

OPERATIONS MANUAL AND PARTS BOOK



HD 550

HYDRA-DRIVE SERIES RIDING TROWEL

Riding Trowel

OPERATIONS

MANUAL

PARTS

BOOK

Printed 1/03

THIS MANUAL COVERS RIDING TROWEL(S) BELOW

MODEL

AEC Part #

HD 550-1500-HYD-87KB PSII

042467

Allen Engineering's Razorback Riding Trowels are covered under one or more of the following patent numbers: **U.S. Design Patents:** 323,510; 340,340; 344,736; 400,542; 402,998; 402,999; 403,332. **U.S. Utility Patents:** 4,298,555; 5,108,220; 5,480,257; 5,480,258; 5,613,801; 5,685,667; 5,803,658; 5,816,739; 5,890,833; 5,934,823; 6,053,660. **Canadian Patents:** 2,039,893. **French Patents:** 0293496. **German Patents:** M9007736.9 With other Patents Pending.

LIMITED WARRANTY

Allen Engineering Corporation warrants its products to be free of defects in material or workmanship for the following periods:

A. All New Machines and Part	6 Months
B. All New Gear Boxes	2 Years
C. All Factory Reconditioned Gear Boxes	1 Year

NOTICE: The engine RPM has been set at the factory at a maximum of 3,900. Any evidence of tampering to increase the RPM above 3,900 will immediately void the warranty with both Allen Engineering Corporation and the engine manufacturer.

Warranty period begins on first day of use by End User. This first day of use is established by a completed warranty card or a Bill of Sale to the end user. All warranty is based on the following limited warranty terms and conditions.

- 1.) Allen Engineering Corporation's obligation and liability under this warranty is limited to repairing or replacing parts if, after Allen's inspection, it is determined to be a defect in material or workmanship. Allen Engineering Corporation reserves the choice to repair or replace.
- 2.) If Allen Engineering Corporation chooses to replace the part, it will be at no cost to the customer and will be made available to the Distributor/Dealer from whom the customer purchased the product.
- 3.) Replacement or repair parts, installed in the product, are warranted only for the remainder of warranty period of the product as though they were the original parts.
- 4.) Allen Engineering Corporation's warranty applies only to the products that are manufactured by Allen Engineering and does not cover component parts such as engines and clutches. Allen Engineering Corporation DOES NOT warranty clutches. Engine warranty claims should be made directly to an authorized factory service center for the particular engine make.
- 5.) Allen Engineering Corporation's warranty does not cover the normal maintenance of products or its components (such as engine tune-ups and oil changes). The warranty also does not cover normal wear and tear items (such as belts and consumables).
- 6.) Allen Engineering Corporation's warranty will be void if it is determined that the defect resulted from operator abuse, failure to perform normal maintenance on the product, modification to product, alterations or repairs made to the product without the written approval of Allen Engineering Corporation. Allen Engineering Corporation specifically excludes from warranty any damage to any trowels resulting from an impact to the rotors. Allen Engineering Corporation also excludes from warranty any failure of clutches on any engine driven piece of equipment.
- 7.) If a new gear box has a factory defect within the first year of use, Allen Engineering Corporation will either repair the gear box or replace it with a new gear box. If a new gearbox has a factory defect in the second year of use, Allen Engineering Corporation will either repair it or replace it with a factory reconditioned gear box. Impact damage is NOT covered under the gear box warranty.
- 8.) Allen Engineering Corporation will pay shop labor repair on warranty at the Allen Engineering Shop Labor Rate in existence on the date of the warranty claim. An Allen Engineering Labor Chart will determine the time allowed to complete a repair and will govern the shop labor hours that will be allowed.
- 9.) Allen Engineering Corporation will pay freight on warranty replacement parts at Worldwide standard ground rates. No warranty replacement parts will be shipped air freight at the expense of Allen Engineering Corporation. Allen Engineering only pays outbound freight charges when sending warranty replacement parts to the customer VIA ground service. Allen Engineering does not pay any inbound freight, however, if Allen Engineering determines this to be warranty defect only then will Allen Engineering reimburse the customer for inbound freight at standard ground rates.
- 10.) Allen Engineering Corporation's warranty policy WILL NOT COVER the following; taxes, shop supplies, environmental surcharges, air freight, travel time, loss of rental revenue, or any other charges whatsoever or any liabilities for direct, incidental, or consequential damage or delay.
- 11.) **Allen Engineering Corporation makes no other warranty, expressed or implied. This limited warranty is in lieu of the warranty of merchantability and fitness. There are no other warranties that extend beyond the description on this document.**
- 12.) No Allen Engineering Corporation employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by an officer of Allen Engineering Corporation.

OPERATIONS IDENTIFICATION PLATE

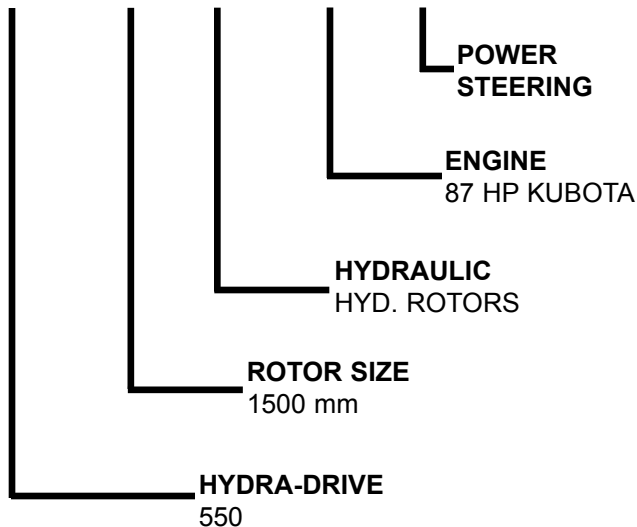
1A OPERATIONS

An identification plate listing the Model Number and Serial Number is attached to each unit and is located on the left side of the mainframe. The plate should not be removed.

Please record the information found on this plate below so it will be available should the identification plate become lost or damaged . When ordering parts or requesting service information you will always be asked to specify the model number and serial number of the unit.

Model Number

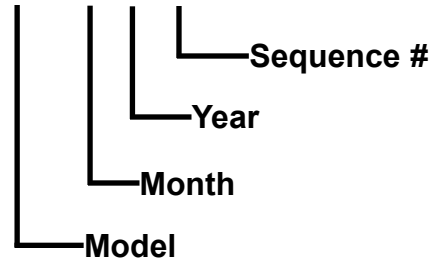
HD550-1500-HYD-87KB-PSIII



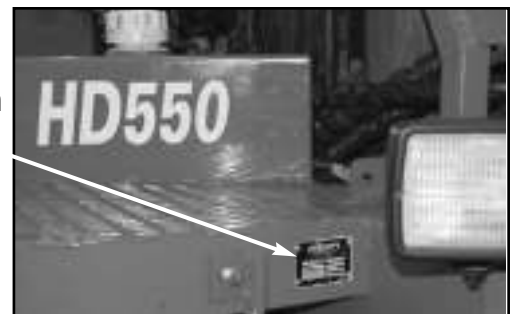
Serial Number

The serial number found on the identification plate is a six digit number. The model number identifies your machine and will ensure that you receive the correct replacement parts.

SAMPLE: **5501102001**



Identification
Plate
Location



Serial #
Location



FILL IN FOR FUTURE REFERENCES

Model Number: _____

Serial Number: _____

Date Purchased: _____

Purchased From: _____

**HD550-1500-HYD Operating Information
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This machine is built with user safety in mind. However, it can present hazards if improperly operated and serviced. Follow operating instructions carefully!

If you have any questions about operating or servicing this equipment please contact your Allen Engineering Distributor or Allen Engineering Corp. Customer Service at 800-643-0095 or 870-236-7751.

Important Reminder

1A OPERATIONS

Complete any warranty requirements as specified by the engine manufacturer in their instructions found inside the battery box.

Your engine and clutch is not manufactured by Allen Engineering Corp., and therefore is not covered under Allen Engineering warranty.

Your engine manufacturer should be contacted if you wish to purchase a parts manual or a repair manual for your engine.

Refer to enclosed owners engine manual for complete O&M instructions. See your battery manufacturer for battery warranty.

Your Distributor

Your Distributor has Allen Engineering trained mechanics and original Allen Engineering replacement parts. Always contact the Allen Engineering Distributor who sold you this machine for Allen Engineering Certified repairs and replacement parts.

Place distributor information here for future reference.

DISTRIBUTOR NAME: _____	PHONE #: _____ - _____	
ADDRESS: _____		
CITY: _____	STATE: _____	ZIP: _____
SALESMAN: _____		
ADDITIONAL INFORMATION: _____		

1A OPERATIONS

THE INFORMATION CONTAINED IN THIS MANUAL WAS BASED UPON THE MACHINES IN PRODUCTION AT THE TIME (BEGINNING WITH SERIAL NUMBERS 5500702001) OF PUBLICATION. ALLEN ENGINEERING RESERVES THE RIGHT TO CHANGE ANY PORTION OF THIS DOCUMENT WITHOUT NOTIFICATION.

Information Contained in This Manual

This manual provides information and procedures to safely operate and maintain the Allen® HD550-1500-HYD-87KB-PSIII Model Riding Trowel.

For your own safety and protection from personal injury carefully read, understand and observe the safety instructions described in this manual.

Always operate and maintain this machine in accordance with the instructions described in this manual. A well maintained piece of equipment will provide many years of trouble free operation. This manual is divided into the sections listed below.

1A
OPERATIONS

2A
PARTS

Ordering Parts

This manual contains an illustrated parts list for help in ordering replacement parts for your machine. Follow the instructions listed below when ordering parts to ensure prompt and accurate delivery. All orders for parts must be made through your local authorized Allen Engineering dealer. All authorized Allen Engineering dealers must fax a copy of the parts order to customer service. The fax number is (870-236-3934). Facsimile orders must contain the following information:

1. On all orders for service parts include SERIAL NUMBER and MODEL number.
2. Shipment may be delayed if this information is not included.
3. Include correct description and part number from part section 2A.
4. **State exact shipping instructions including preferred routing and complete destination address. Also please indicate your preferred freight carrier. If no freight carrier is indicated Allen Engineering reserves the right to ship the shipment the best way possible. Once a shipment leaves Allen Engineering's docks it becomes the responsibility of the freight carrier to insure that it arrives at it's intended destination.**
5. **DO NOT** return parts to Allen Engineering without receiving written authorized Customer Service Report(CSR) from Allen Engineering. All authorized returns must be shipped prepaid. **All unauthorized returns will be shipped back to the addressee at their expense.**

Keep this manual or a copy of it with the machine. If you loose this manual or need an additional copy please contact your Allen distributor or Allen Engineering Corporation at (800) 643-0095 and order literature part number 043309.

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1.1 Safety Notes

This manual contains NOTES, CAUTIONS and WARNINGS which must be followed to reduce the possibility of improper service damage to the equipment or personal injury. Read and follow all NOTES, CAUTIONS and WARNINGS included in this manual.

NOTE Contains additional information important to a procedure.

CAUTION Provides information important to prevent errors which could damage machine or components.

WARNING Warns of conditions or practices which could lead to personal injury or death.

1.2 Operating Safety

Familiarity and proper training are required for the safe operation of this equipment! Equipment operated improperly or by untrained personnel can be dangerous! Read the operating instructions contained in both this manual and the engine manual and familiarize yourself with the location and proper use of all controls.

Safety Precautions

1. Read operating and safety instructions before using the Riding Trowel. Operate the machine in accordance with the manufacturer's instructions.
2. Inspect your Riding Trowel for damage or tampering that can sometimes occur during shipping.
3. **If damage is found file a claim with your carrier immediately! Mark freight bill of lading as damaged shipment.**
4. Do not operate Riding Trowel if any guards have been removed or if the "safety switch" is not operational.
5. Only trained personnel should be allowed to operate your Riding Trowel.
6. Never allow more than one person on the Riding Trowel while it is in operation.
7. No foreign objects such as buckets, tools or materials should ever be attached or allowed to ride on the Trowel during operation.
8. Do not attempt to fill fuel tank or oil sump while the engine is running. Allow engine to cool before refueling.
9. Never attempt to operate the Riding Trowel on steep inclined surfaces.
10. Do not use over the counter hardware to replace manufacturer's hardware.
11. **WARNING: When operating machines with gas engines in confined areas. The fumes MUST be ventilated!**
12. Always wear safety goggles, ear protection, and gloves when operating the Riding Trowel.

1A OPERATIONS

1.3 Service Safety

Poorly maintained equipment can become a safety hazard! In order for the equipment to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

DO NOT attempt to clean or service machine while it is running. Rotating parts can cause severe injury.

