

Riding Trowel

OPERATIONS
PARTS

OPERATIONS
PARTS

PRINTED 9/00

THIS MANUAL COVERS RIDING TROWEL(S) BELOW

MODEL

1200 OL SD 24LM	# 032076
1200 OL SD 31VG	# 038809
1200 NOL SD 24LM	# 032034
1200 NOL SD 31VG	# 038722

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; 410,931. **U.S. Utility Patents:** 5,108,220; 5,238,323; 5,480,257; 5,480,258; 5,613,801; 5,685,667; 5,803,658; 5,816,739; 5,890,833; 5,934,823; 5,967,696; 5,988,938; 6,048,130; 6,053,660; 6,089,786. **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 Parts	6 Months
B. All New Gear Boxes	2 Years
C. All Factory Reconditioned Gear Boxes	1 Year

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

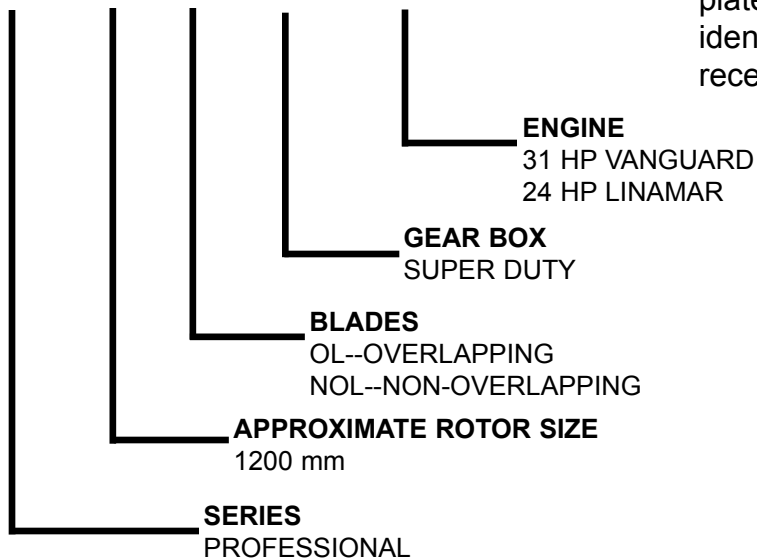
1A OPERATIONS

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

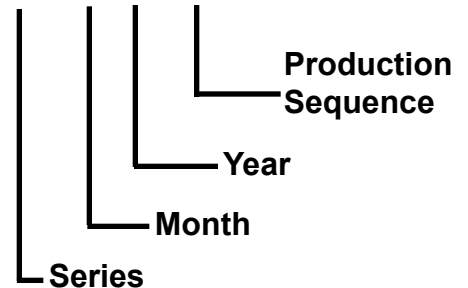
PRO 1200-NOL-SD 31VG



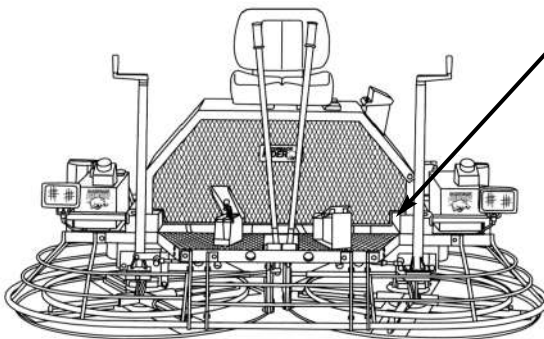
Serial Number

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

120 0899 001



Identification Plate Location



FILL IN FOR FUTURE REFERENCES

Model Number: _____

Serial Number: _____

Date Purchased: _____

Purchased From: _____

1.1	Safety Note	1A-6
1.2	Laws Pertaining to Spark Arrestors	1A-6
1.3	Operating Safety	1A-7
1.4	Service Safety	1A-8
1.5	Dimensions	1A-8
1.6	Technical Data	1A-9
1.7	Description	1A-10
1.8	Before Starting	1A-10
1.9	Starting	1A-10
1.10	Operating	1A-11
1.11	Stopping	1A-11
1.12	Steering	1A-12
1.13	Pitch Adjustment	1A-12
1.14	Periodic Maintenance Schedule	1A-13
1.15	Trowel Gearbox	1A-13
1.16	Drive Belts	1A-14
1.17	Control Linkage Lubrication	1A-14
1.18	Control Linkage Adjustment (Forward and Reverse)	1A-15
1.19	Right Hand Control Lever Adjustment (Right or Left)	1A-15
1.20	Lift Lever Adjustment	1A-16
1.21	Transporting Trowels	1A-17
1.22	Battery Jump Start Procedures	1A-18

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 NUMBER:	_____
ADDRESS:	_____		
CITY:	_____	STATE:	_____
ZIP:	_____		
SALESMAN:	_____		
ADDITIONAL INFORMATION:	_____		

Information Contained in This Manual

This manual provides information and procedures to safely operate and maintain the Allen Engineering PRO 1200 SD Model **Razorback® Riding Trowels**.

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 Returned Goods Authorization (RGA) 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 lose 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 039949.

© 2000 Allen Engineering Corp.
All Rights Reserved -- Contents
Subject to Change Without Prior
Notice.

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 Laws Pertaining to Spark Arrestors

Notice: Some states require that in certain locations arrestors be used on internal combustion engines. A spark arrester is a device designed to prevent the discharge of spark or flames from the engine exhaust. It is often required when operating equipment on forested land to prevent the risk of fires. Consult the engine distributor or local authorities and make sure that you comply with regulations regarding spark arrestors.

1A OPERATIONS

1.3 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.

1.4 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 crank a flooded engine with the spark plug removed. Fuel trapped in the cylinder will squirt out the spark plug opening.

DO NOT test for spark if engine is flooded or the smell of gasoline is present. A stray spark could ignite the fumes.

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.

