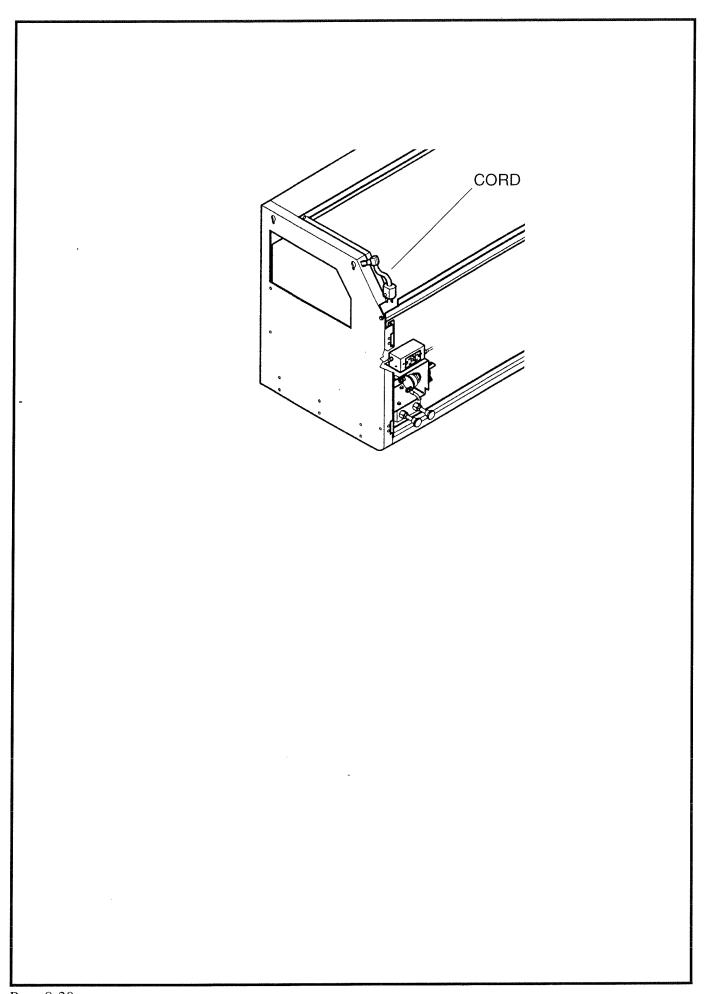
20629	ITEM	PART NO.	QTY	DESCRIPTION
9434 1 HARNESS LIGHT/ ALARM HDW5723 4 SCREW, 1/4"-20, 3/4" LG HDW5276 4 NUT, 1/4"-20 20775 2 FLASHING LIGHT ASSY 8045 1 BULB, 12 VOLT 7101 1 FLASHING LIGHT 9530 1 CONNECTOR 9531 2 PIN 9610 1 WEDGE 20629 - MOTION ALARM 14981 1 BRACKET, FLASHING LIGHT 8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		20629	-	FLASHING LIGHT
HDW5723		14981	1	BRACKET, FLASHING LIGHT
HDW5276		9434	1	HARNESS LIGHT/ ALARM
20775 2 FLASHING LIGHT ASSY 8045 1 BULB, 12 VOLT 7101 1 FLASHING LIGHT 9530 1 CONNECTOR 9531 2 PIN 9610 1 WEDGE 20629 - MOTION ALARM 14981 1 BRACKET, FLASHING LIGHT 8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		HDW5723	4	SCREW, 1/4"-20, 3/4" LG
8045 1 BULB, 12 VOLT 7101 1 FLASHING LIGHT 9530 1 CONNECTOR 9531 2 PIN 9610 1 WEDGE WEDGE WEDGE WEDGE WEDGE WE		HDW5276	4	NUT, 1/4"-20
7101 1 FLASHING LIGHT 9530 1 CONNECTOR 9531 2 PIN 9610 1 WEDGE 20629 - MOTION ALARM 14981 1 BRACKET, FLASHING LIGHT 8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		20775	2	FLASHING LIGHT ASSY
9530 1 CONNECTOR 9531 2 PIN 9610 1 WEDGE 20629 - MOTION ALARM 14981 1 BRACKET, FLASHING LIGHT 8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		8045	1	BULB, 12 VOLT