DO NOT use gasoline or other types of fuels or flammable solvents to clean parts especially in enclosed areas. Fumes from fuels and solvents can become explosive and can be hazardous to your health.

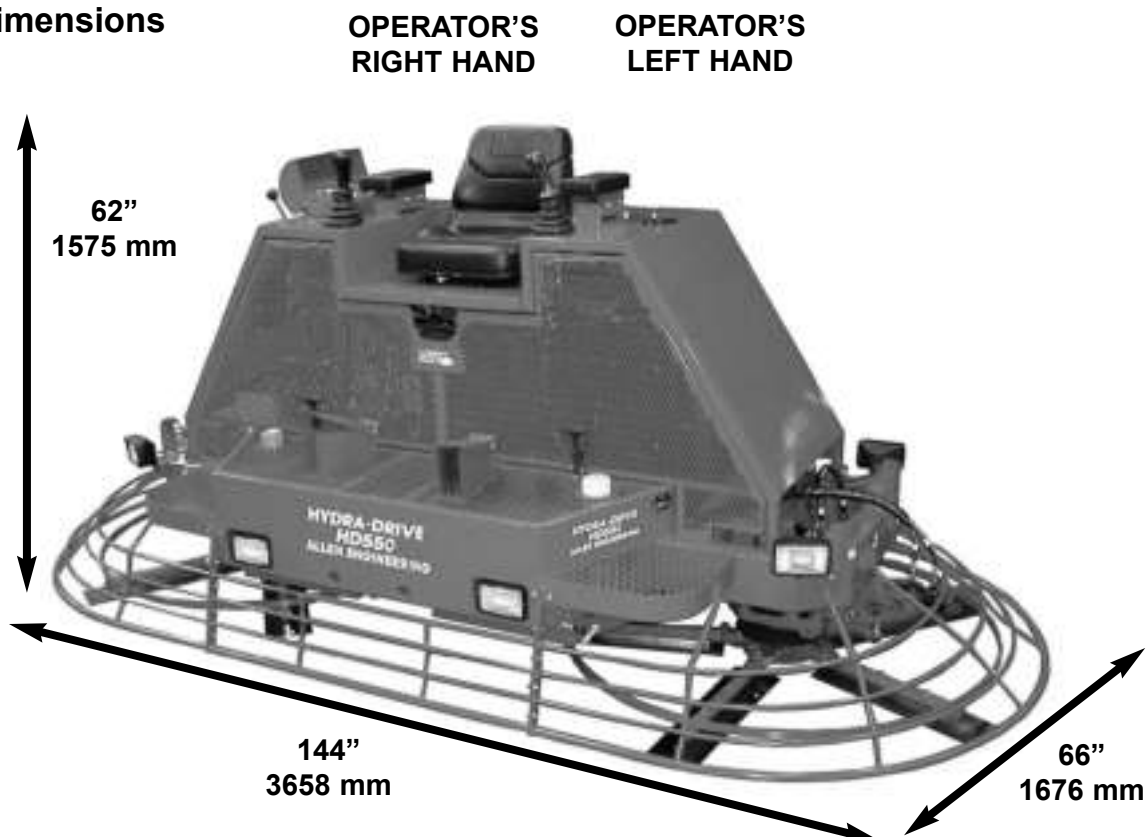
ALWAYS operate machine with all safety devices and guards in place and in working order.

ALWAYS keep area around muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite such items starting a fire.

ALWAYS replace worn or damaged components with spare parts designed and recommended by ALLEN ENGINEERING.

ALWAYS remove key and disconnect battery on machines before servicing to avoid accidental start-up.

1.4 Dimensions



1.5 Technical Data

1A OPERATIONS

HYDRA-DRIVE MODEL	550-1500-HYD-87KB-PS III
Dimensions (LxWxH) (w/o seat, levers, pitch control)	144" (3,658mm) x 66" (1,676mm) x 62" (1,575mm)
Panning Path Width	139" (3,531mm)
Two Rotors (diameter)	60" (1,524mm) Non-Overlapping (NOL)
Rotor Speed	130
Weight	2500 lbs. (1,133kg)
Ten Finish Blades	6" x 23" Finish
Hydra-Drive Rotor Motor (2)	Radial Piston Multi-Stroke
Hydra-Drive Hook-Ups (2)	Bolt On Stub-Shaft
Hydra-Drive Pump System (2)	Variable Displacement, Axial Piston Pump
Hydra-Drive Fluid Cooling System (2)	Air/Oil Fan Cooled Heat Exchanger
Hydra-Drive Filtering System	Inline Suction, Return, Charge, 10 Micron
Hydra-Drive Rotor Speed Control	Foot Pedal Pilot Control
Engine Speed Control	Lever Style (Self Locking)
Guard Rings	Detachable - Bolt On Style
Operator Control Panel	Vandal Proof, Lockable Cover
Power Retardant Spray System/Capacity	Pump Powered Two Nozzles / 9 gal. (34lit.)
Steering Control System	Proportional Hydraulic Pilot Control w/ Zero Position Neutral
Pitch Control	Two Push Button Electro-Hydraulic System Joy Stick Mounted
Battery	12 Volt, 525 Cold Cranking Amps
Safety Shutdown Switch	Foot Pedal Electronic Switch Control
Hydraulic Fluid Capacity	20 gal. (75.7lit.)
Fuel Capacity	18 gal. (68.1lit.)
Approx. Running Time Between Fueling	3.5 Hours
Engine Hour and RPM Meter	Analog
Oil Pressure	Gauge Style w/ Auto Shutdown
Engine Temperature	Gauge Style w/ Auto Shutdown
Alternator Engine Mounted	60 Amps
Lights	Six(6) - 50 Watt
Amperage	65 Amps
Nylon Strap Lifting Bridle	Standard
ENGINE: Kubota (KB) (liquid-cooled)	87 HP (64.88kw) @ 2,600 RPM
Engine Weight	551 lbs (250kg)
OPTIONAL FEATURES:	
Ten Flat Finish Blades	8" x 23" w/ Rounded Corners
OPTIONAL ACCESSORIES:	
Sun Screen Umbrella	HD 550 Recommended
Trowel Cover	HD 550 Recommended
Dolly Jacks	HD Series Recommended
Riding Trowel Trailer	6' x 12' Recommended
Two Pans	1500 Series / 60" (1,524mm)
Trowel Arm Jig	Available
Spider Pulling Tool	Available

Engine Make & Model	Kubota 87HP V3300-T
Gross Intermittent output	.kW(HP)/rpm 65.2(87.4)/2,600
Net Intermittent output	.kW(HP)/rpm 61.9(83.0)/2600
Net Continuous output	.kW(HP)/rpm 53.8(72.1)/2,600
Fuel and type	.Diesel, No. 2-D
Cylinder arrangement	.4 in-line
Bore x Stroke	.mm x mm 98 x 110
Total piston displacement	.cc 3,318
Compression ratio	..... 21.8
Length x width x height (standard model)	.mm 743 x 545 x 793
Dry weight (standard model)	.kg/lb 250/551

1A OPERATIONS

1.6 Description

The Riding Trowel is a modern high production machine. Finishing rate will vary depending on the operators skill and job conditions. The Riding Trowel has ten finishing blades. The *Hydra-Drive Rotor Motors* are designed to provide exceptional performance with low maintenance and trouble free use under some of the worse conditions. All Allen® Riders are equipped with a safety shutdown switch and a low oil shut down for added job safety and engine protection. Operating time between fuel refills is approximately 3.5 hours with a rotor speed of 130 RPM for the HD550-1500-HYD. The Hydra-Drive Series Riders are the most technically advanced trowels on the market today. With proper maintenance and use your riding trowel will provide you with exceptional service.

1.7 Before Starting

Before starting trowel check the following:

- * Oil level in engine:
- * Oil level in trowel gearboxes:
- * Fuel level :
- * Condition of air filter:
- * Condition of trowel arms and blades:
- * Grease trowel daily:



1.8 Starting

Before starting trowel refer to drawing above for location and identification of controls.

1. Sit down correctly on the Riding Trowel Seat. DO NOT attempt to start the Riding Trowel with out an operator in the seat.
2. Place left foot on the safety switch pedal located on the operators left hand side. Press down gently engaging the safety switch and maintain slight pressure.
3. Turn key clockwise until the engine engages and starts
4. Turn key to the run position. Allow engine to warm up before operating trowel.

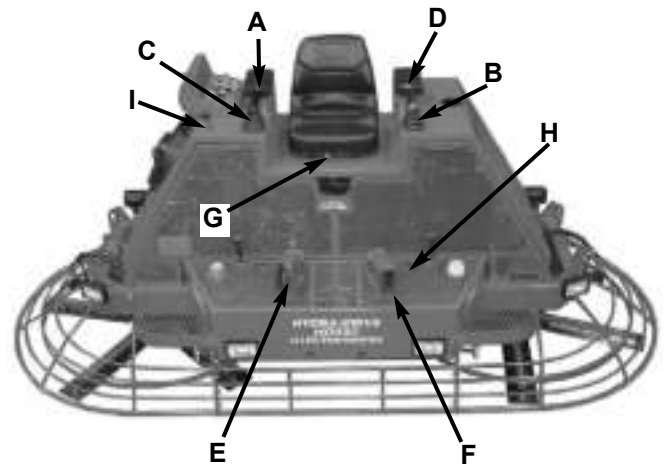
Caution: Operating the starter for more than 5 seconds can damage the starter or engine. If engine fails to start release the switch and wait 10 seconds before operating starter again.

1.9 Operating

To utilize your Allen® Rider to its fullest capacity the machine should be driven in the direction the operator is facing. This will finish the widest possible area while giving the operator an excellent view of the slab surface about to be troweled. When the machine reaches the end of the slab make a 180 degree turn and repeat the straight line of direction to the other end of the slab. To familiarize a new operator with the Riding Trowel the following steps should be taken.

1. Point out the location of all Controls

- A. right pitch control
- B. control lever (forward reverse)
- C. control lever (left & right, forward & reverse)
- D. left pitch control
- E. right foot pedal (rotor control)
- F. left foot pedal (safety switch)
- G. seat adjustment
- H. fuel gauge
- I. engine throttle lever



2. With the operator in the seat, show him the functions of the control levers (B) and (C) and how to start the machine. (refer to page 1A-10)

A hard level concrete slab with water on the surface is an idea place for an operator to practice with the machine. For practice pitch the blades up approximately 1/4" on the leading edge. Start by making the machine hover in one spot and then practice driving the machine in a straight line and making 180 degree turns. Best control is achieved at full RPM.

CAUTION: After starting engine fully engage the throttle. This allows the engine and the hydraulic fluid to warm up quicker. **NOTE:** If you start out at a low RPM this will cause the machine to have a slower reaction time between movement of the joysticks and the rotors.

CAUTION: DO NOT use excessive pressure on the joysticks (Power Steering). Excessive pressure does not increase the reaction time of the machine and can damage steering controls.

1.10 Stopping

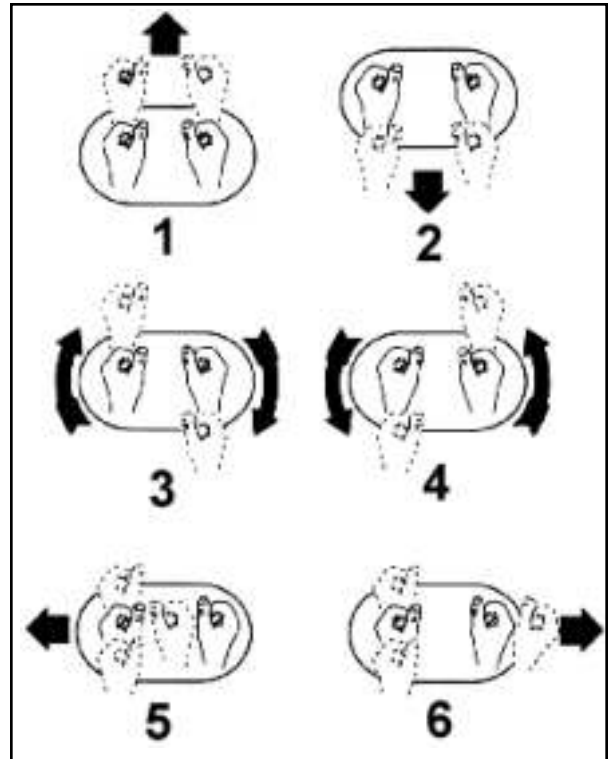
To stop the trowel's movement, return the control levers (C) and (B) to their neutral position and release pressure on the right foot pedal (E). You will need to pull the engine throttle lever (I) towards the rear of the machine. This will reduce the speed of the engine. It is not recommended to leave the engine throttle lever in the forward position if the rotors are not turning.