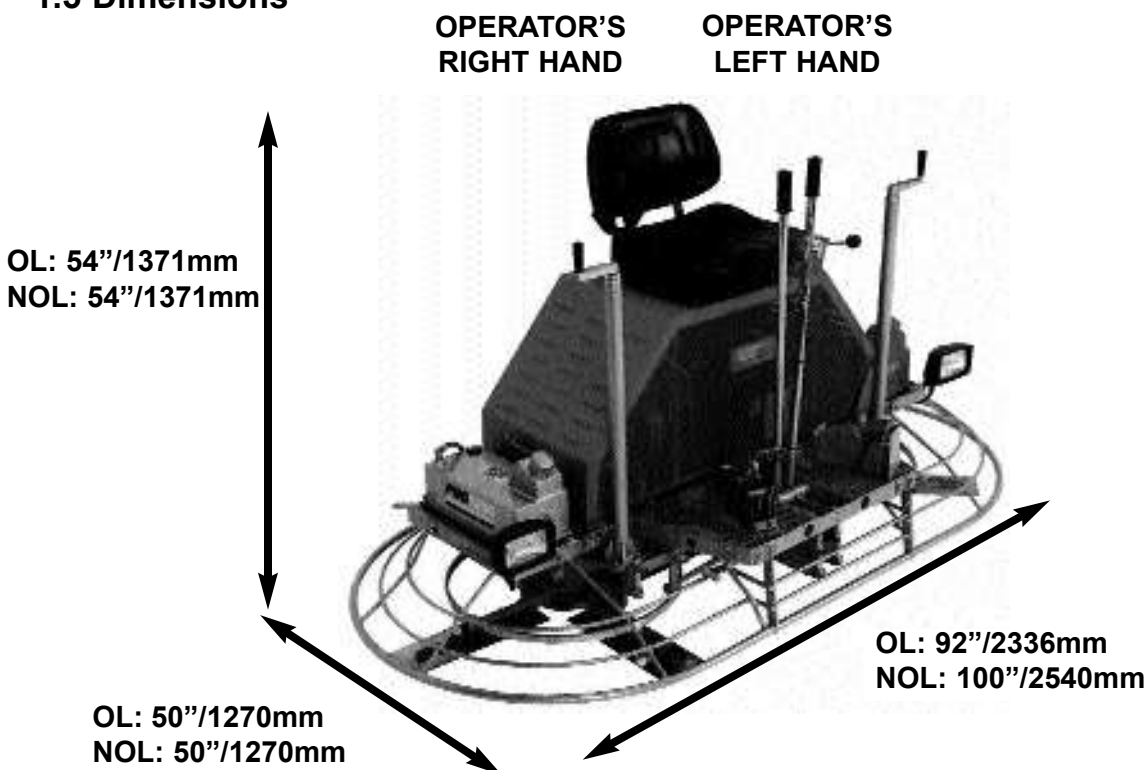
ALWAYS operate machine with all safety devices and guards in place and in working order.

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 disconnect battery on machines before servicing to avoid accidental start-up.

1.5 Dimensions



1A OPERATIONS

1.6 Technical Data

Standard Features:

Dimensions (L x W x H)	.OL-92" X 50" X 54" (224 x 127 x 137 cm)
(guardrings/top of seat)	.NOL-100" X 50" X 54" (254 x 127 x 137 cm)
Panning Path Width	.95" (241cm)
Two Rotors (diameter)	.46" (1,168 mm)
Rotor Speed (RPM)	.110 to 145
Eight Finish Blades	.6" x 18 "
Gearboxes (2)	.Super Duty (SD)
Detachable Guard Rings?	.Yes
Flip-Up Hooded Seat Frame	.Liquid-cooled engines only
Operator Control Panel	.Standard Except on Linamars
Powered Retardant Spray System?/Capacity	.Yes/4 gal. (16 lit.) on Vanguard
.....	.5 gal. (19 lit.) on Linamars
Steering System	.Dual Levers
Gearbox Rotation	.Standard
Battery	.12 Volt
Safety Shutdown Switch	.Foot Pedal
Fuel Capacity	.4 gal. (16 lit.)
Approximate Running Time	.2.5 Hours
Centrifugal Clutch (diameter)	.8" (203 mm)
Twin Belt Drive?	.Yes
Drive Line System	.Rotating Shaft w/ Universal Joint
Engine Hour and RPM Meter	.Digital

Engine Options:

24 HP Linamar (LM)

Weight	.OL-971 lbs. (440 kgs.)/ NOL-1,005 lbs. (456 kgs.)
Lights/Amps	.4/35
Temp/Low Oil Alert	.N/A/Shut Down

31 HP Vanguard (VG)

Weight	.OL-1,152 lbs. (523 kgs.)/ NOL-1,155 lbs. (524 kgs.)
Lights/Amps	.4/40
Temp/Low Oil Alert	.Light/Light

Summary Data of Sound & Vibration Testing for CE Marking

Test Machine	Engine Type	Avg. Sound Pressure Level (SPL)	Operator Ear SPL	Calculated Sound Power Level	Seat Vibration Overall	Foot Vibration Overall	Hand Vibration Maximum
		dB(A)	dB(A)	dB(A)	m/sec ²	m/sec ²	m/sec ²
1200-NOL-SD	Onan 24	101	97	117	1.2	0.5	1.6

This information was acquired from extensive sound and vibration analysis tests ran at Allen Engineering Corporation. The data above was acquired in May and June of 1996.

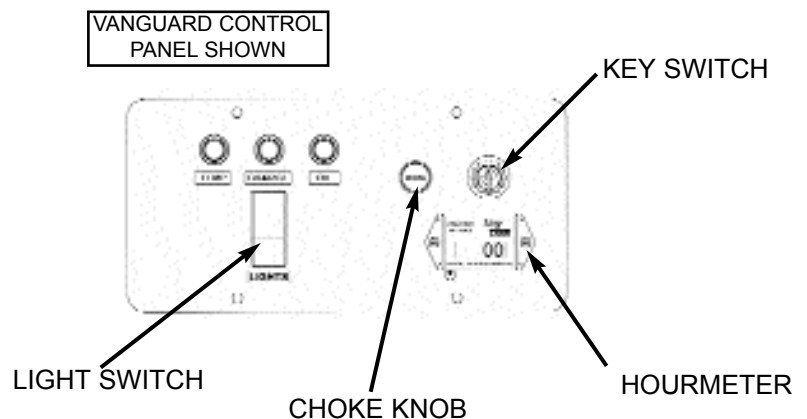
1.7 Description

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 eight finishing blades. The Super Duty Gearboxes are designed to provide exceptional performance with low maintenance and trouble free use under some of the most worse conditions. All Allen Engineering **Razorback® 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 2- 1/2 to 3 hours with a rotor speeds of 110 to 145 RPM for PRO 1200 SD series. The **Razorback® 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.

1.8 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



1.9 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. If engine is cold pull out the choke lever located on the control panel (refer to drawings above).
4. Press down on throttle pedal (located by the operator's right foot) one to two times. NOTE: To much throttle during start-up will flood the engine.
5. Turn key to the start-position. immediately release key when engine starts. If after two or three attempts the engine has not started push in choke. This will open the choke. Attempt to start trowel again. 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.

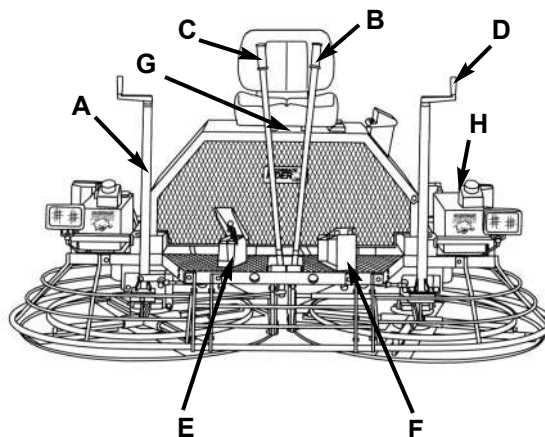
1A OPERATIONS

1.10 Operating

To utilize your Allen Engineering **Razorback® 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 (throttle control)
- F. left foot pedal (safety switch)
- G. seat adjustment
- H. fuel gauge



2. With the operator in the seat, show him the functions of the control levers (B) and (C) (refer to page 1A-12) 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 to warm up quicker and also engages the centrifugal clutch to max. RPM'S. NOTE: If you start out at a low RPM this will partially engage the clutch, causing it to slip. This will severely damage the clutch, causing clutch failure.