9531 2 PIN 9610 1 WEDGE 20629 - MOTION ALARM 14981 1 BRACKET, FLASHING LIGHT 8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		7101	1	FLASHING LIGHT
9610 1 WEDGE 20629 - MOTION ALARM 14981 1 BRACKET, FLASHING LIGHT 8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		9530	1	CONNECTOR
20629 - MOTION ALARM 14981 1 BRACKET, FLASHING LIGHT 8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		9531	2	PIN
14981 1 BRACKET, FLASHING LIGHT 8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		9610	1	WEDGE
14981 1 BRACKET, FLASHING LIGHT 8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		100 H PR//10		
14981 1 BRACKET, FLASHING LIGHT 8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM				
8698 2 MOTION ALARM, 12-48 VOLT 8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		20629	-	MOTION ALARM
8709 2 TEMINAL INSULATOR - RED 8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		14981	1	BRACKET, FLASHING LIGHT
8710 2 TERMINAL INSULATOR - BLACK 9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		8698	2	MOTION ALARM, 12-48 VOLT
9424 2 HARNESS, MOTION ALARM 9434 1 HARNESS, MOTION LIGHT/ALARM		8709	2	TEMINAL INSULATOR - RED
9434 1 HARNESS, MOTION LIGHT/ALARM		8710	2	TERMINAL INSULATOR - BLACK
		9424	2	HARNESS, MOTION ALARM
HDW7241 8 SCREW, 1/4"-14, 3/4" LG			1	HARNESS, MOTION LIGHT/ALARM
		HDW7241	8	SCREW, 1/4"-14, 3/4" LG
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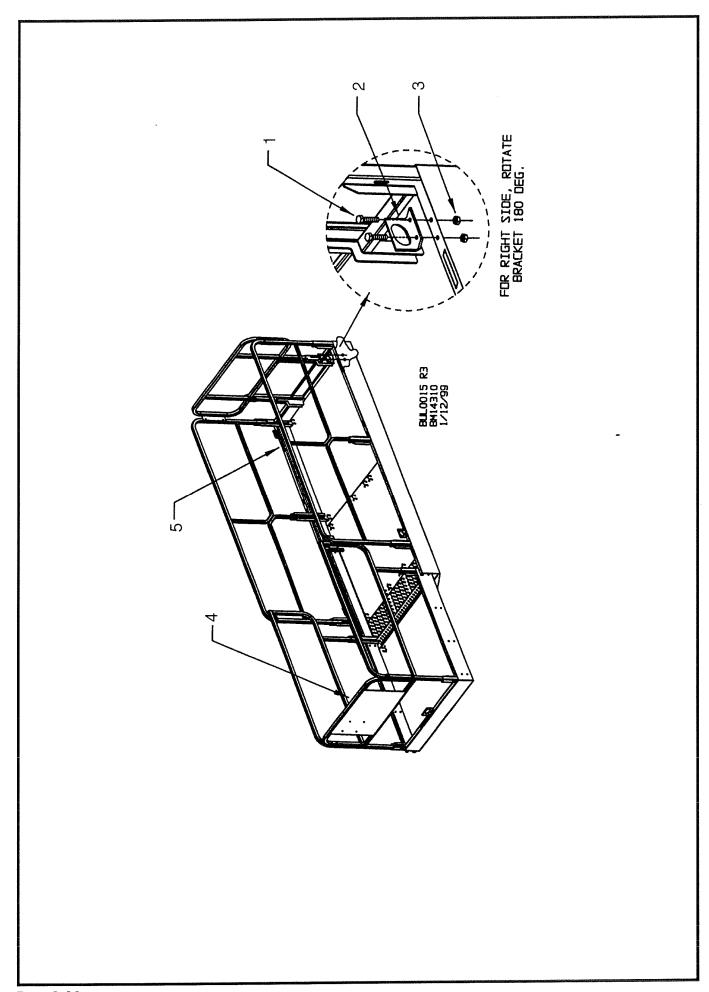
ITEM	PART NO.	QTY	DESCRIPTION
	20606		110V OUTLET - 4191RT
	20607	_	110V OUTLET - 3391RT
	20608	-	110V OUTLET - 2591RT
	11373	1	OUTLET BOX BRACKET
	4319	1	OUTLET BOX GFI (BASE)
	4333	1	RECEPTACLE BOX, DUPLEX (BASE)
	5381	1	RECEPTACLE, DUPLEX (PLATFORM)
	5382	1	110V PLUG (BASE)
	6456	1	CORD GRIP, STEEL
	7263	1	RECEPTACLE GFI, DUPLEX (BASE)
	7617	65'	WIRE, 14 GA 3 CONDUCTOR - 4191RT
		55'	WIRE, 14 GA 3 CONDUCTOR - 3391RT
		45'	WIRE, 14 GA 3 CONDUCTOR - 2591RT
	8006	2	NUT, CONNECTOR, 112" CONDUIT
	8207	1	CONNECTOR, CONDUIT, 90°
	8208	1	FLEXIBLE CONDUIT, 3/8" X 18"
	8209	1	FERRULE, CONDUIT 3/8"
77	HDW5229	2	SCREW, #6-32, 3/8" LG
	HDW6455	2	SCREW, 1/4"-20, 1/2" LG (OUTLET BOX TO BRACKET AT PLATFORM)
	HDW5724	2	SCREW, 5/16"-18, 3/4" LG (OUTLET TO BRACKET)
	HDW850I	2	NUT, #6-32 (OUTLET BOX AT PLATFORM)