1A OPERATIONS

1.11 Steering

A slight "feathering motion" forward and backward with the left hand control lever is required to move the machine in a straight path to the left or right while operating the right hand control lever. See illustration.

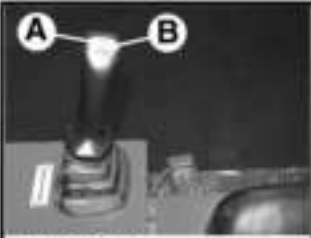




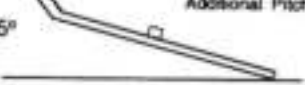

- 1> forward
- 2> reverse
- 3> rotate clockwise
- 4> rotate counter clockwise
- 5> left sideways
- 6> right sideways



1.12 Pitch Adjustment

Different pitch angles are needed as you work the different stages of the concrete. See the drawing below. When changing or setting pitch (angle of trowel blades), set the desired degree of pitch on the left side of the machine and then adjust the right side to match.

To increase the pitch, press the gray pitch control button (b) which is located on top of joystick towards the inside. To decrease the pitch, press the pitch control button (a) which is located on top of joystick towards the outside.

 LH SOM	Working Conditions of Concrete	Suggested Working Pitch
	① Wet surface working stage	 Flat (No Pitch)
	② Wet plastic working stage	 5° Slight Pitch
RH SOM	③ Plastic working stage	 10° Additional Pitch
	④ Semi-hard working stage	 15° Additional Pitch
	⑤ Hard finishing stage (burnishing)	 20° Maximum Pitch

1.13 Periodic Maintenance Schedule

The chart below list basic trowel and engine maintenance. Refer to engine manufacturer's Operation Manual for additional information on engine maintenance. A copy of the engine Operator's Manual was supplied with the machine when it was shipped. To service the engine, unhook the rubber hood latches and remove the front and rear screen.

	Daily	Every 20 Hours	Every 50 Hours	Every 100 Hours
Grease Trowel Arms	X			
Check Fuel Level	X			
Inspect Air Filters Replace as Needed	X			
Check and Tighten External Hardware	X			
Grease Thrust Bearing	X			
Check Hydraulic Oil/Filter Refer to Page 1A-19	X			
Grease Control Linkage		X		
Check Valve Clearance			X	
Change Engine Oil				X
Replace Oil Filters				X

1.14 Control Linkage Lubrication

The control linkage is equipped with several grease fitting to lubricate pivot points. Grease control linkage once a week or every 20 hours to prevent wear and ensure free movement and smooth response of control levers.

Use a general purpose grease and add one to two shots of grease to each fitting.

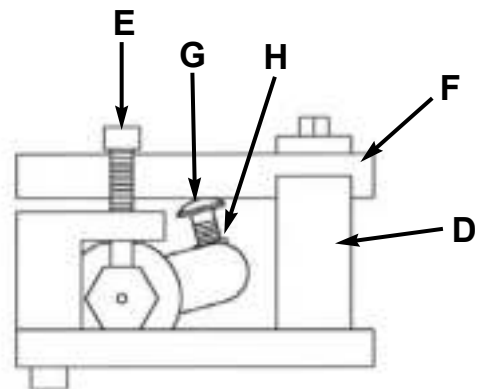
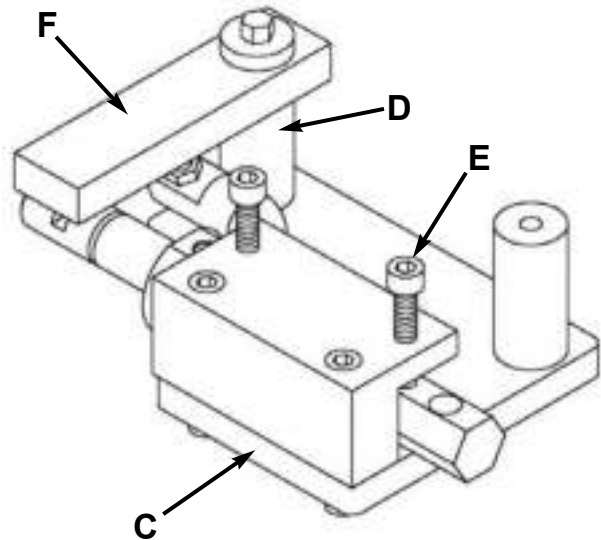
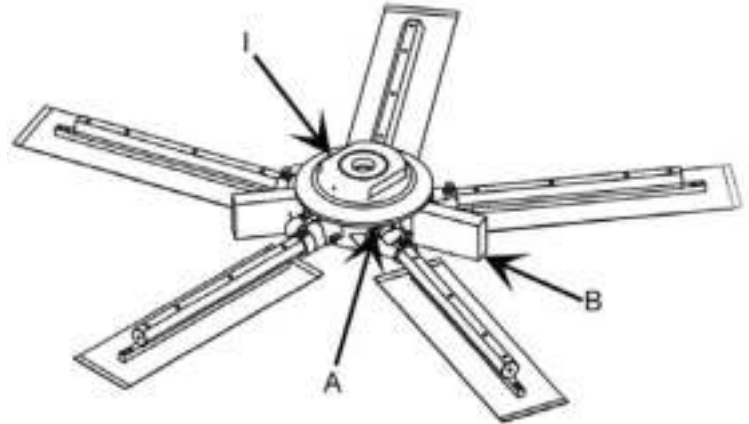
1A OPERATIONS

1.15 Lift Lever Adjustment

Damage to or replacement of a trowel arm can change the adjustment of the lift lever. This can unbalance the trowel arms and cause the trowel to wobble during operation. To operate smoothly the lift lever on all arms must be adjusted the same to ensure that the trowel is balanced correctly. Adjust trowel arms using optional trowel arm jig as described below.

NOTE: Make sure that there is no pitch in the blades before attempting to remove a trowel arm.

1. Block up pressure plate (I) using wooden blocks (B).
2. Remove stabilizer ring from spider assembly (only on available models).
3. Remove blades from trowel arms.
4. Loosen hex head cap screw (A) and remove it and the external star washer from the spider boss.
5. Remove trowel arms from spider 4-boss with lift levers in place.
6. Clean flats on trowel arm before placing it in the trowel arm jig (PART# 016863).
7. For HD550 series trowels use the medium spacer (1-1/4 X 2-1/2) (D).
8. Insert trowel arm into trowel arm jig as shown.
9. Tighten socket head bolts (E) down on the trowel arm to hold in place.
10. Place carriage bolts (G) on lift lever under the trowel arm jig (F) as shown.
11. Loosen jam nut (H) and adjust the carriage bolt so that the top of the bolt is just touching the bottom of the trowel arm jig and tighten jam nut (H).
12. Attach trowel arm to spider boss and blades to arms.
13. Tighten down hex head cap screw to secure arm in place.
14. Reattach stabilizer ring (only on available models).



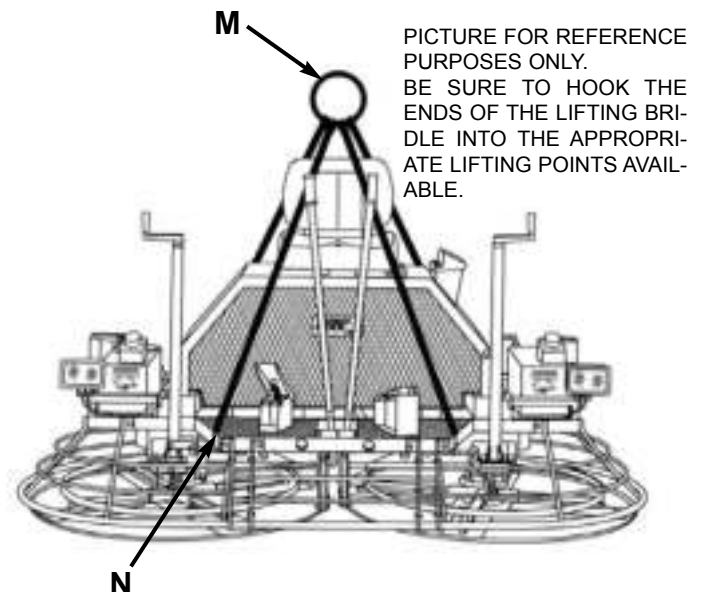
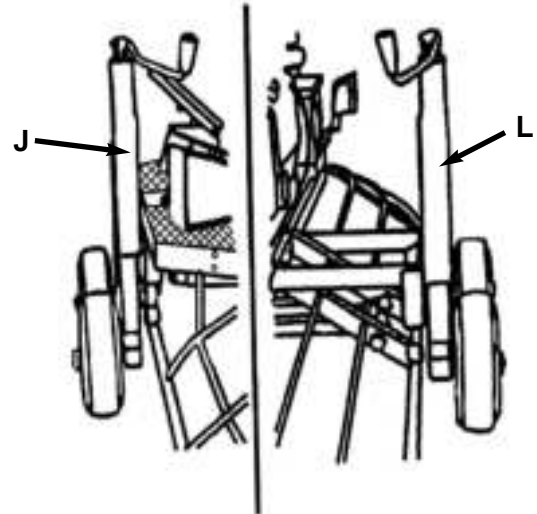
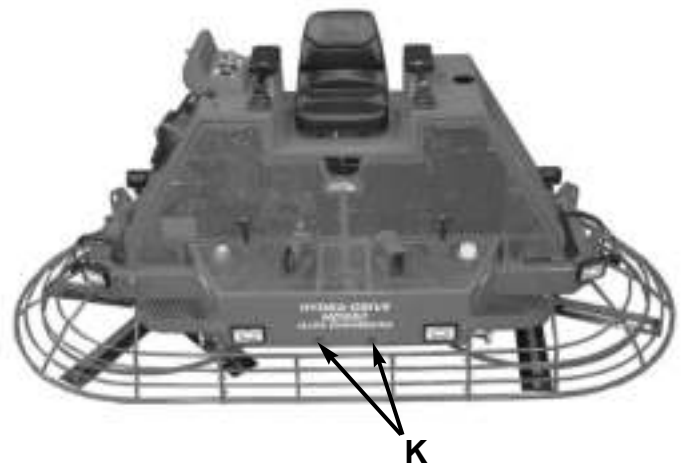
1.16 Transporting Trowel

Optional dolly jacks are available for short moves or to aid in servicing the trowel. Install dolly jacks as follows:

1. Inspect dolly jack for serviceability and damage.
2. Place riding trowel on firm level ground.
3. With the front dolly jack (J) fully insert extension tube in the holes (K) in the mainframe of the riding trowel. The front dolly jacks are equipped with short lifting tubes while the rear dolly jacks have long lifting tubes.
4. Insert the dolly jacks(L) with the long lifting tubes into the holes provided in the rear of the mainframe. The holes in the mainframe are located directly opposite the front holes.
5. Turn jack handles clockwise to lift trowels and counter-clockwise to lower trowel.

CAUTION:

The dolly jack lifting system is designed for short moves and to aid in servicing the trowel. It is not a substitute for a towing system or trailer. An optional lifting bridle (M) is available and recommended for lifting the trowel. Attach the bridle to each of the four lifting eyes (N) on the trowel.



1A OPERATIONS

1.17 Battery Jump Start Procedure

Occasionally it may be necessary to jump start a weak battery. If jump starting is necessary the following procedure is recommended to prevent starter damage, battery damage, and personal injury.

Warning: Jump starting a battery incorrectly can cause the battery to explode resulting in severe personal injury or death. Do not smoke or allow any ignition sources near the battery and do not jump start a frozen battery.

Warning: Electrical arcing can cause severe personal injury. Do not allow positive and negative cable ends to touch.

1. Use a battery of the same voltage (12V) as is used with your engine.
2. Attach one end of the positive booster cable (red) to the positive (+) terminal of the booster battery. Attach the other end of the terminal of your engine battery.
3. Attach one end of the negative booster cable (black) to the negative (-) terminal on the booster. Attach the other end of the negative cable to your engine battery.
4. Jump starting in any other manner may result in damage to the battery or the electrical system.

Caution: Over cranking the engine can cause starter damage. Allow 5 minutes for starter to cool if engaged for more than 15 seconds.

Caution: When using lights or high amperage draw accessories, idle the engine for a period of 20 minutes to bring the battery to charge state.