CAUTION: DO NOT use excessive pressure on the control levers. Excessive pressure does not increase the reaction time of the machine and can damage steering controls.

1.11 Stopping

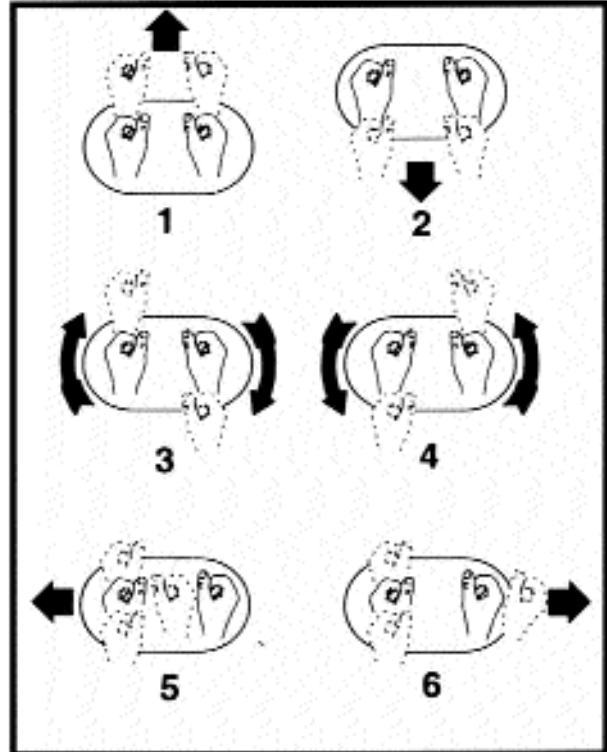
To stop the trowels movement, return the control levers (C) and (B) to their neutral position and release pressure on the right foot pedal (E) .

NOTE: On units equipped with an optional cruise control push lever all the way down this will release the right foot pedal and reduce engine speed to disengage the clutch. To stop engine turn the key to the off position.

1.12 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.

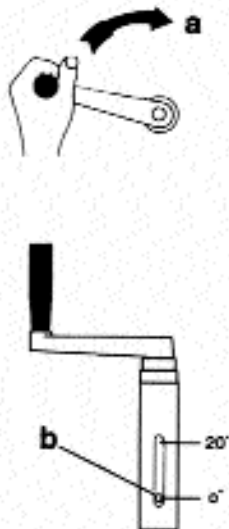
- 1 forward
- 2 reverse
- 3 rotate clockwise
- 4 rotate counter clockwise
- 5 left sideways
- 6 right sideways



1.13 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), slow the machine down, 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, turn the pitch control clockwise (a) use the pitch indicator (b) to adjust pitch equally on both right and left trowel blades.

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

1A OPERATIONS

1.14 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 pull the seat locking pin out and tilt seat back.

	DAILY	EVERY 20 HOURS	EVERY 50 HOURS	EVERY 100 HOURS	EVERY 300 HOURS
GREASE TROWEL ARMS	X				
CHECK OIL LEVEL IN G-BOX	X				
CHECK FUEL LEVEL	X				
INSPECT AIR FILTERS REPLACE AS NEEDED	X				
CHECK AND TIGHTEN EXTERNAL HARDWARE	X				
GREASE CONTROL LINKAGE		X			
CHECK DRIVE BELTS			X		
CHECK VALVE CLEARANCE			X		
CHANGE ENGINE OIL				X	
REPLACE OIL FILTERS				X	
OIL CROSSHEAD				X	
GREASE TROWEL G-BOX					X
REPLACE SPARK PLUG					X

1.15 Trowel Gearbox

1. Check Oil levels in the gearbox daily (every 8 hours) Add oil if oil level is below the check sight glass. To add oil tilt trowel back and remove the side plug. Add Oil through hole opening. Replace plug after proper level has been achieved. DO NOT Fill past the plug. Use only Mobil Oil SHC 634, synthetic ISO VG 460.

2. Each Gearbox has a grease fitting on top cover that must be greased (2 SHOTS ONLY) every 300 operating hours. Use only Mobilith SHC 220. Extended pressure grease.

To Tighten Belts

1. Loosen the jam nuts (E) located on the adjustment bolts (B).
2. Tighten the engine plate adjustment bolts (B) an equal number of turns until correct belt tension is obtained. Maximum belt play should be from 1/2 to 3/4" (13 to 19mm) at the center of the span. New belts should be re-tensioned after the first 10-12 hours of operation.
3. Tighten all lock nuts and jam nuts.

KAWASAKI ENGINE
REFERENCE ONLY

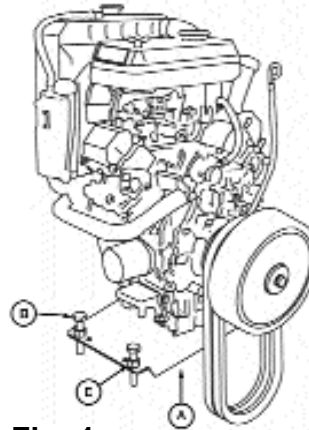


Fig. 1

To Replace

1. Loosen the four bolts(A) underneath the engine mounting plate. (refer to fig. 1)
2. Loosen Jam nuts(E) and Loosen engine plate adjustment bolts (B) until belt tension is relived. (refer to fig 1.)
3. Loosen set screws(C) where the u-joint couples to the drive shaft. (refer to fig. 2)
4. Slide u-joint(D) off the drive shaft to create a gap in the drive line to allow removal of belts through gap. (refer to fig. 2)
5. Install new belts through gap and reverse process to tighten new belts. **Be sure to reset the gap between the U-Joints to between 3/64 to 3/16(F).** (refer to fig. 2)
6. Tighten all nuts and jam nuts.

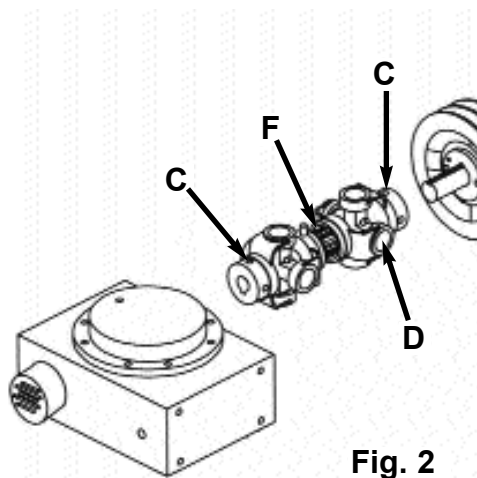


Fig. 2

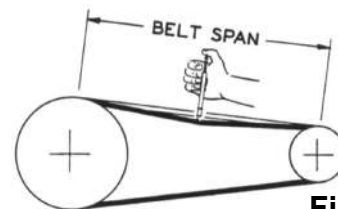


Fig. 3

- *Check tension frequently during the first 24-48 hours of operation.
- *Over tensioning shortens belt and bearing life.
- *Keep belts free from foreign material which may cause slip.
- *Make V-drive inspection on a periodic basis. Tension when slipping.

1.17 Control Linkage Lubrication

The control linkage is equipped with seven grease fittings 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.