	HDW8304	2	NUT, 5/16"-18 (AT BASE)
	5764	1	BUSHING, 90° STRAIN RELIEF
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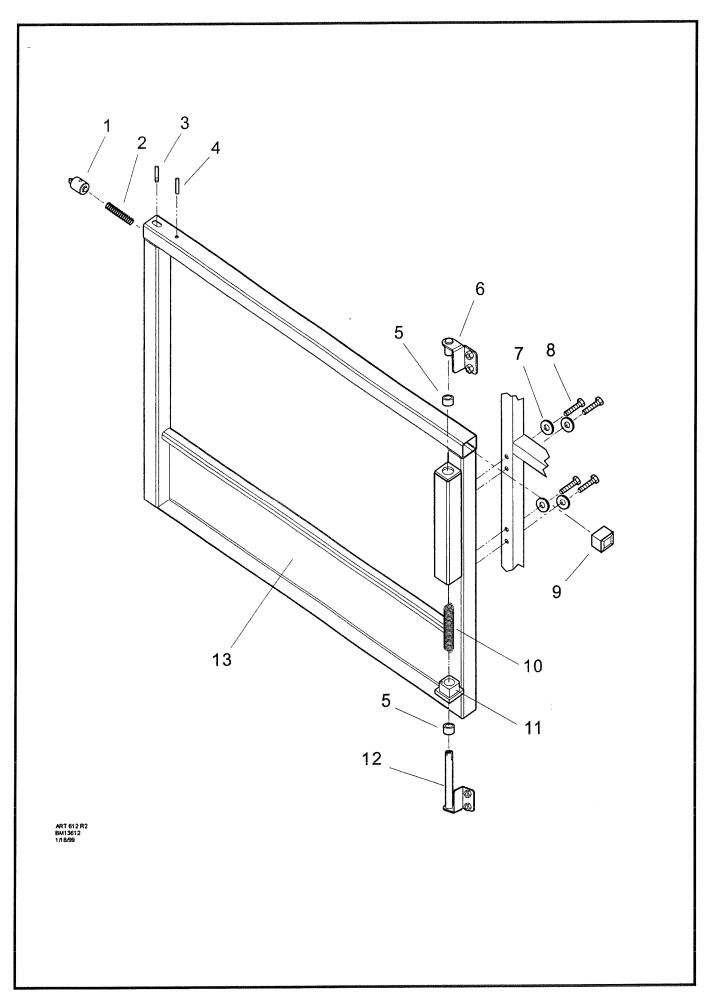
ITEM	PART NO.	QTY	DESCRIPTION
II LIVI	20622	G(II	4.5° TILT SENSOR
	9493	1	SENSOR, TIP, 12 VOLT, 4.5°
	HDW5276	4	NUT, 1/4"-20
	HDW6455	4	SCREW, 1/4"-20, 1/2" LG
	11000000	-	GOTTE VV, 1/4 -20, 1/2 EG
	20623	-	2° TILT SENSOR (EUROPE)
	9494	1	SENSOR, TIP, 12 VOLT, 2°
	HDW5276	4	NUT, 1/4"-20
	HDW6455	4	SCREW, 1/4"-20, 1/2" LG
	20632	-	AIRLINE TO PLATFORM - 4191RT
	5351	1	CABLE TIE
	8548	72 FT	HOSE, 1/4" AIRLINE
	8557	1	CLAMP, 1 HOLE, 9/16" DIA
	8559	2	CLAMP, HOSE, TWO EAR, 9/16"
	HDW6455	1	SCREW, 1/4"-20, 1/2" LG
	20633	-	AIRLINE TO PLATFORM - 3391RT
	5351	1	CABLE TIE
77.03.4	8548	62 FT	HOSE, 1/4" AIRLINE
n. 6 5/4	8557	1	CLAMP, 1 HOLE, 9/16" DIA
	8559	2	CLAMP, HOSE, TWO EAR, 9/16"
	HDW6455	1	SCREW, 1/4"-20, 1/2" LG
	20634	_	AIRLINE TO PLATFORM - 2591RT
	5351	1	CABLE TIE
	8548	52 FT	HOSE, 1/4" AIRLINE
	8557	1	CLAMP, 1 HOLE, 9/16" DIA
	8559	2	CLAMP, HOSE, TWO EAR, 9/16"
	HDW6455	1	SCREW, 1/4"-20, 1/2" LG



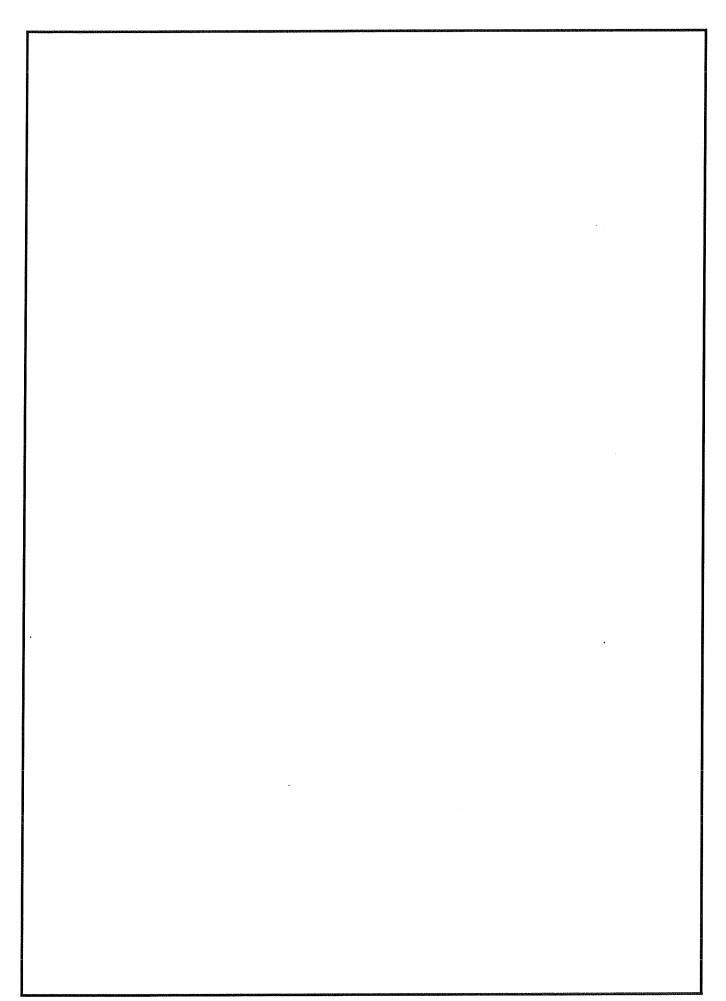
ITEM	PART NO.	QTY	DESCRIPTION