1.18 Greasing Thrust Bearing

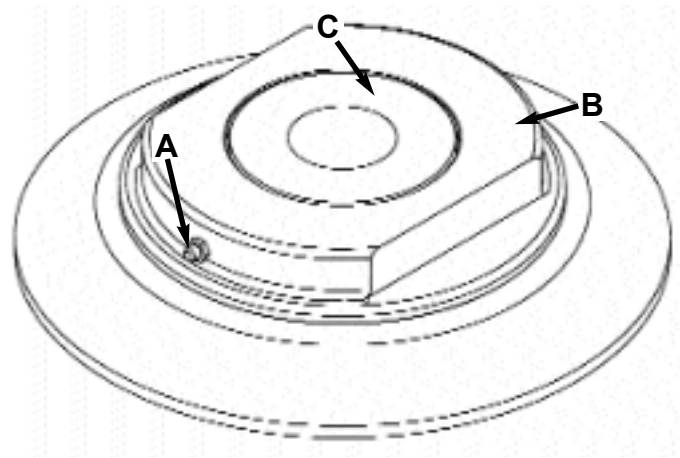
Step 1: Remove red plastic caps covering fittings (A).

Step 2: Properly seat grease nozzle on grease fitting.

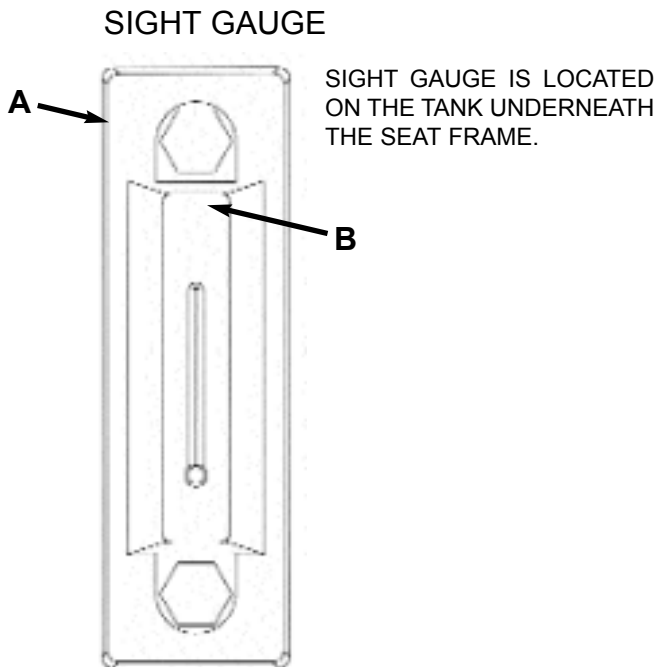
Step 3: Add grease to pressure plate cap (B) and the pressure plate (C).

Step 4: Add grease everyday of operation.

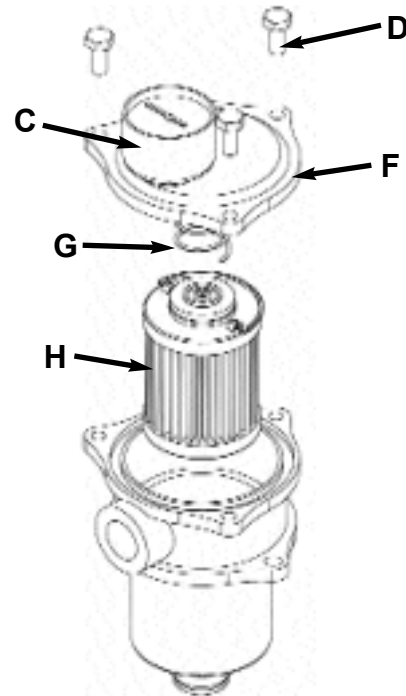
NOTE: It is imperative that this bearing be re-greased after every clean -up especially if you use a high pressure washer. If this is not done on a daily basis, you will increase the chance of mechanical failure. Any failures due to lack of grease in the thrust bearing will not be covered under warranty.



1.19 Hydraulic Preventive Maintenance



FILTER ASSEMBLY-039666 (E)



1. On a daily basis, check for leaks around all hydraulic fittings. Tighten if necessary.
2. On a daily basis, check hydraulic hoses for any wear that might occur during operations.
3. On a daily basis, visually inspect for scoring on cylinder rod ends.
3. On a daily basis, check the hydraulic fluid level on the sight/temperature gauge (A). If you can see that the oil is not all the way to the top of the sight glass (B), then you will need add more hydraulic fluid using Mobil DTE 25 hydraulic fluid or equivalent. If temperature of hydraulic oil rises above 160 degrees, check to make sure the hydraulic oil is full. Also check to make sure that no damage is done to the cooler or any other hydraulic components. If the problem still persist then contact Allen Engineering Customer Service.
4. On a daily basis, check the gauge-039665 (C) located on top of the hydraulic oil tank. If the needle on the gauge reaches 20 PSIG or is in the red, then the oil filter is dirty and needs to be replaced. Replace with Filter part number 039664.

Steps for Replacing Filter:

 - > First remove the three bolts (D) located on top the the filter assembly-039666 (E). Be sure to hold slight pressure on the cap (F). There is a spring (G) located underneath the cap.
 - > Next remove and replace the filter-039664 (H).
 - > Replace the cap and bolts. Tighten snug to ensure that the o-ring is properly seated.

Note: If you do not experience any problems with the filter, it is a good practice to replace the filter on a annual basis.
5. On a yearly basis, grease joystick mechanisms. Also check for tears and cracks in the rubber boots.
6. On a yearly basis, it is recommended to change hydraulic oil. It will take 20 gallons of Mobil DTE 25 hydraulic oil or equivalent fluid to completely change out the hydraulic oil system of your rider.

1.20 Hydraulic Troubleshooting

Many of the failures in a hydraulic system show similar symptoms: a gradual or sudden loss of high pressure, resulting in loss of power or speed in the cylinders. In fact, the cylinders may stall under light loads or may not move at all. Often the loss of power is accompanied by an increase in pump noise, especially as the pump tries to build up pressure. Any major component (pump, relief valve, directional valve, or cylinder) could be at fault. In a sophisticated system other components could be at fault, but this would require the services of an **experienced technician**. By following an organized step-by-step testing procedure in the order given here, the problem can be traced to a general area, then if necessary, each component in that area can be tested or replaced.

STEP 1 - Pump Suction Strainer ...

Probably the field trouble encountered most often is cavitation of the hydraulic pump inlet caused by restriction due to a dirt build-up on the suction strainer. This can happen on a new as well as an older system. It produces the symptoms described above: increased pump noise, loss of high pressure and/or speed.

If the strainer is not located in the pump suction line it will be found immersed below the oil level in the reservoir. Some operators of hydraulic equipment never give the equipment any attention or maintenance until it fails. Under these conditions, sooner or later, the suction strainer will probably become sufficiently restricted to cause a breakdown of the whole system and damage to the pump.

The suction strainer should be removed for inspection and should be cleaned before re-installation. Wire mesh strainers can best be cleaned with an air hose, blowing from inside out. They can also be washed in a solvent which is compatible with the reservoir fluid. Kerosene may be used for strainers operating in petroleum base hydraulic oil. Do not use gasoline or other explosive or flammable solvents. The strainer should be cleaned even though it may not appear to be dirty. Some clogging materials cannot be seen except by close inspection. If there are holes in the mesh or if there is mechanical damage, the strainer should be replaced. When reinstalling the strainer, inspect all joints for possible air leaks, particularly at union joints. There must be no air leaks in the suction line. Check the reservoir oil level, with all cylinders extended. If it does not cover to this depth there is danger of a vortex forming which may allow air to enter the system when the pump is running.

STEP 2 - Pump and Relief Valve ...

If cleaning the pump suction strainer does not correct the trouble, isolate the pump and relief valve from the rest of the circuit by disconnecting the hydraulic lines so that only the pump, relief valve, and pressure gauge remain in the pump circuit. Cap or plug both ends of the plumbing which was disconnected. The pump is now deadheaded into the relief valve. Start the pump and watch for pressure build-up on the gauge while tightening the adjustment on the relief valve. If full pressure can be developed, obviously the pump and relief valve are operating correctly, and the trouble is to be found further down the line. If full pressure cannot be developed in this test, continue to STEP 3.

STEP 3 - Pump and Relief Valve ...

If high pressure cannot be obtained in STEP 2 by running the pump against the relief valve, further testing must be conducted to see whether the fault lies in the pump or in the relief valve. Proceed as follows:

If a flow meter is available, the flow can be measured and compared with the pump catalog rating. If a flow meter is not available, the rate of flow on small pumps can be measured by discharging the hose into a bucket while timing with a watch. For example, if a volume of 10 gallons is collected in 15 seconds, the pumping rate is 40 GPM, etc.

If the gauge pressure does not rise above a low value, say 100 PSI, and if the volume of flow does not substantially decrease as the relief valve adjustment is as instructed in STEP 5. If the oil substantially decreased as the relief valve adjustment is tightened, and if only a low or moderate pressure can be developed, this indicates trouble in the pump. Proceed to STEP 4.

STEP 4 - Pump ...

If a full stream of oil is not obtained in STEP 3, or if the stream diminishes as the relief valve adjustment is tightened, the pump is probably at fault. Assuming that the suction strainer has already been cleaned and the inlet plumbing has been examined for air leaks, as in STEP 1, the oil is slipping across the pumping elements inside the pump. This can mean a worn-out pump, or too high an oil temperature. High slippage in the pump will cause the pump to run considerably hotter than the oil reservoir temperature. In normal operation, with a good pump, the pump case will run about 20°F above the reservoir temperature. If greater than this, excess slippage, caused by wear, may be the cause.

Check also for slipping belts, sheared shaft pin or key, broken shaft, broken coupling, or loosened set screw.

STEP 5 - Relief Valve ...

If the test in STEP 3 has indicated the trouble to be in the relief valve, the quickest remedy is to replace the valve with one known to be good. The faulty valve may later be disassembled for inspection and cleaning. Pilot-operated relief valves have small orifices which may be blocked with accumulations or dirt. Blow out all passages with an air hose and run a small wire through orifices. Check also for free movement of the spool. In a relief valve with pipe thread connections in the body, the spool may bind if pipe fittings are over-tightened. If possible, test the spool for bind before unscrewing threaded connections from the body, or screw in fittings tightly during inspection of the valve.

STEP 6 - Cylinder ...

If the pump will deliver full pressure when operating across the relief valve in STEP 2, both pump and relief valve can be considered good, and the trouble is further downstream. The cylinder should be tested first for worn-out or defective packings by the method described below.

Cylinder Testing - Run the piston to one end of its stroke and leave it stalled in the position under pressure. Crack the fitting on the same end of the cylinder to check for fluid leakage. After checking, tighten the fitting and run the piston to the opposite end of the barrel and repeat the test. Occasionally a cylinder will leak at one point in its stroke due to a scratch or dent in the barrel. Check suspected position and run the piston rod against it for testing. Once in a great while a piston seal may leak intermittently. This is usually caused by a soft packing or O-ring moving slightly or rolling into different positions on the piston, and is more likely to happen on cylinders of large bore. When making this test on hydraulic cylinders, the line should be completely removed from a cylinder port during the test. The open line from the valve should be plugged or capped since a slight back pressure in the tank return line would spill oil from the line if not plugged. Pistons with metal ring seals can be expected to have a small amount of leakage across the rings and even "leak-tight" soft seals may have a small bypass during new seal break-in or after the seals are well worn.

STEP 7 - Directional Control Valve ...

If the cylinder has been tested (STEP 6) and found to have a reasonably tight piston seals, the 4-way valve should be checked next. Although it does not often happen, an excessively worn valve spool can slip enough oil to prevent build-up of maximum pressure. Symptoms of this condition are a loss of cylinder speed together with difficulty in building up to full pressure even with the relief valve adjusted to a high setting. This condition would be more likely to occur with high pressure pumps of low volume output, and would develop gradually over a long period of time. Four-way valves may be tested by the method described below.

4-Way Valve Testing - For testing 4-way valves, either air or hydraulic, it is necessary to obtain access to the exhaust or tank return ports so that the amount of leakage can be observed. To make the test, disconnect both cylinder lines and plug these ports on the valve. Start up the system and shift the valve to one working position. Any flow out the exhausts or tank return line while the valve is under pressure is the amount of leakage. Repeat the test in all other working positions of the valve.

Other Components ...

Check other components such as bypass flow controls, hydraulic motors, etc. Solenoid 4-way valves of the pilot-operated type with tandem or open center spools may not have sufficient pilot pressure to shift the spool.