1.18 Control Lever Adjustment

Be sure that the trowel is on a level surface. The control levers should line up evenly. If levers appear out of adjustment they can be re-adjusted forward or backwards as follows:

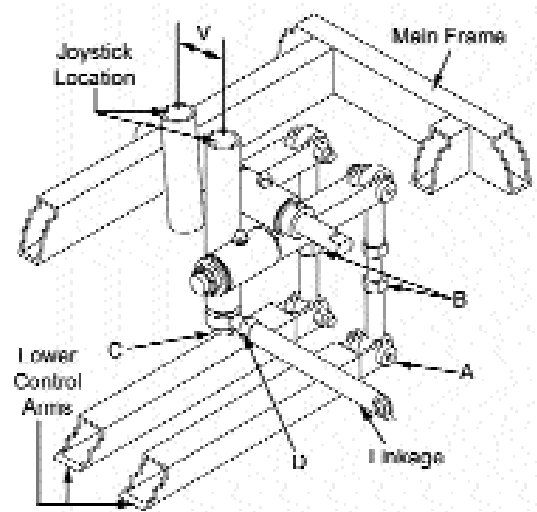
NOTE: Trowel must be placed on flat level surface that fully supports the blades on both rotors.

1. Remove bolts (A).
2. Loosen jam nuts (B).
3. Extend linkage to adjust control levers backward.
4. Shorten linkage to adjust linkage control levers forward.
5. After levers have been adjusted to the desired position, reassemble bolts (A) and tighten jam nuts (B).

1.19 Right Hand Control Lever Adjustment Right or Left

The right hand lever should be set to the same angle as that of the left to form a "V". If levers become out of adjustment adjust the right hand lever as follows:

1. Remove bolt (C).
2. Loosen jam nuts (D).
3. Extend linkage to move control levers to the right .
4. Shorten linkage to move control levers to the left.
5. After control lever has been adjusted to the desired position reassemble bolt (C). And tighten jam nuts (D).



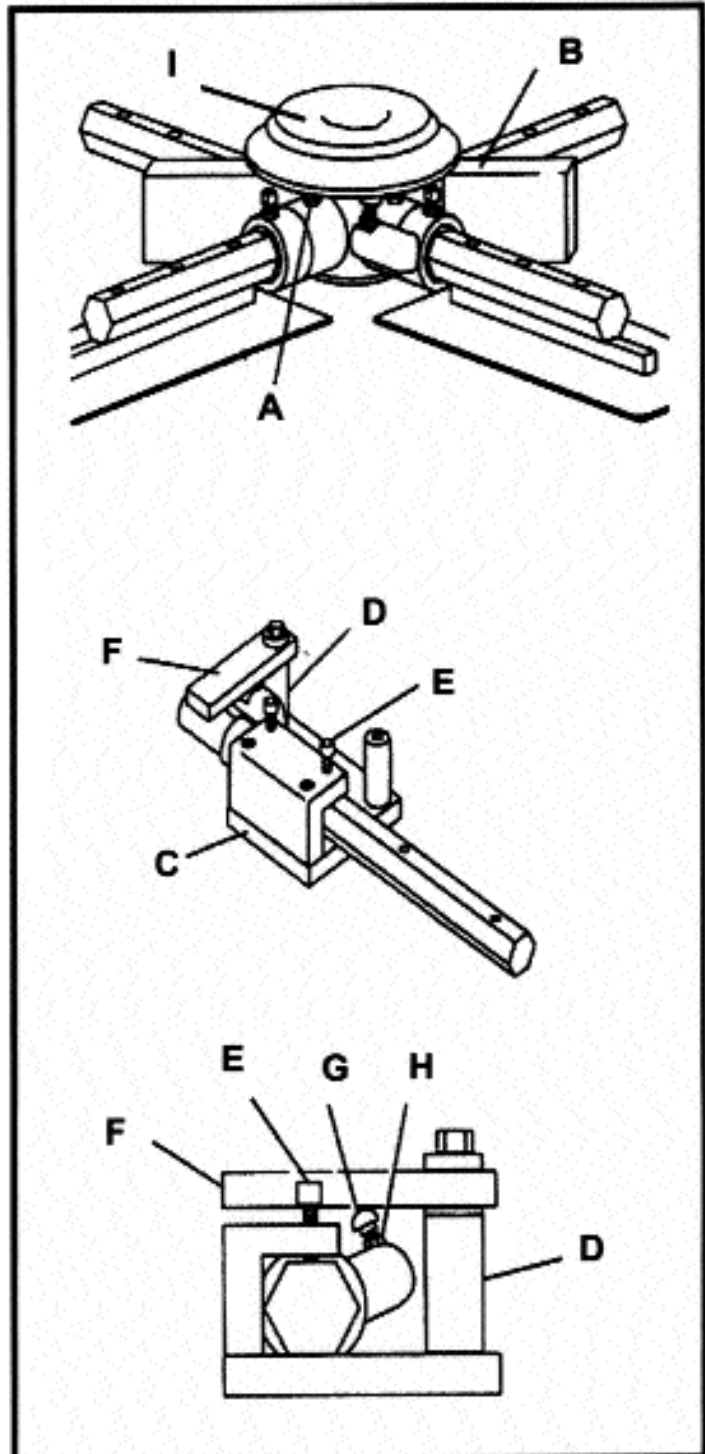
1.20 Lift Lever Adjustment

1A OPERATIONS

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 block (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 PRO 1200 SD 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 and 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).



1A OPERATIONS

1.21 Transporting Trowel

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

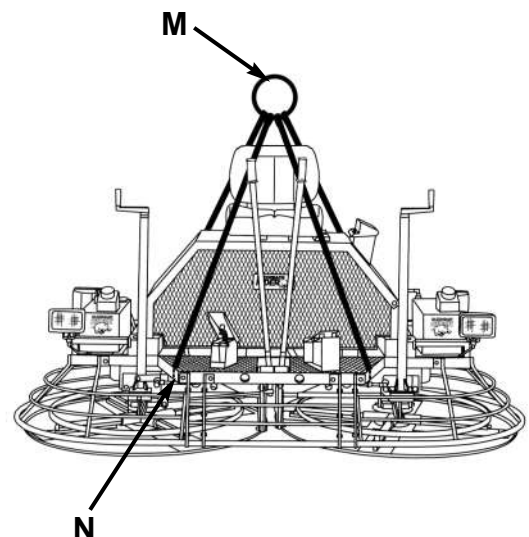
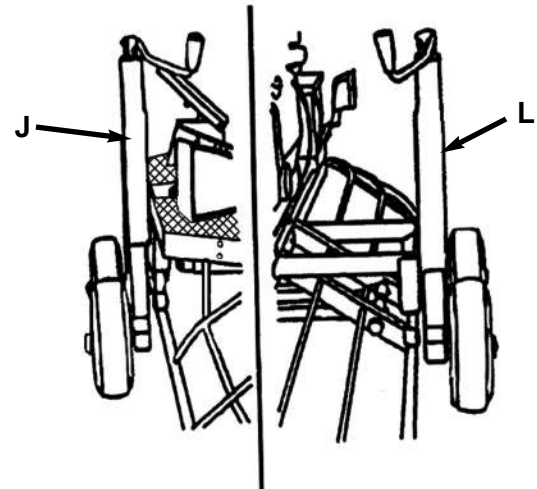
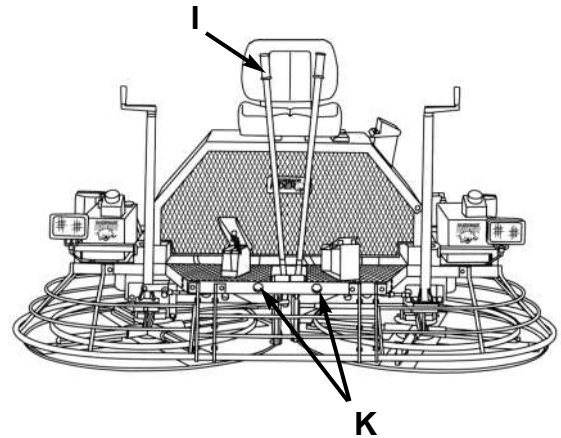
1. Inspect dolly jack for serviceability and damage.
2. Place riding trowel on firm level ground.
3. Tie steering levers (I) to frame to prevent them from tipping forward when trowel is being lifted.