	20609	-	220 AC CORD ONLY - 4191RT
	9441	70FT	WIRE, BULK, 14 GA
	20610	_	220 AC CORD ONLY - 3391RT
	9441	6OFT	WIRE, BULK, 14 GA
	20611	-	220 AC CORD ONLY - 2591RT
	9441	5OFT	WIRE, BULK, 14 GA
	20602	-	BASE CONTROL CORD
	9437	1	HARNESS, BASE CONTROL CORD
		7772	
	11 MAR CONTRACTOR CONT		
- Politica			



ITEM	PART NO.	QTY	DESCRIPTION
	1741111101	4	LANYARD ANCHOR ATTACHMENT
1	HDW6433	10	SCREW, 3/8"-16, 1" LG, GR 5
2	3923	5	BRACKET, ATTACH POINT W/ 90°
3	HDW8268	10	NUT, 3/8"-16
4	8606	1	DECAL, WARNING
5	8605	5	DECAL, LANYARD ATTACH POINT
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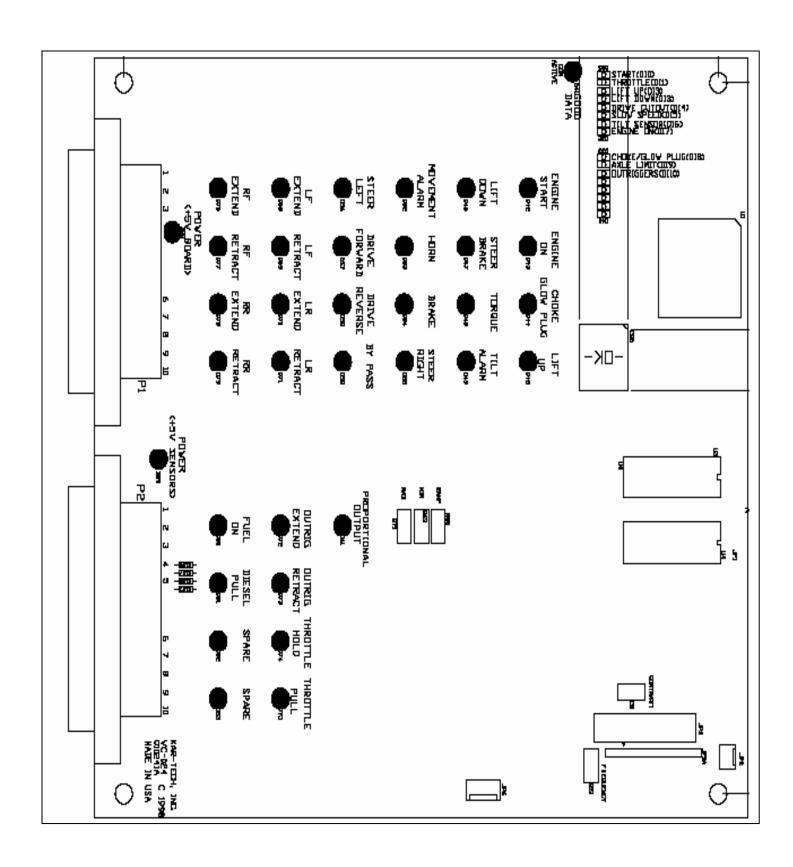
ITEM	PART NO.	QTY	DESCRIPTION
	40087	_	SHEET LOAD GATE
1	40003	1	LATCH PIN
2	7055	1	SPRING, LATCH
3	40006	1	ROD, LATCH LEVER
4	HDW7455	1	PIN, SLOTTED SPRING, 3/16" DIA X 3/4" LG
5	8187	2	BEARING, NYLINER, FLANGED
6	40014	1	MOUNTING BRACKET, UPPER
7	HDW8294	4	WASHER, FLAT
8	HDW8486	4	SCREW, 5/16" -18, 1 7/8" LG
9	6823	1	CAP PLUG, 1 1/4" SQUARE
10	8300	1	SPRING, TORSION, 1" OD, 4" LG
11	13272	1	BLOCK, PIVOT
12	40015	1	MOUNTING BRACKET, LOWER
13	40017	1	GATE, REAR WITH 6" KICK PANEL