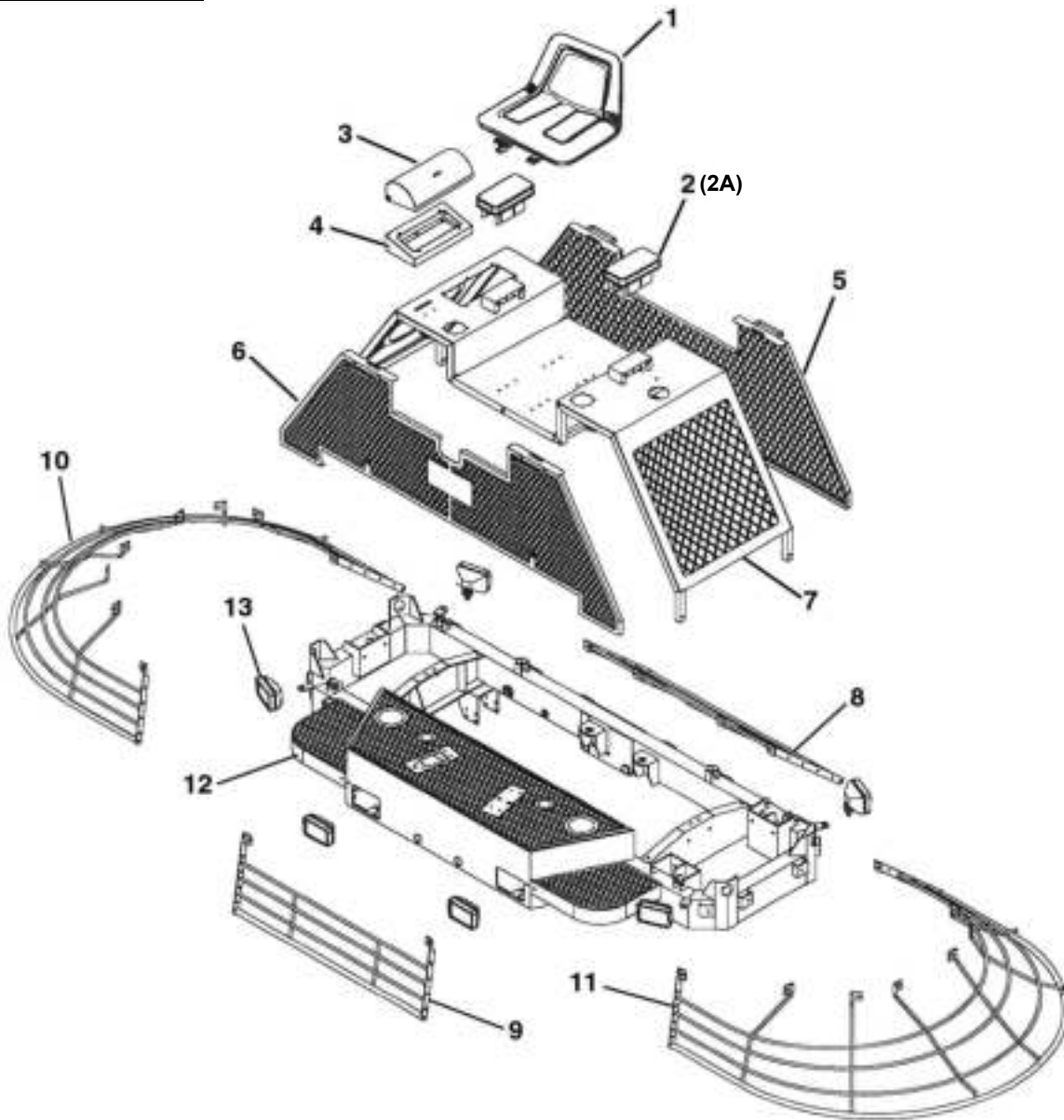
Frame Assembly .....	.2A-2
Engine Mounting System .....	.2A-3
Left Hand Crosshead & Spider Assembly .....	.2A-4-5
Right Hand Crosshead & Spider Assembly .....	.2A-6-7
Pitch and Steering Hydraulic Schematic .....	.2A-8
Hydraforce Manifold Hydraulic Schematic .....	.2A-9
Closed Loop System Hydraulic Schematic .....	.2A-10
Electrical Diagram f/ HD 550 .....	.2A-11
Control Panel Assembly .....	.2A-12
Accessories .....	.2A-13&14

NOTE: All set screws used on MODEL HD 550-1500-HYD have blue (LOC-TITE™) applied at the factory. If set screw is removed or loosened for any reason re-apply blue (LOC-TITE™).

NOTE: All grease fittings on MODEL HD 550-1500-HYD are capped with CAP PLUG GC-5 part number #015692 to protect the fitting. If cap becomes missing or damaged replace it as soon as possible.

2A PARTS

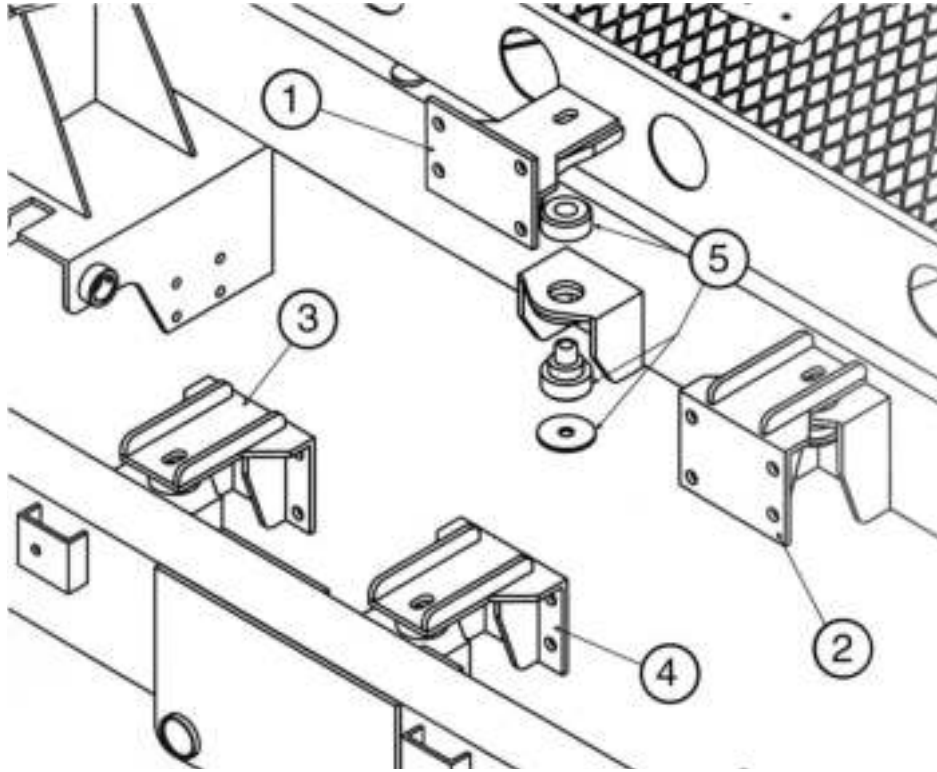
FRAME ASSEMBLY



ILL.	PART #	DESCRIPTION	QTY.
1.	.037769	SEAT	1
2.	.039991	ARM REST PAD	2
2a	.040254S	ARM REST BRACKET SHORT	2
3.	.042992	CONTROL PANEL COVER	1
4.	.043000	CONTROL PANEL SHIELD	1
5.	.043121	REAR SCREEN	1
6.	.043118	FRONT SCREEN	1
7.	.043047	HD 550 SEAT FRAME	1
8.	.042875	REAR RING F/ HD 550	1
9.	.042874	FRONT RING F/ HD 550	1
10.	.042873	RIGHT HAND END RING	1
11.	.042871	LEFT HAND END RING	1
12.	.043090	HD 550 MAIN FRAME	1
13.	.036881	12V 50W FLOOD LIGHT	6

ENGINE MOUNTING SYSTEM

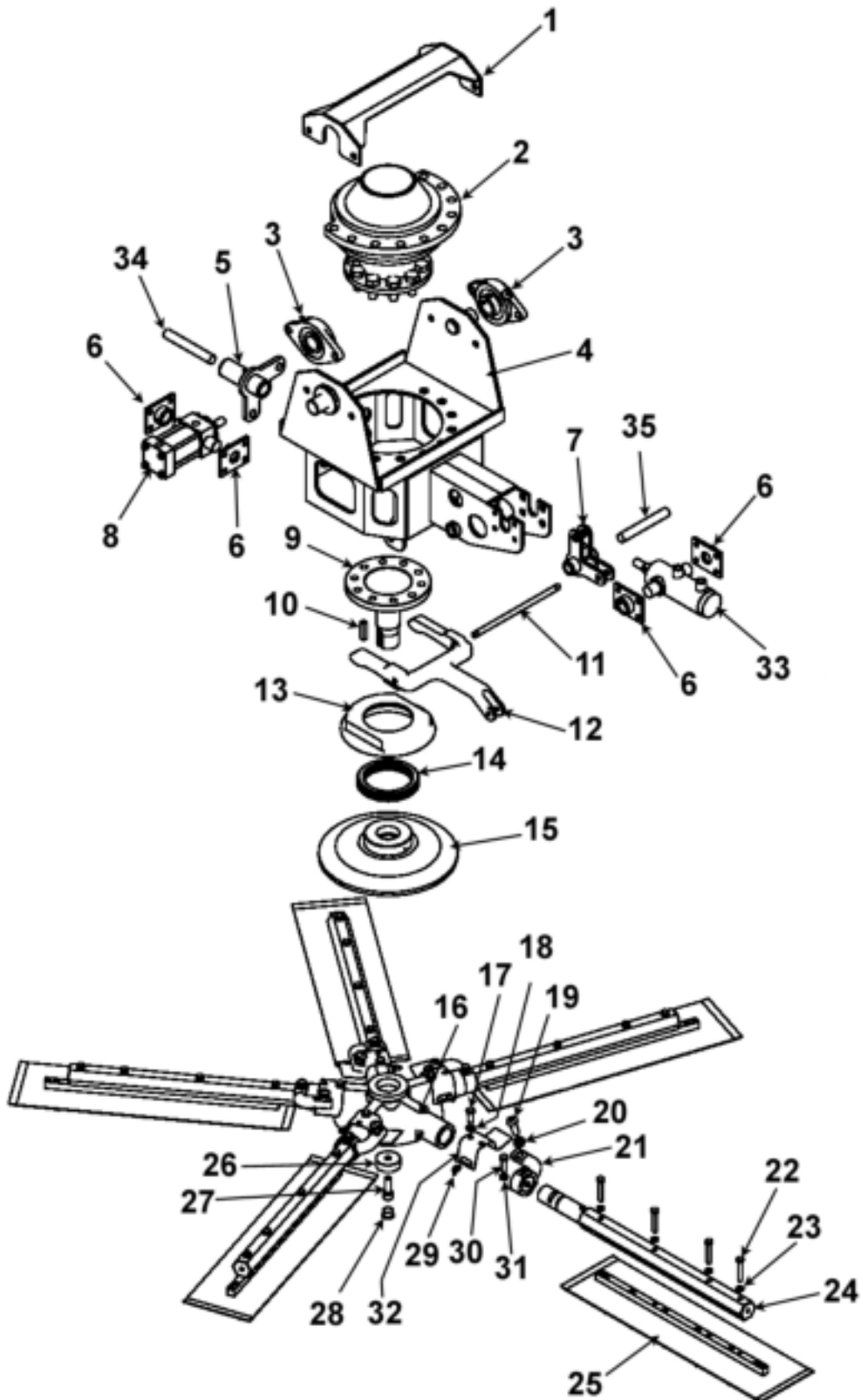
2A PARTS



ILL.	PART #	DESCRIPTION	QTY.
1.....	042985	FRONT LEFT HAND ENGINE MOUNT BRKT.	1
2.....	042978	FRONT RIGHT HAND ENGINE MOUNT BRKT.	1
3.....	042989	REAR LEFT HAND ENGINE MOUNT BRKT.	1
4.....	042987	REAR RIGHT HAND ENGINE MOUNT BRKT.	1
5.....	043364	NEOPRENE MOTOR MOUNT ISOLATOR W/ WASHER	4