4. 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.

5. Insert the rear 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.

6. 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.

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. Disengage Clutch.
2. Use a battery of the same voltage (12V) as is used with your engine.
3. 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.
4. 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.
5. 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.

PARTS INFORMATION TABLE OF CONTENTS

2A PARTS

Frame Assembly	.2A-2
Driveline Assembly	.2A-3
Engine Mount System	.2A-4-5
Clutch Assembly	.2A-6
Crosshead and Pivot Box Assembly	.2A-7
SD Gearbox Right Hand Sitting on Machine (SOM)	.2A-8&9
SD Gearbox Left Hand Sitting on Machine (SOM)	.2A-10&11
Fuel System Assembly	.2A-12&13
Electrical Components	.2A-14&15
Vanguard Electrical Diagram	.2A-16
Vanguard Control Panel Assembly	.2A-17
Pitch Control Assembly	.2A-18&19
Steering Lever Assembly	.2A-20&21
Spray System Assembly	.2A-22&23
Spider Assembly	.2A-24&25
Accessories	.2A-26-28

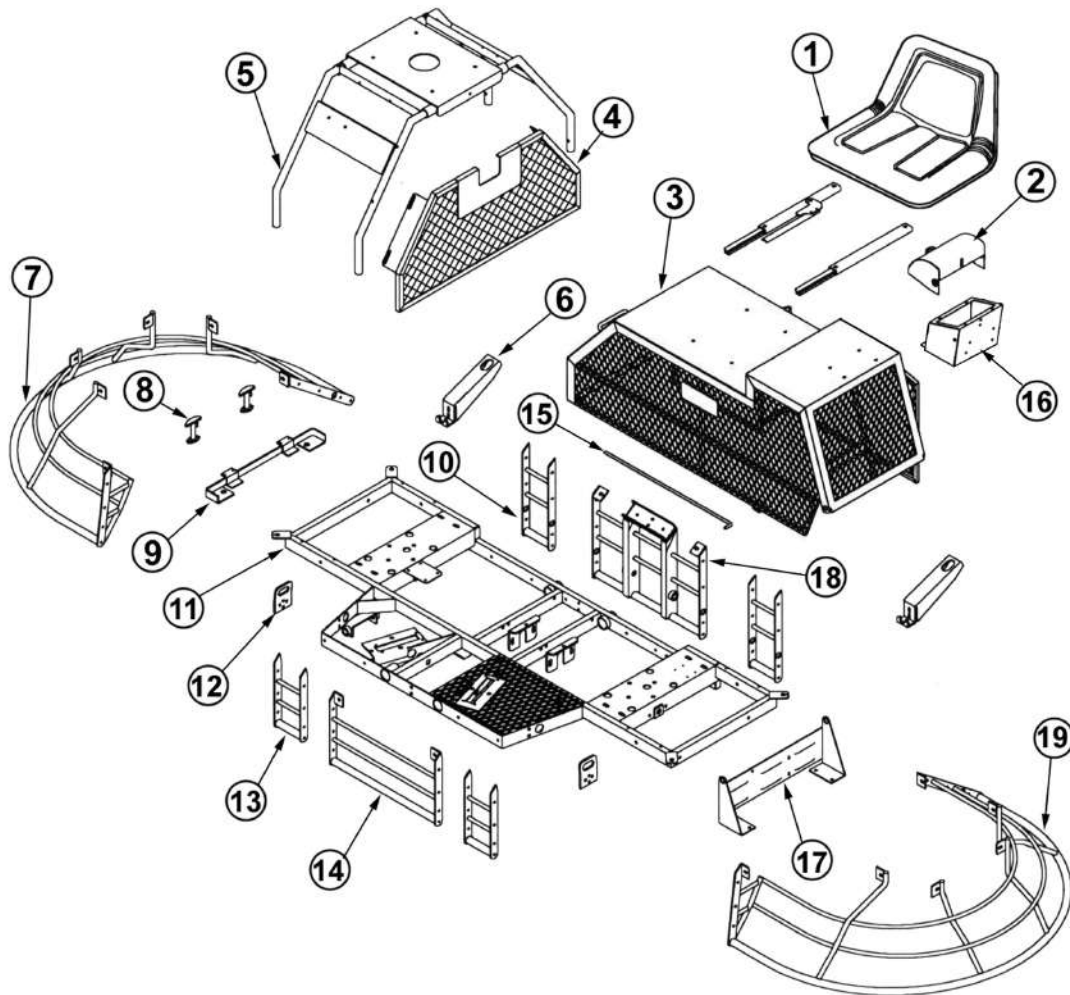
NOTE: All set screws used on PRO 1200 SD RIDERS have blue (LOC-TITE TM) applied at the factory. If set screw is removed or loosened for any reason re-apply blue (LOC-TITE TM).

NOTE: All grease fittings on PRO 1200 SD RIDERS 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.

NOTE: Anti-Seize is applied at the factory to all drive line coupling, gear box main and counter shafts and pitch control threaded rod assemblies. If these parts are disassembled re-apply a light coat of a graphite based anti-seize.