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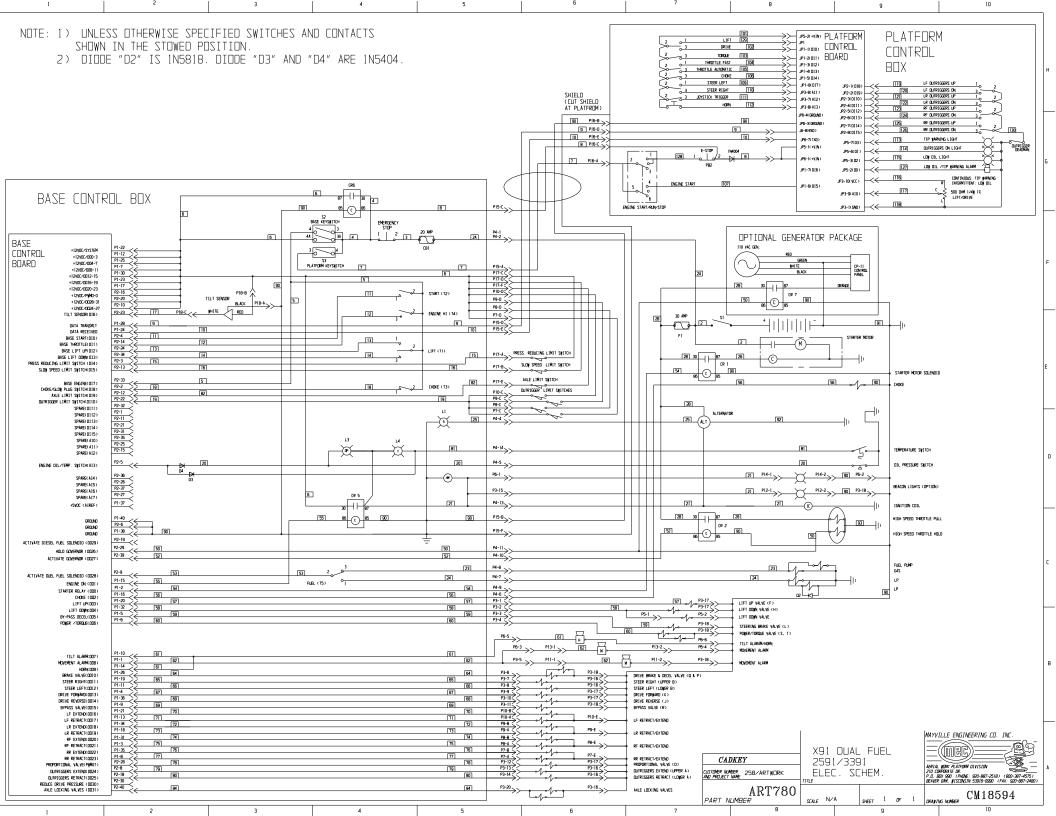


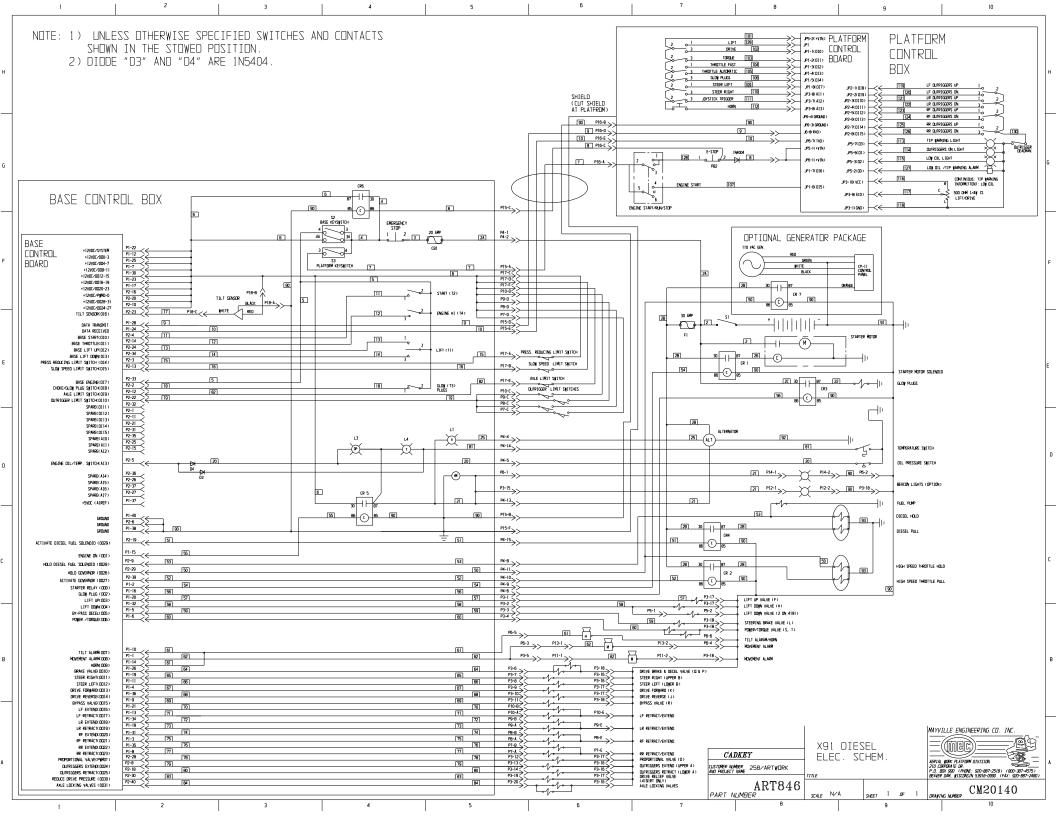
APPENDIX

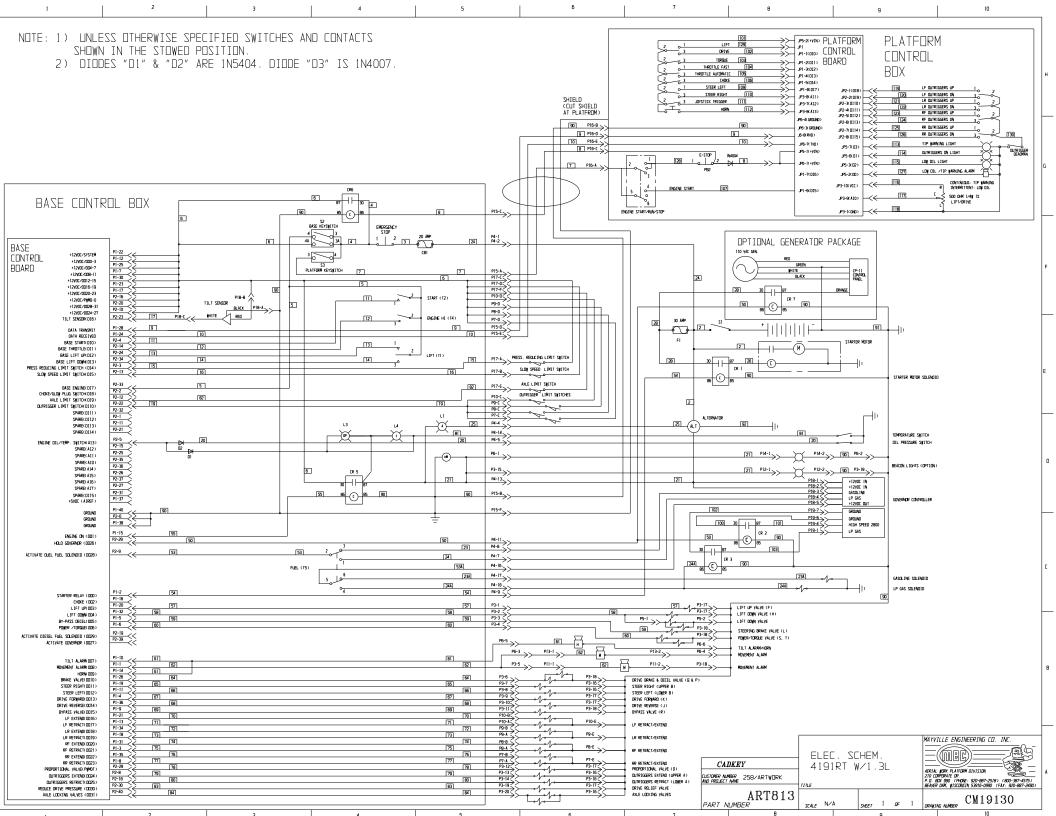
HYDRAULIC SCHEMATICS

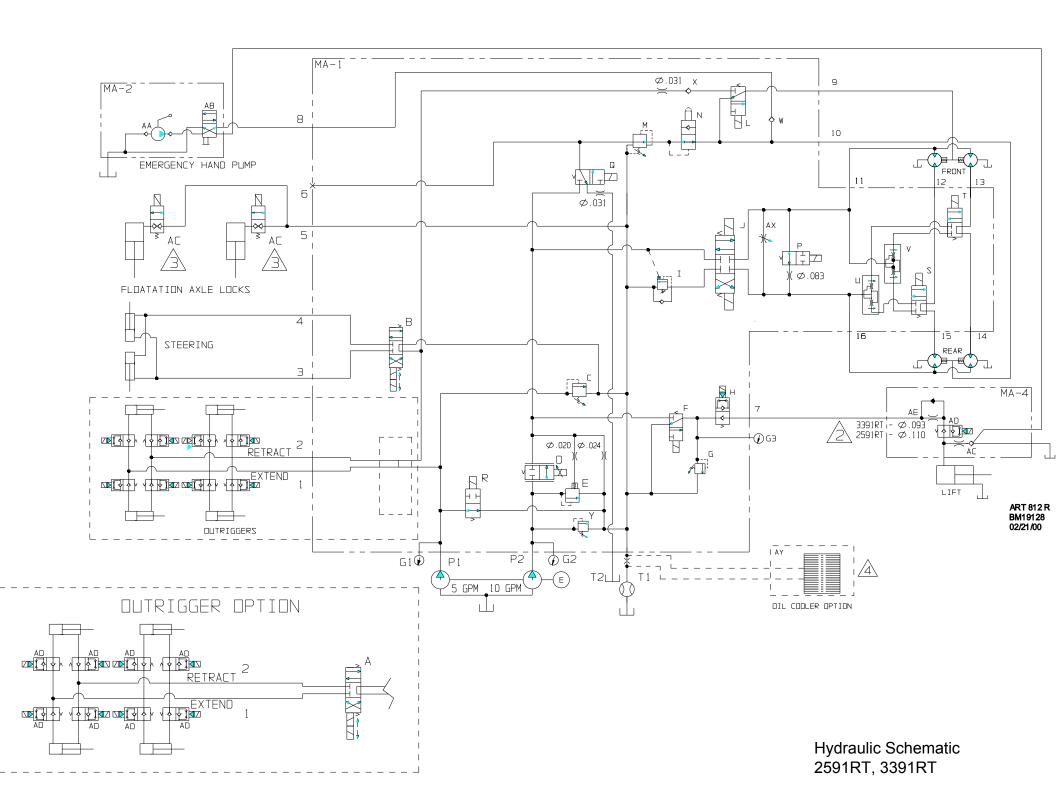
ELECTRICAL SCHEMATICS



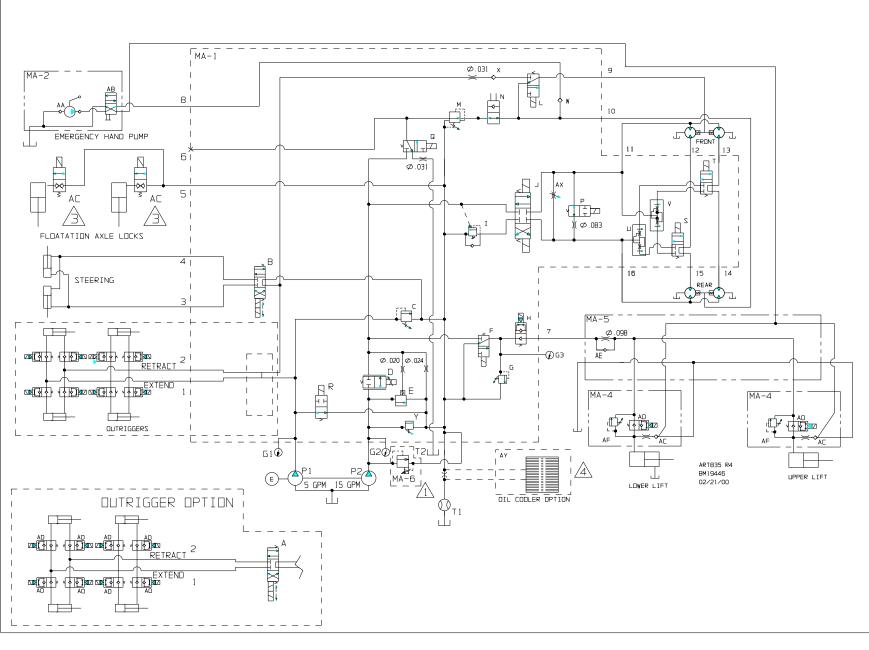








LETTER CALLOUT	MAYVILLE PART NO.	PART DESCRIPTION	VALVE - PRESSURE SETTINGS
MA-1	9445	MANIFOLD ASSY (10 GPM) WITH OUTRIGGERS	N/A
MA-1	9467	MANIFOLD ASSY (10 GPM) NO OUTRIGGERS	N/A
MA-2	20601	MANIFOLD ASSY E-DOWN	N/A
MA-4	20862	LIFT CYLINDER ASSY	N/A
Α	9041	4W3P TANDEM CENTER VALVE OUTRIGGERS	N/A
В	9041	4W3P TANDEM CENTER VALVE STEER	N/A
С	9664	RELIEF VALVE STEER	1500 PSI
D	9671	CARTRIDGE 4G SPOOL PROPORTIONAL	N/A
Е	9670	PRESSURE COMP REG VALVE	N/A
F	6976	3W2P SPOOL VALVE	N/A
G	9663	RELIEF VALVE 2591RT	2000 PSI
G	9663	RELIEF VALVE 3391RT LIFT	2250 PSI
Н	6973	2W NC VALVE DOWN	N/A
I	9669	COUNTERBALANCE VALVE	1500 PSI
J	9668	4W3P DO3 VALVE DRIVE DIRECTIONAL	N/A
L	6976	3W2P SPOOL VALVE FRONT BRAKE	N/A
М	9666	PRESSURE REDUCING VALVE	500 PSI
N	9665	MANUAL VALVE (FREE WHEELING)	N/A
P	6975	2W SPOOL VALVE DECEL	N/A
Q	6976	3W2P SPOOL VALVE BRAKE	N/A
R	9511	2W NO VALVE STEER DUMP	N/A