2A PARTS

LEFT HAND CROSSHEAD & SPIDER ASSEMBLY



LEFT HAND CROSSHEAD & SPIDER ASSEMBLY Cont'd

2A PARTS

ILL.	PART #	DESCRIPTION	QTY.
1.	043017	BRKT., 2-WAY STIFFENER	1
2.	043062	MOTOR, BOSCH REXROTH MOBILE HD550	1
	044285	WHEEL STUD, 14M X 1.5 HYD RTR MTR	10
	044286	WHEEL NUT, 14M X 1.5 GR 10.9 RTR MTR (103 Ft./lbs)	10
3.	033768	BEARING, FLANGE 1 1/4" W/LOCK COLLAR	2
4.	042974	WELD'T LH HYD MOTOR MNT BRKT.	1
5.	046432	ASSY, LH FWD/RVS STRG FULCRUM	1
	027969	FSTN, HHCS 5/8-18 X 2 GR 8	2
	043269	FSTN, NUT STOVER 5/8-18	2
6.	042949	WELD'T, PLATE CYLINDER MOUNT	4
7.	042951	WELD'T, FULCRUM BRKT 2 7/8	1
8.	043452	HYDRAULIC STEERING CYLINDER 2 X 1.5	1
9.	046645	SHAFT, TYPE 3 RH ROTOR	1
10.	046231	KEY, ROTOR SHAFT	1
11.	039450	PIN, YOKE	1
	044226	RING, 1" EXTERNAL SNAP	2
12.	043990	YOKE ARM FOR HD 550	1
13.	039430	CAP, PRESSURE PLATE	1
14.	039912	THRUST BEARING, XW3-7/8"	1
15.	046230	PLATE, PRESSURE	1
16.	046228	SPIDER, MACHINED LH 5-BOSS	1
17.	015683	SCREW 3/8-16 X 7/8 DOG CAP	5
18.	015682	LOCK WASHER EXTERNAL STAR 3/8	5
19.	028216	BOLT, CARRIAGE 1/2-13 X 1-1/4	5
20.	010050	FSTN, NUT HEX JAM 1/2-13	5
21.	039880	LEVER, LIFT UNIVERSAL XHD	5
22.	010024	BOLT, 5/16-18 X 2 GR. 5	20
23.	010090	LOCK WASHER 5/16	20
24.	039525	ARM, TROWEL F/ HD 550	5
25.	047973	TROWEL BLADE,FLT FIN 8x23 Gold 1"bar	5
26.	046643	WASHER, TYPE 3 RETAINING 550/560	1
27.	046647	BOLT, 5/8-18 UNF RH X 1-1/2 SCH CAP (180 Ft./lbs)	1
28.	046646	PLUG, 7/8 THREAD PROTECT CAP	1
29.	024755	GREASE FITTING 1/8-27 NPT 45 DEGREE	5
30.	040821	SET SCREW SQ. HEAD 3/8-16 X 1 1/4	5
31.	015684	NUT, JAM 3/8-16	5
32.	039874	CLIP, UNIVERSAL SPRING	5
33.	043053	PITCH CYLINDER 2 X 2.5	1
	020688	FSTN, NUT HEX JAM 5/8-18 RH	1
	043125	ROD, END FEMALE 5/8 (W/SPL.FIT)	1
34.	043450	PIN, FULCRUM STEERING HD550	1
35.	042970	SHAFT, F/ FULCRUM ON PITCH CONTROL	1
	019900	ROD, END FEMALE 1/2"	1
	221408	ROD, END MALE 1/2"	1

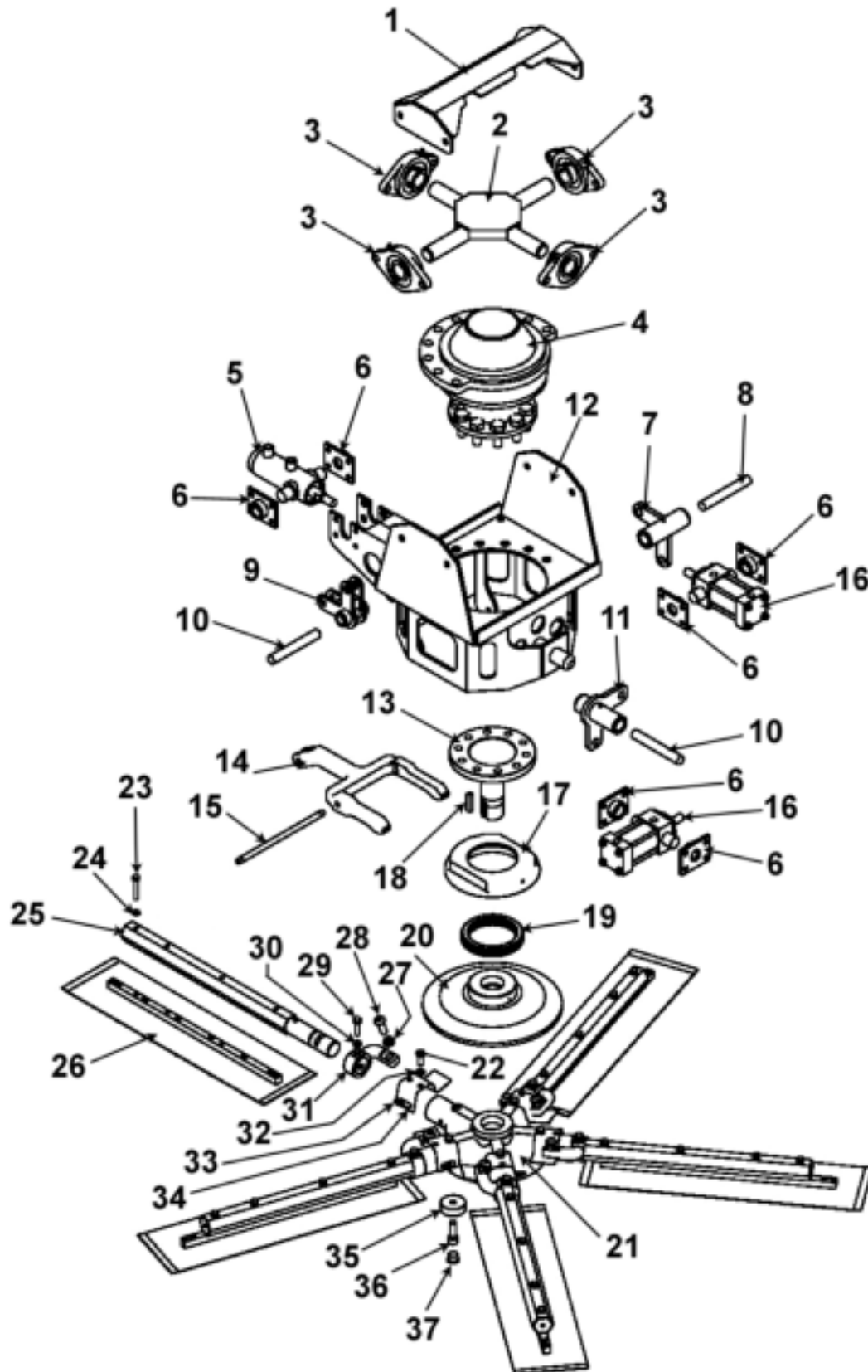
NOTICE: Please note the RH rotor shaft part numbers below:

Machine Serial Numbers prior to 5500704003 use "Type 1" **043027**

Machine Serial Numbers from 5500704003 to 5500105004 use "Type 2" **046425**

2A PARTS

RIGHT HAND CROSSHEAD & SPIDER ASSEMBLY



RIGHT HAND CROSSHEAD & SPIDER ASSEMBLY Cont'd

**2A
PARTS**

ILL.	PART #	DESCRIPTION	QTY.
1.	043023	BRKT., 4-WAY STIFFENER	1
2.	042958	WELD'T, 4-WAY CROSSHEAD HD550	1
3.	033768	BEARING, FLANGE 1 1/4" W/LOCK COLLAR	4
4.	043062	MOTOR, BOSCH REXROTH MOBILE HD550	1
	044285	WHEEL STUD, 14M X 1.5 HYD RTR MTR	10
	044286	WHEEL NUT, 14M X 1.5 GR 10.9 RTR MTR (103 Ft./lbs)	10
5.	043053	PITCH CYLINDER 2 X 2.5	1
	020688	FSTN, NUT HEX JAM 5/8-18 RH	1
	043125	ROD, END FEMALE 5/8 (W/SPL.FIT)	1
6.	042949	WELD'T, PLATE CYLINDER MOUNT	6
7.	043086	ASSY, FULCRUM LEFT TO RIGHT STEERING	1
	027969	FSTN, HHCS 5/8-18 X 2 GR 8	2
	043269	FSTN, NUT STOVER 5/8-18	2
8.	043450	PIN, FULCRUM STEERING HD 550	2
9.	042951	WELD'T, FULCRUM BRKT 2 7/8	1
10.	042970	SHAFT, F/ FULCRUM ON PITCH CONTROL	1
11.	046434	ASSY, RH FWD/RVS STRG FULCRUM	1
12.	042973	WELD'T RH HYD MOTOR MNT BRKT.	1
13.	046644	SHAFT, TYPE 3 LH ROTOR	1
14.	043990	ARM, YOKE	1
15.	039450	PIN, YOKE	1
	044226	E-CLIP	2
16.	043452	HYDRAULIC STEERING CYLINDER 2 X 1.5	2
17.	039430	CAP, PRESSURE PLATE	1
18.	046231	KEY, ROTOR SHAFT	1
19.	039912	THRUST BEARING, XW3-7/8"	1
20.	046230	PLATE, PRESSURE	1
21.	046229	SPIDER, MACHINED RH 5-BOSS	1
22.	015683	SCREW 3/8-16 X 7/8 DOG CAP	5
23.	010024	BOLT, 5/16-18 X 2 GR. 5	20
24.	010090	LOCK WASHER 5/16	20
25.	039525	ARM, TROWEL F/ HD 550	5
26.	047973	TROWEL BLADE,FLT FIN 8x23 Gold 1"bar	5
27.	010050	FSTN, NUT HEX JAM 1/2-13	5
28.	028216	BOLT, CARRIAGE 1/2-13 X 1-1/4	5
29.	040821	SET SCREW SQ. HEAD 3/8-16 X 1-1/4	5
30.	015684	NUT, JAM 3/8-16	5
31.	039880	LEVER, LIFT UNIVERSAL XHD	5
32.	015682	LOCK WASHER EXTERNAL STAR 3/8	5
33.	024755	GREASE FITTING 1/8-27 NPT 45 DEGREE	5
34.	039874	CLIP, UNIVERSAL SPRING	5
35.	046643	WASHER, TYPE 3 RETAINING 550/560	1
36.	046648	BOLT, 5/8-18 UNF LH X 1-1/2 SCH CAP (180 Ft./lbs)	1
37.	046646	PLUG, 7/8 THREAD PROTECT CAP	1

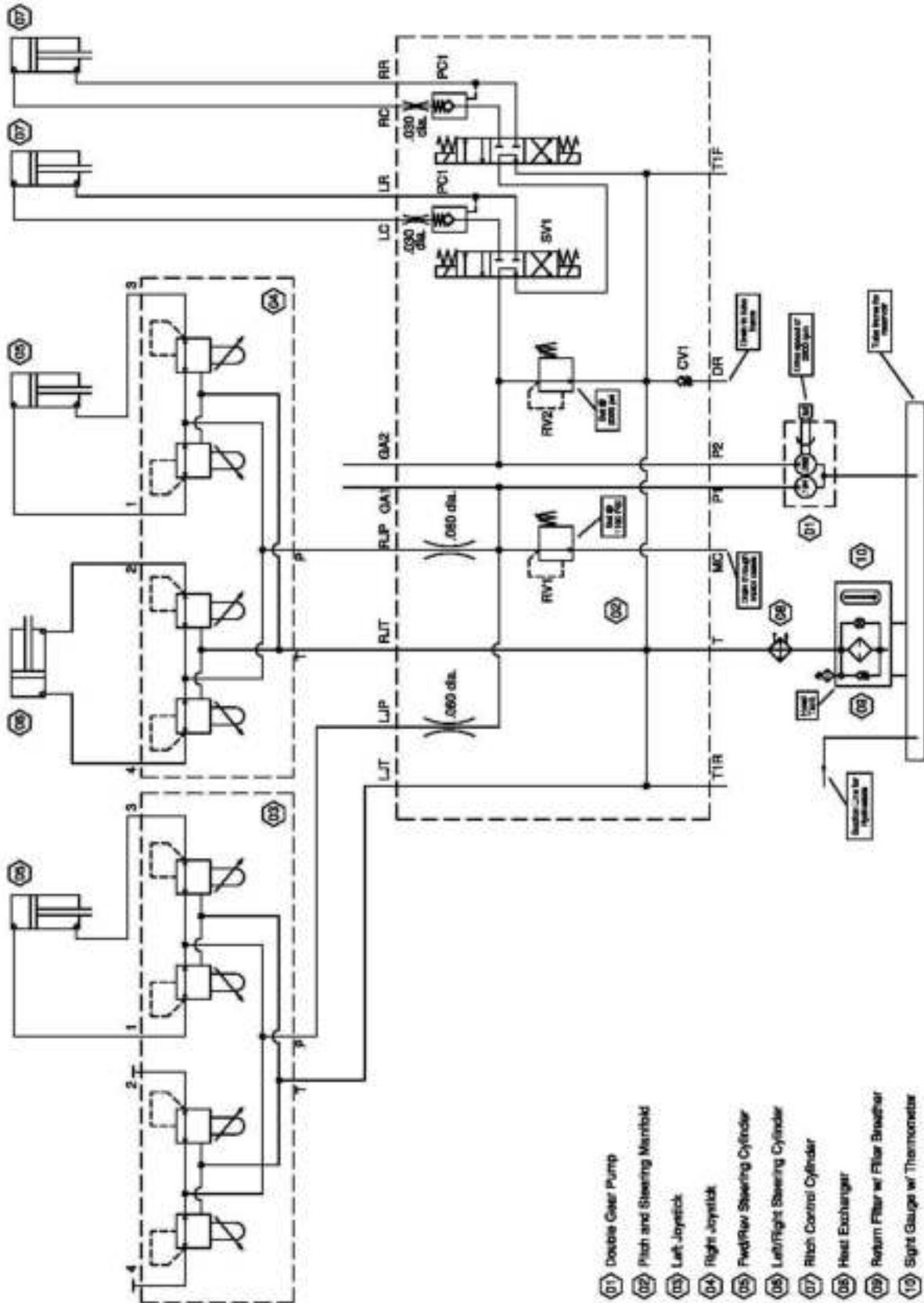
NOTICE: Please note the LH rotor shaft part numbers below:

Machine Serial Numbers prior to 5500704003 use "Type 1" **043028**

Machine Serial Numbers from 5500704003 to 5500105004 use "Type 2" **046426**

2A PARTS

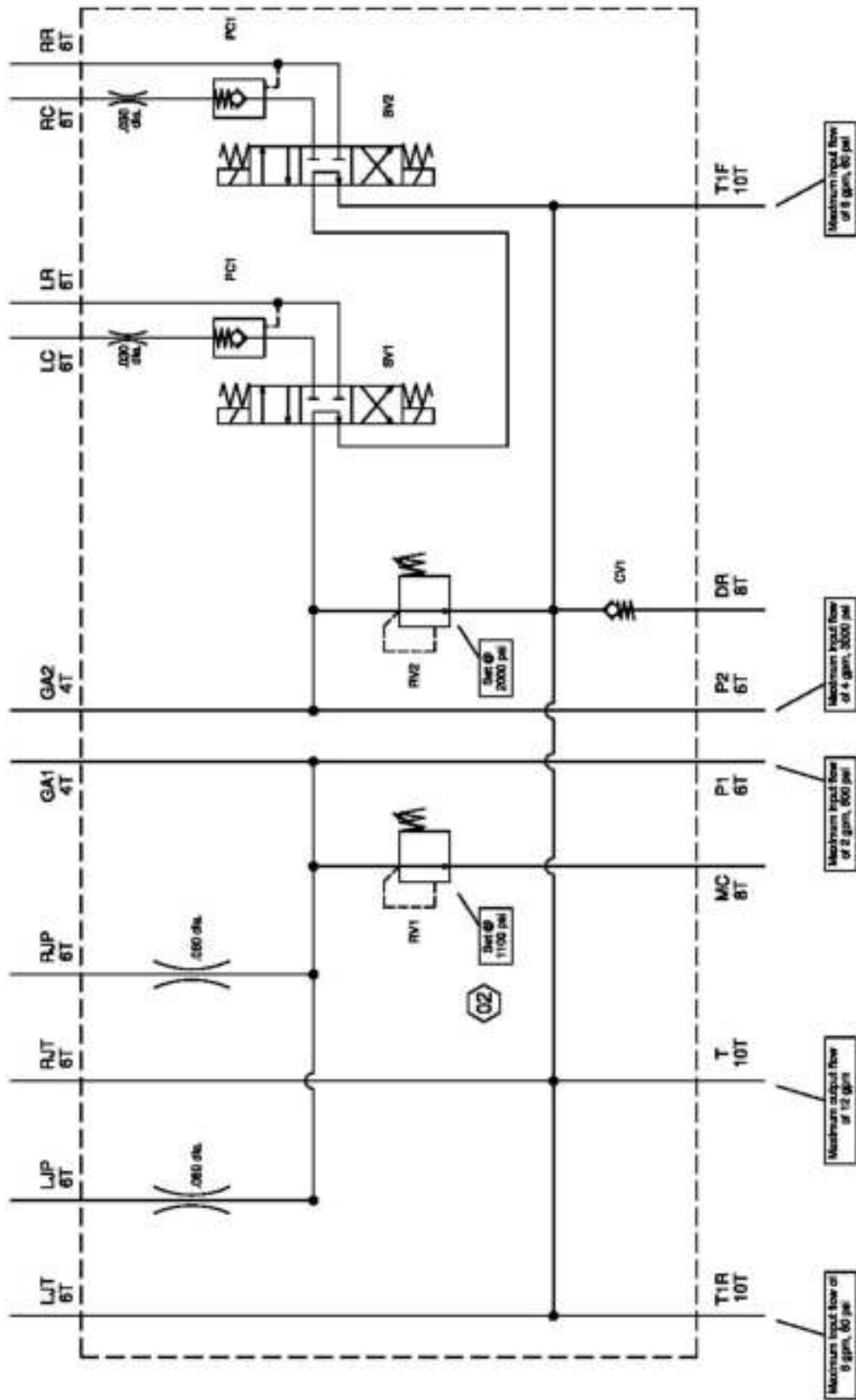
PITCH AND STEERING HYDRAULIC SCHEMATIC



- 01 Double Gear Pump
- 02 Pitch and Steering Manifold
- 03 Left Joystick
- 04 Right Joystick
- 05 Fed/Rev Steering Cylinder
- 06 Left/Right Steering Cylinder
- 07 Pitch Control Cylinder
- 08 Heat Exchanger
- 09 Return Filter w/ Filter Breather
- 10 Sight Gauge w/ Thermometer