2A PARTS

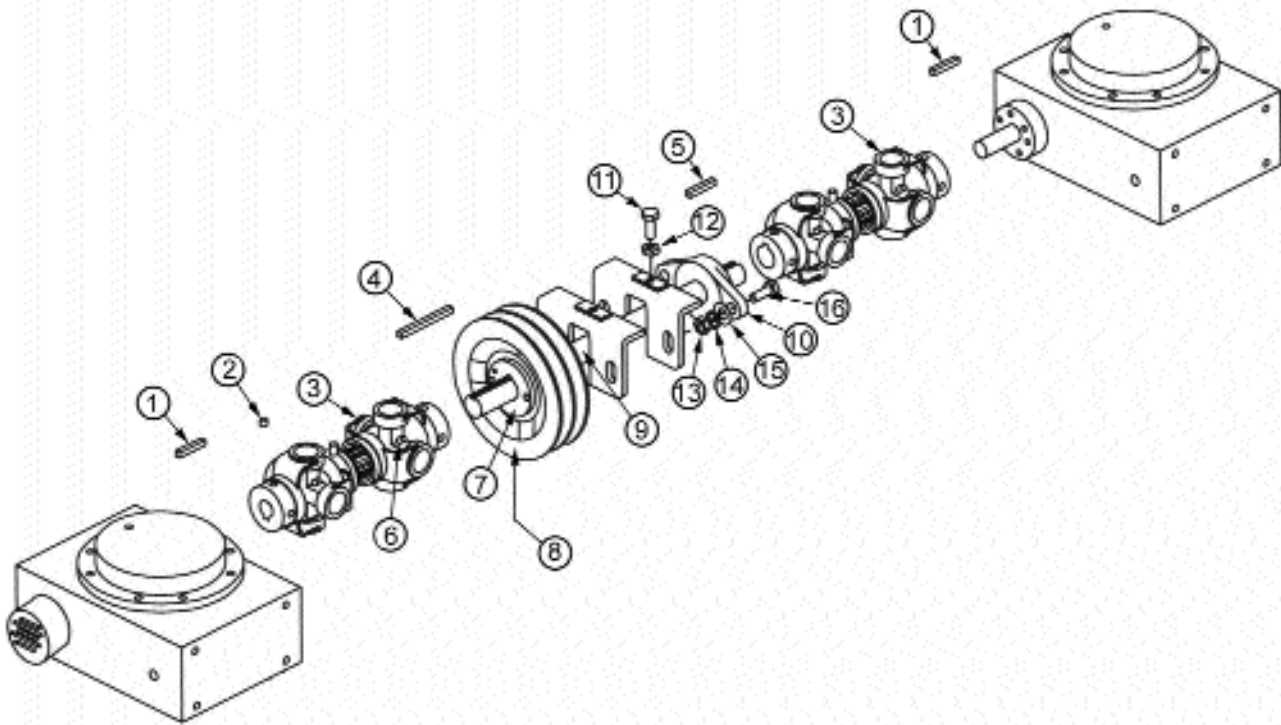
FRAME ASSEMBLY



ILL.	PART #	DESCRIPTION	QTY.
1.	.037769	SEAT W/ GLIDES	1
2.	.036871	CONTROL PANEL LID (VANGUARD)	1
3.	.039017	HOOD, SEAT (VANGUARD)	1
4.	.029007	GUARD, SEAT (LINAMAR)	1
5.	.026357	FRAME, SEAT (LINAMAR)	1
6.	.035533	LIFTING LUG REAR (VANGUARD ONLY)	2
7.	.034269	RING, END RH	1
8.	.022738	HOOD LATCH (VANGUARD ONLY)	2
9.	.035502	HOOD REST (VANGUARD ONLY)	1
10.	.026980	SPACER, REAR RING (NOL MACHINES ONLY)	2
11.	.038986	FRAME, MAIN (OL VANGUARD)	1
	.032091	FRAME, MAIN (OL LINAMAR)	1
	.032093	FRAME, MAIN (NOL LINAMAR)	1
	.038985	FRAME, MAIN (NOL VANGUARD)	1
12.	.029890	LIFTING LUG FRONT (VANGUARD ONLY)	2
13.	.026979	SPACER, FRONT RING (NOL MACHINES ONLY)	2
14.	.026961	RING, FRONT	1
15.	.037806	HOOD PROP (VANGUARD ONLY)	1
16.	.039009	BOX, CONTROL PANEL (VANGUARD ONLY)	1
17.	.035523	PIVOT, HOOD (VANGUARD ONLY)	1
18.	.026962	RING, REAR	1
19.	.034268	RING, END LH	1