S	8373	4W2P TAN CTR SPOOL VALVE TORQUE	N/A
Т	8373	4W2P TAN CTR SPOOL VALVE TOR OUE	N/A
U	9667	FLOW DIVIDER/COMBINER	N/A
V	9667	FLOW DIVIDER/COMBINER	N/A
W	9504	CHECK VALVE	N/A
X	9504	CHECK VALVE	N/A
Y	9711	RELIEF VALVE MAIN	3000 PSI
AA	8849	HYDRAULIC HAND PUMP VALVE	N/A
AB	8848	MANUAL PULL 4-WAY VALVE	N/A
AC	90304	N.C. BI-DIRECTIONAL POPPET VALVE	N/A
AD	6973	N.C. POPPET 2-WAY VALVE	N/A
AE	9767	ORIFICE, UNIDIRECTION (.093) 3391RT	N/A
	9875	ORIFICE, UNIDIRECTION (.11) 2591RT	N/A
AX	9505	NEEDLE VALVE (FREE WHEELING)	N/A
	9672	COIL 12 VDC	N/A
	9519	COIL	N/A
	9520	COIL	N/A
AY	21129	OPTION-OIL COOLER	N/A



LETTER CALLOUT	MAYVILLE PART NO.	PART DESCRIPTION	VALVE - PRESSUR SETTINGS
MA-1	9656	MANIFOLD ASSY (15 GPM) WITH OUTRIGGERS	N/A
MA-1	9657	MANIFOLD ASSY (15 GPM) NO OUTRIGGERS	N/A
MA-2	20601	MANIFOLD ASSY E-DOWN	N/A
MA-4	20395	LIFT CYLINDER ASSY	N/A
MA-5	20589	JUNCTION BLOCK ASSEMBLY	N/A
MA-6	9926	REG, PRESS. TS10-26A-8T-N12DG ELEU DRIVE	1000 PSI
	9929	CARTRIDGE, PRESET TS10-26A-0-N-00	N/A
	9928	COIL, 12 VOLT W/DIN CONN.	N/A
A		4W3P TANDEM CENTER DUTRIGGERS	
В		HW3P TANDEM CENTER Steer	
C		RELIEF VALUE STEER	1500 PSZ
D		ZWNC VALVE PROPORTIONAL	