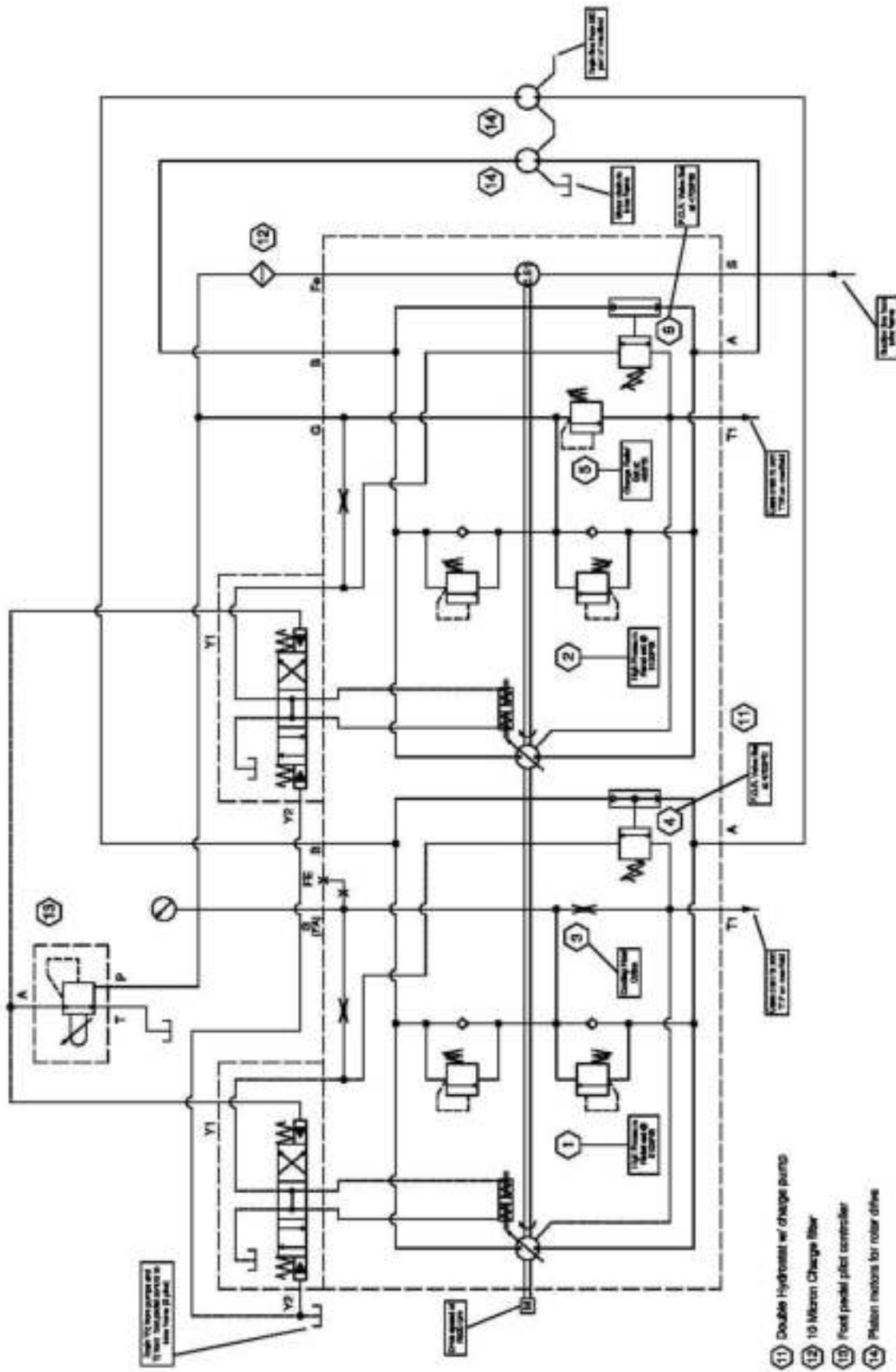
HYDRAFORCE MANIFOLD HYDRAULIC SCHEMATIC

2A PARTS



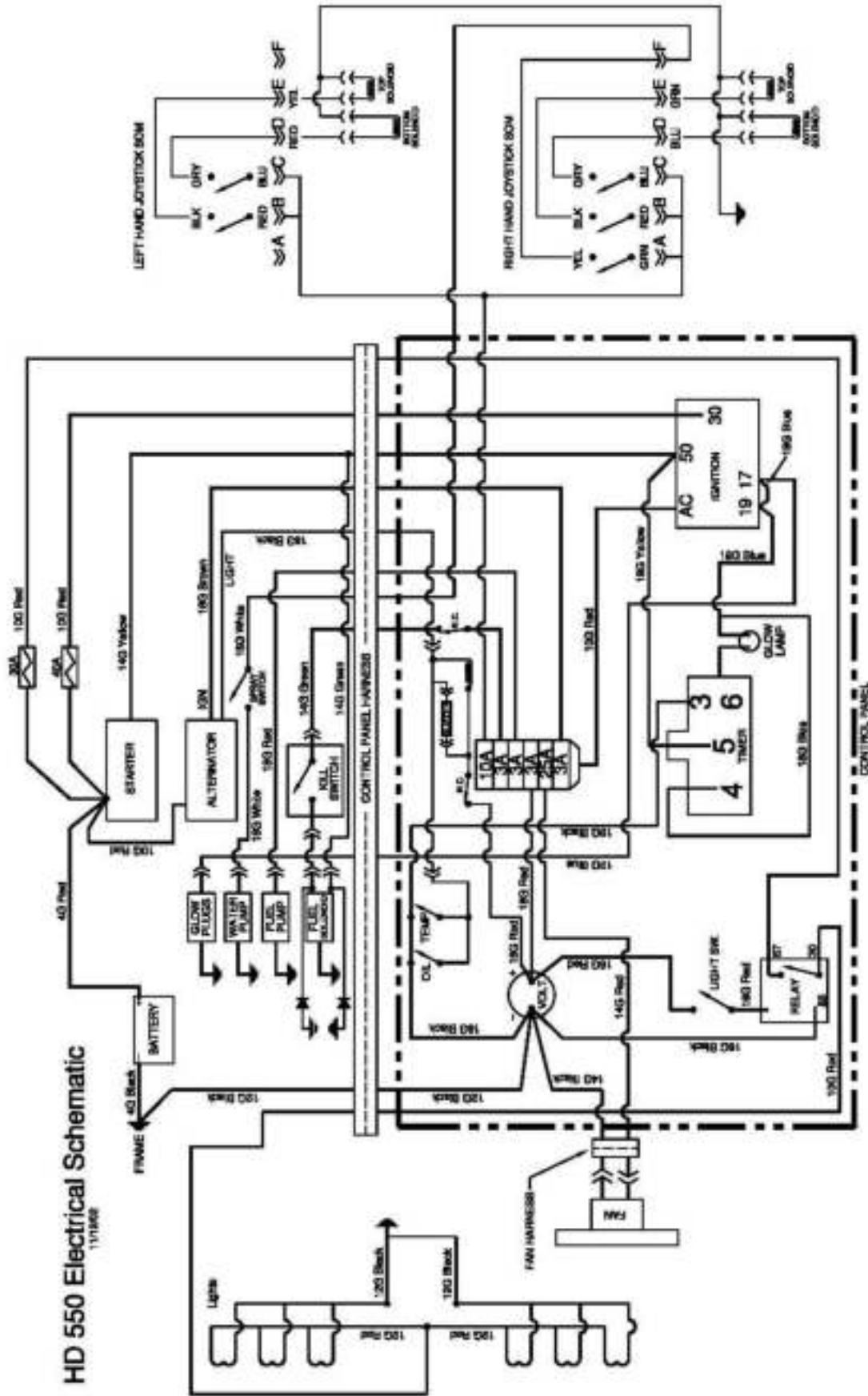
2A PARTS

CLOSED LOOP SYSTEM HYDRAULIC SCHEMATIC



ELECTRICAL DIAGRAM F/ HD 550

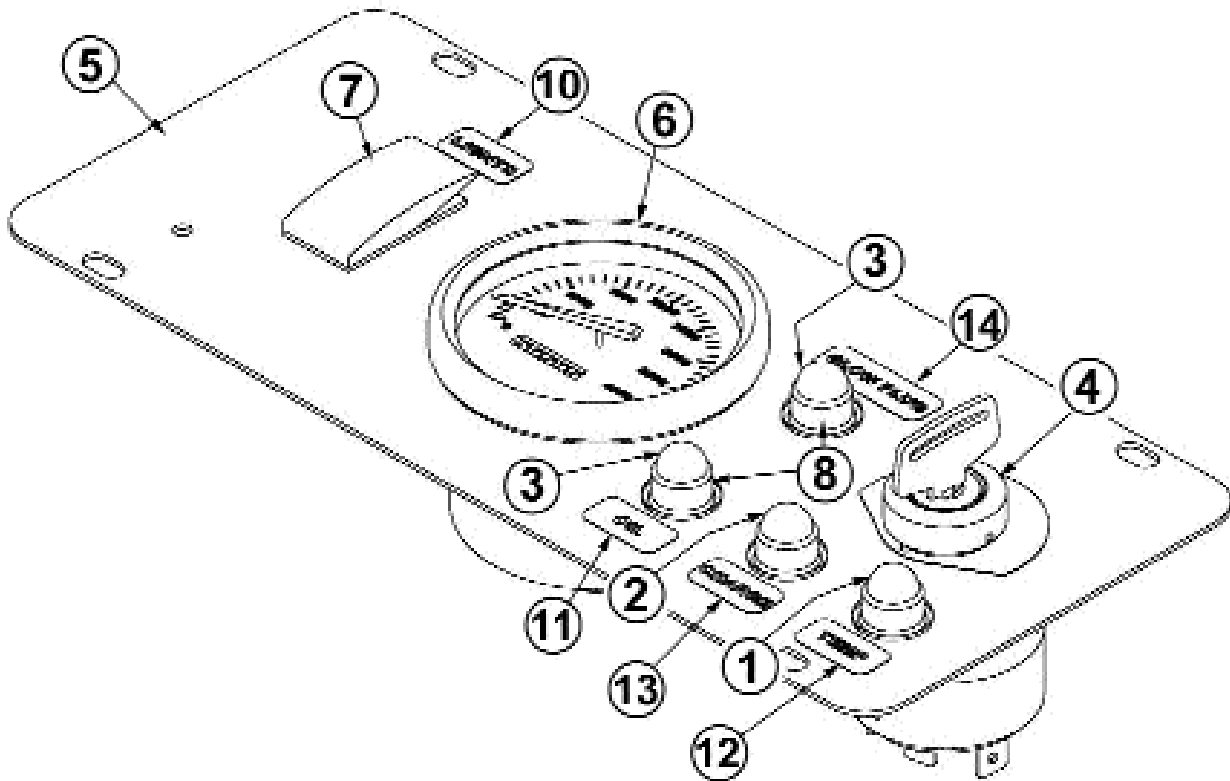
2A PARTS



HD 550 Electrical Schematic
11/1982

2A PARTS

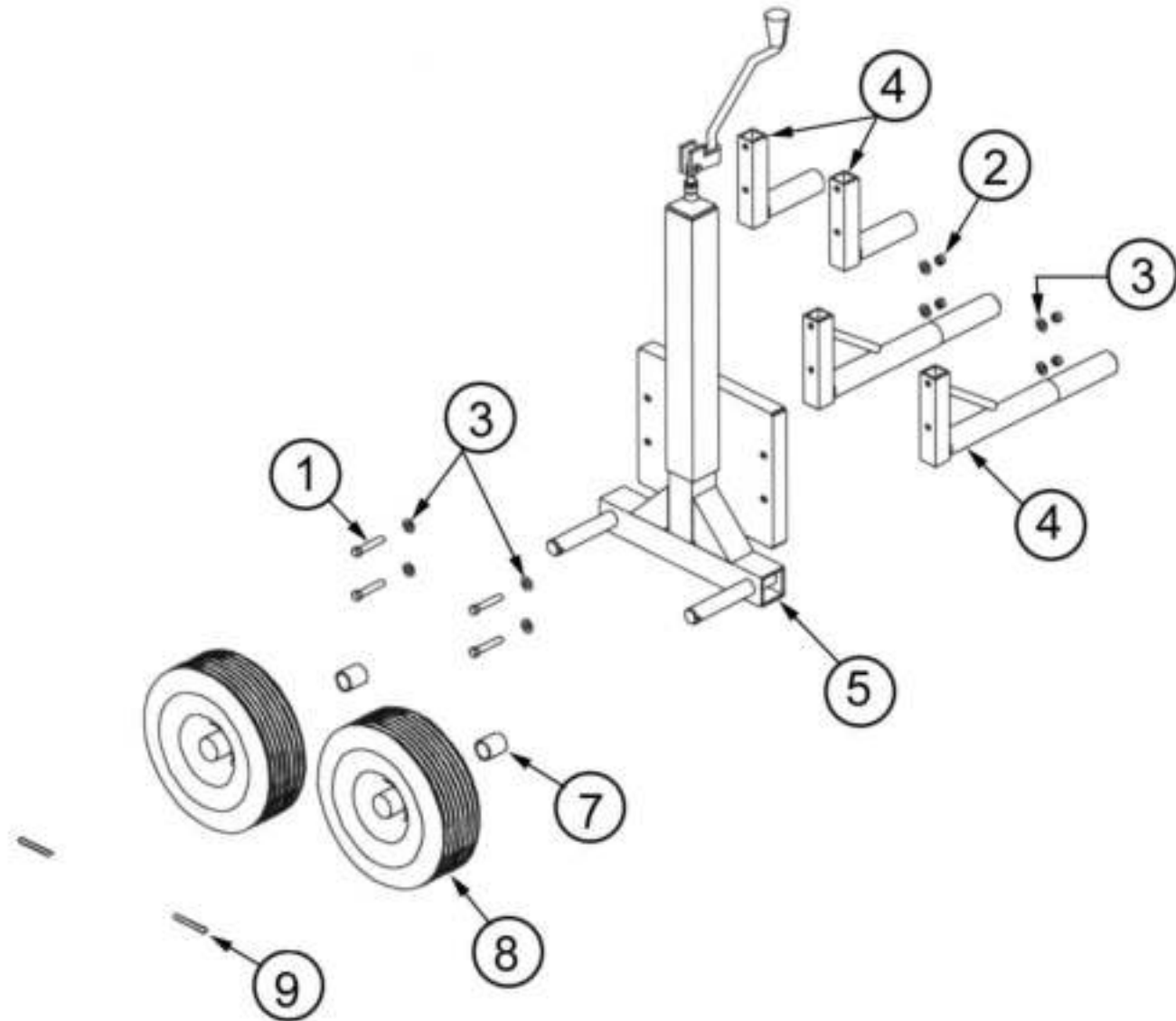
CONTROL PANEL ASSEMBLY



ILL.	PART#	DESCRIPTION	QTY.
1.	034613	LENS, GREEN	1
2.	034612	LENS, AMBER	1
3.	034614	LENS, RED	2
4.	037785	KEY SWITCH	1
5.	040231	SP500A-XHD CONTROL PANEL	1
6.	037788	TACHOMETER	1
7.	032125	SWITCH, ROCKER	1
8.	034610	FIXTURE, LIGHT	4
9.	034611	LIGHT-INSIDE LIGHT FIXTURE- (NOT SHOWN)	4
10.	034876	DECAL, "LIGHTS"	1
11.	036772	DECAL, "OIL"	1
12.	036771	DECAL, "TEMP"	1
13.	036770	DECAL, "CHARGE"	1
14.	037768	DECAL, "GLOW PLUG"	1
15.	040487	CONTROL PANEL GASKET	1

ACCESSORIES (cont'd)
SUPER PRO DOLLY JACK SYSTEM
SET PART # 039578

2A
PARTS



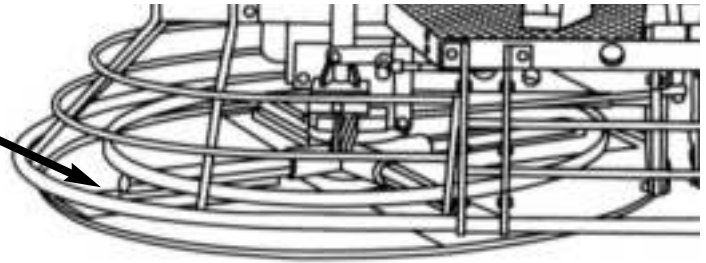
ILL.	PART#	DESCRIPTION	QTY.
1.	.010041	BOLT, 3/8-16 x 2-1/4	8
2.	.010464	NUT, NYLON LOCK 3/8-16	8
3.	.017751	FLAT WASHER 3/8	8
4.	.040661	DOLLY JACK MOUNTING TUBES (FRONT)	2
	.040352	DOLLY JACK MOUNTING TUBES (REAR)	2
5.	.039091	DOLLY JACK	2
6.	.039578	COMPLETE DOLLY JACK SET	1
7.	.039094	WHEEL SPACER	4
8.	.039095	TIRES	4
9.	.010133	PIN, COTTER 3/16 x 2	8

**2A
PARTS**

ACCESSORIES (cont'd)

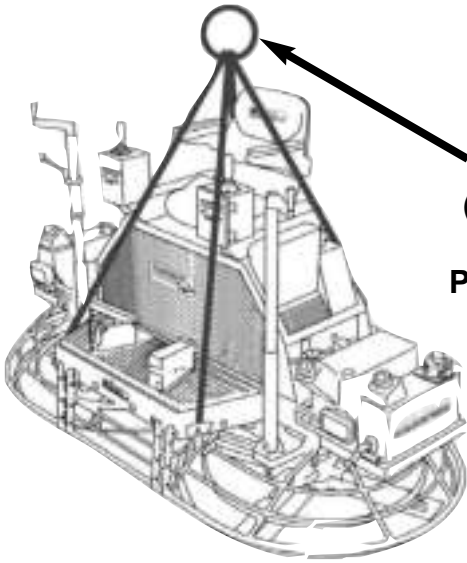
**FLOATING
DISCS (PANS)**

PART #: 039403-2

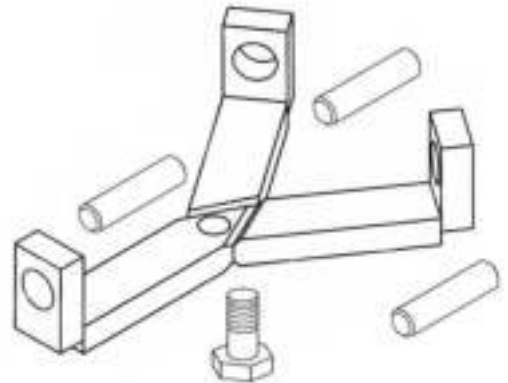


**LIFTING
BRIDLE
(SLING TYPE)**

PART #: 040041



**SPIDER PULLER
KIT
PART #040906**



**SUPER PRO RIDING
TROWEL VINYL
COVER
PART #038035**



**TROWEL ARM
ALIGNMENT
JIG
PART #016863**