DRIVELINE ASSEMBLY

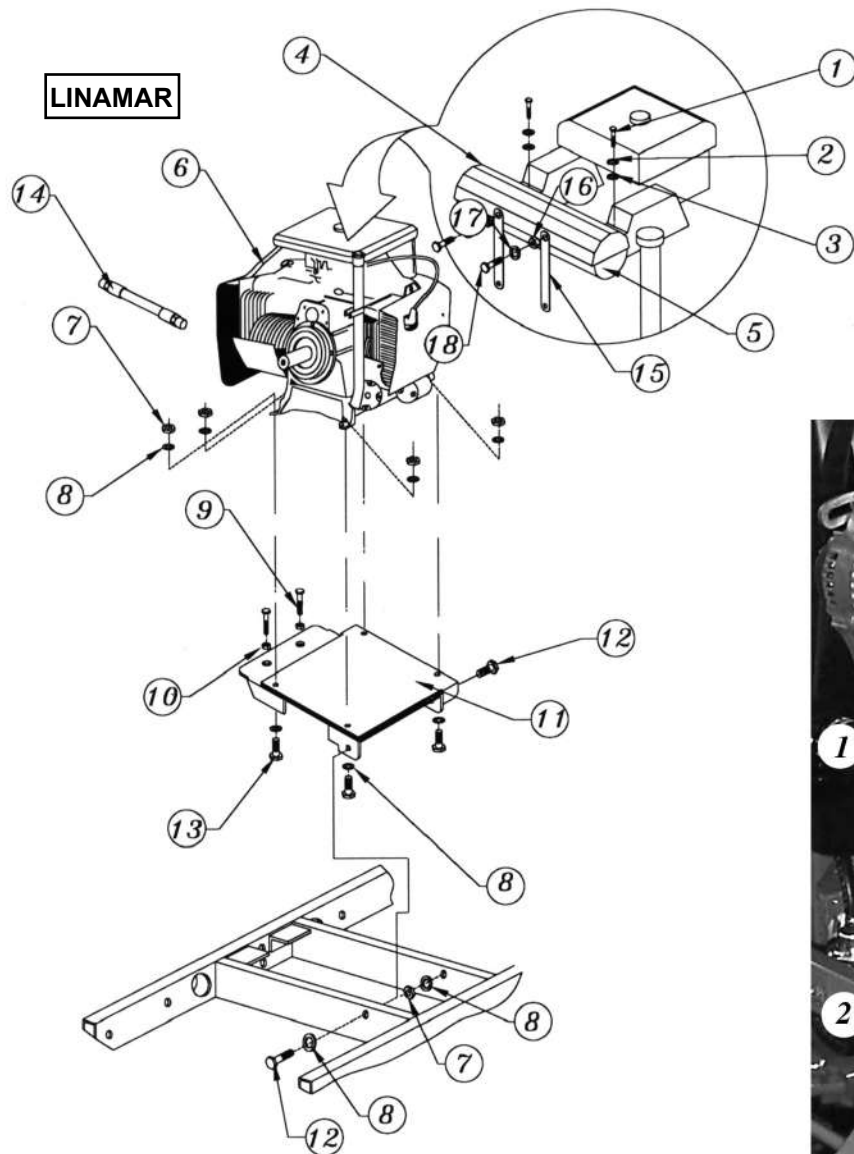
2A PARTS



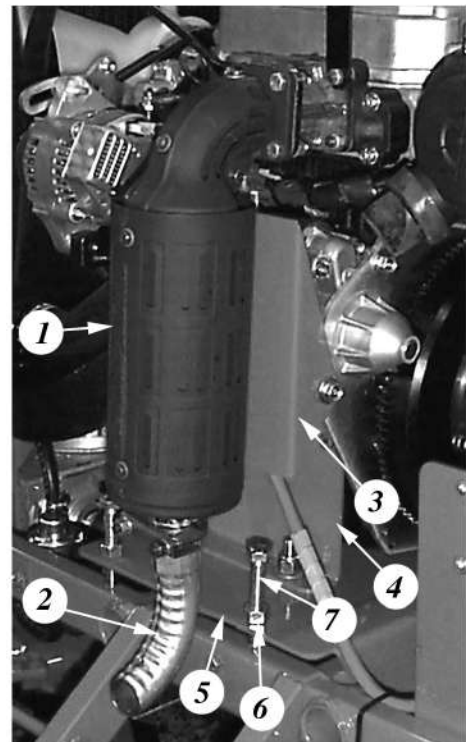
ILL.	PART #	DESCRIPTION	QTY.
1.....	.010307	KEY, 1/4" X 2"	.2
2.....	.032745	PLUG, PLASTIC 1/8-27	.8
3.....	.028622	U-JOINT ASSEMBLY	.2
4.....	.024820	KEY, 1/4" X 4"	.1
5.....	.015696	KEY, 1/4" X 1-1/4"	.1
6.....	.010513	GREASE FITTING 1/8-27 NPT	.8
7.....	.010306	BUSHING, H 1"	.1
8.....	.022551	PULLEY, 2B-6.6 (NOL-LINAMAR)	.1
	.034577	PULLEY, 2BK-70H (OL-LINAMAR & NOL-VANGUARD)	.1
	.026445	PULLEY, 2BK-65H (OL-VANGUARD)	.1
9.....	.032711	SHAFT, DRIVE 14 X 1 (OL ONLY)	.1
	.039134	SHAFT, DRIVE 19-1/2 X 1 (NOL ONLY)	.1
10.....	.019334	BEARING, 2-BOLT FLANGE 1"	.1
11.....	.010036	BOLT, 3/8-16 X 1	.2
12.....	.028623	COVER, DUST F/ U-JOINT	.2
13.....	.010104	NUT, HEX 7/16-14	.4
14.....	.010092	WASHER, LOCK 7/16	.4
15.....	.011490	WASHER, FLAT 1/2 HARDENED	.4
16.....	.010054	BOLT, 7/16-14 X 1-1/2"	.4

2A PARTS

ENGINE MOUNT SYSTEM



VANGUARD



LINAMAR ENGINE MOUNTING SYSTEM PARTS LIST

ILL.	PART #	DESCRIPTION	QTY.
1.....	010002	FSTN, HHCS 1/4-20 X 3/4	2
2.....	010089	FSTN, LW 1/4	2
3.....	010081	FSTN, FW 1/4	2
4.....	026430	GUARD, MUFFLER 24 HP	1
5.....	032294	MUFFLER, LINAMAR 24 HP	1
6.....	026329	ENGINE, LINAMAR 24 HP	1
7.....	020514	FSTN, NUT STOVER LOCK 3/8-16	6
8.....	017751	FSTN, FW HARD A235 3/8	8
9.....	038388	FSTN, HHTB 1/2-13 X 3	2
10.....	010106	NUT, HEW 1/2-13	2
11.....	039336	PLATE, ENGINE MOUNT	1
12.....	010039	FSTN, HHCS 3/8-16 X 1-3/4	2
13.....	010038	FSTN, HHCS 3/8-16 X 1-1/2	4
14.....	028806	HOSE, OIL DRAIN	1
15.....	033027	STRAP, MUFFLER GUARD	2
16.....	020514	FSTN, NUR STOVER LOCK 3/8-16	2
17.....	017751	FSTN, FW HARD A235 3/8	2
18.....	010038	FSTN, HHCS 3/8-16 X 1-1/2	2

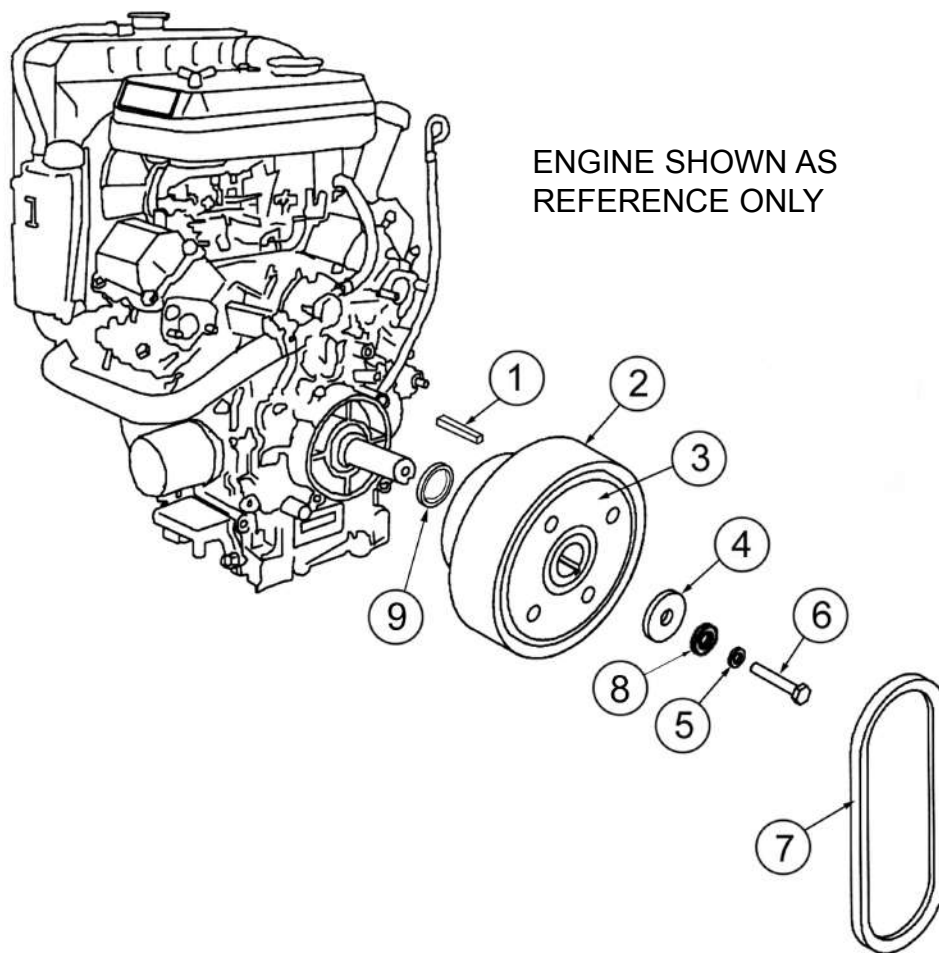
VANGUARD ENGINE MOUNTING SYSTEM PARTS LIST