E	9670	PRESSURE COMP REG VALVE	N/A
F	6976	3W2P SPOOL VALVE LIFT	N/A
G	9663	RELIEF VALVE 2591RT LIFT	2000 PSI
Н	6973	2W NC VALVE DOWN	N/A
<u> </u>	9669	COUNTERBALANCE VALVE	1500 PSI
J	9668	4W3P DO3 VALVE DAIVE DIRECTIONA	
 L	6976	3W2P SPOOL VALVE FRONTBRAKES	N/A
M	9666	PRESSURE REDUCING VALVE	500 PSI
N	9665	MANUAL VALVE (FREE WHEELING)	N/A
Р	6975	2W SPOOL VALVE DECEL	N/A
Q	6976	3W2P SPOOL VALVE BRAKE	N/A
R	9511	2W NO VALVE STEER DUMP	N/A
S	8373	4W2P TAN CTR SPOOL VALVE TORRUE	N/A
Т	8373	4W2P TAN CTR SPOOL VALVE TORQUE	N/A
U	9667	FLOW DIVIDER/COMBINER	N/A
V	9667	FLOW DIVIDER/COMBINER	N/A
W	9504	CHECK VALVE	N/A
Χ	9504	CHECK VALVE	N/A
Υ	9711	RELIEF VALVE MAZN	3000 PSI
AA	8849	HYDRAULIC HAND PUMP VALVE	N/A
AB	8848	MANUAL PULL 4-WAY VALVE	N/A
AC	90304	N.C. BI-DIRECTIONAL POPPET VALVE	N/A
AD	6973	N.C. POPPET 2-WAY VALVE	N/A
Æ	9768	ORIFICE, UNIDIRECTION (.098)	N/A
AF	9769	RELIEF, TAMPER PROOF VALVE	2450 PSI
AX	9505	NEEDLE VALVE (FREE WHEELING)	N/A
	9672	COIL 12 VDC	N/A
	9519	COIL	N/A
	9520	COIL	N/A
AY	21129	OPTION-OIL COOLER	N/A

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 purchase 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.