ILL.	PART #	DESCRIPTION	QTY.
1.....	038728	KIT, VANGUARD MUFFLER	1
2.....	039014	TAILPIPE, VANGUARD MUFFLER	1
3.....	039003	SUPPORT, VANGUARD MUFFLER	1
4.....	038994	MOUNT, VANGUARD REAR MOTOR	1
5.....	038996	MOUNT, VANGUARD BOTTOM MOTOR	1
6.....	010106	FSTN, 1/2-13 HEX NUT	2
7.....	022898	FSTN, HHTB 1/2-13 X 2-1/2	2
8.....	038730	ENGINE, VANGUARD 31 HP (NOT SHOWN)	1
9.....	038995	MOUNT, VANGUARD FRONT MOTOR (NOT SHOWN)	1
10.....	038998	BRKT, VANGUARD WATER PUMP (NOT SHOWN)	1
11.....	038999	SPACER, VANGUARD FRONT ENG. (NOT SHOWN)	1
12.....	039000	SPACER, VANGUARD REAR ENG. (NOT SHOWN)	1
13.....	039002	BRKT, VANGUARD AIR CLEANER (NOT SHOWN)	1
14.....	039003	SUPPORT, VANGUARD MUFFLER (NOT SHOWN)	1
15.....	039006	EXTENSION, VANGUARD MUFFLER (NOT SHOWN)	1

PARTS THAT ARE NOT SHOWN ARE LISTED ABOVE FOR PART NUMBER REFERENCE WHEN ORDERING.

2A PARTS

CLUTCH ASSEMBLY



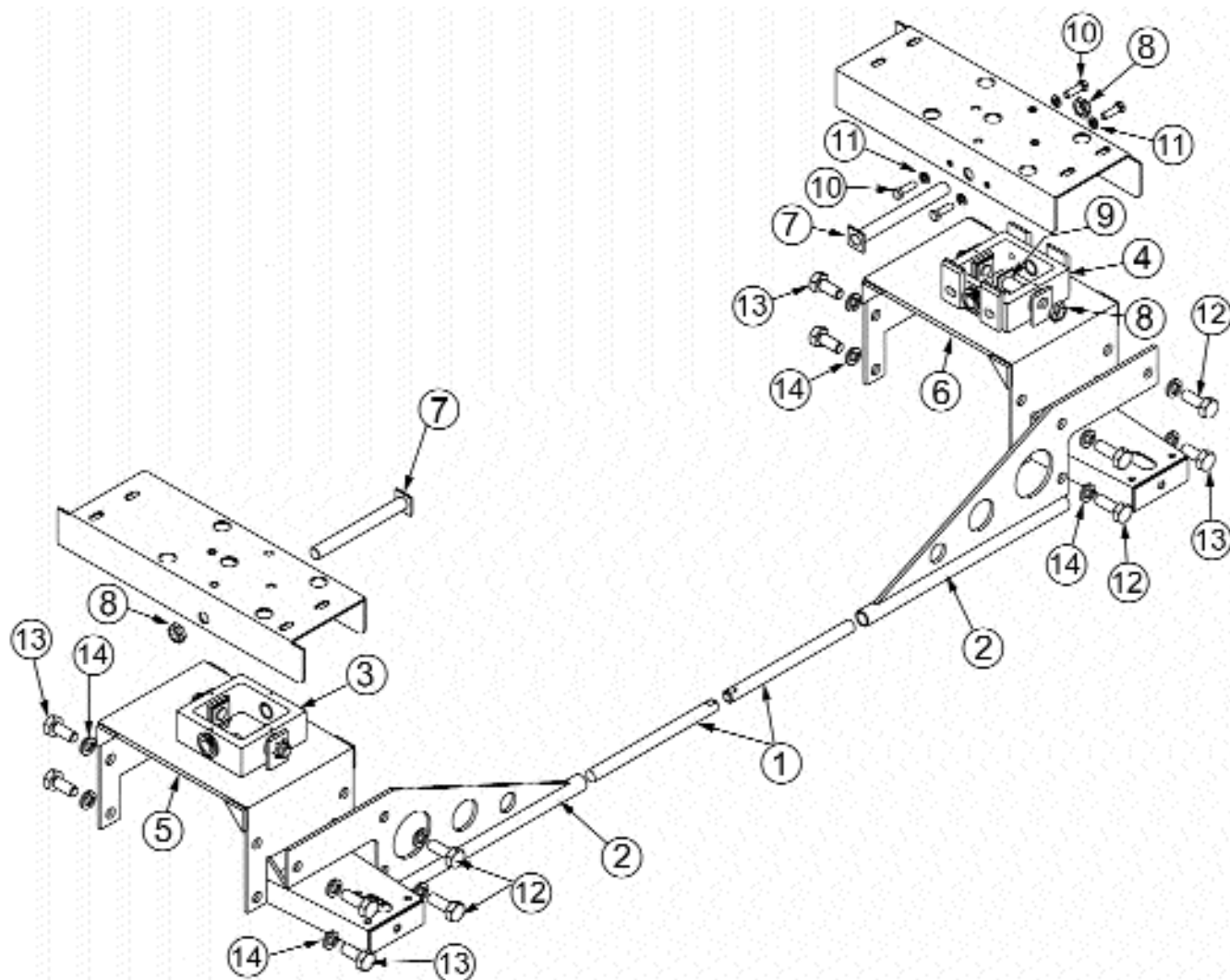
ILL.	PART #	DESCRIPTION	QTY.
1.	.026992	KEY	.1
2.	.032685	DRIVEN BODY - OUTER CLUTCH BODY (BLUE)	.1
	.038933	DRIVEN BODY - OUTER CLUTCH BODY (GREEN)	.1
3.	.033447	INNER CLUTCH ASSEMBLY (BLUE)	.1
	.038934	INNER CLUTCH ASSEMBLY (GREEN)	.1
4.	.026433	PRESSURE WASHER (LINAMAR)	.1
	.032728	PRESSURE WASHER (VANGUARD)	.1
5.	.010091	FSTN, LW 3/8" (LINAMAR)	.1
	.010092	FSTN, LW 7/16" (VANGUARD)	.1
6.	.039156	BOLT, CLUTCH (VANGUARD)	.1
	.010049	BOLT, CLUTCH (LINAMAR) (GREEN CLUTCH)	.1
	.032973	BOLT, CLUTCH (LINAMAR) (BLUE CLUTCH)	.1
7.	.039745	V-BELT 2BX-40 GOODYEAR (OL-LINAMAR)	.1
	.039657	V-BELT 2BX-35 GOODYEAR (OL-VANGUARD)	.1
	.039748	V-BELT 2BX-42 GOODYEAR (NOL-LINAMAR)	.1
	.039743	V-BELT 2BX-36 GOODYEAR (NOL-VANGUARD)	.1
8.	.011490	FSTN, FW 1/2" (VANGUARD ONLY)	.1
9.	.039353	SPACER, 1/4" CLUTCH (VANGUARD) (GREEN CLUTCH ONLY)	.1
	.029559	SPACER, 1" CLUTCH (NOL-LINAMAR)	.1
	.026469	SPACER, 3/4" CLUTCH (OL-LINAMAR)	.1

8" CLUTCH W/ 1-1/8" BOREPART# 034113 (VANGUARD)

8" CLUTCH W/ 1-7/16" BOREPART# 032656 (LINAMAR)

CROSSHEAD AND PIVOT BOX ASSEMBLY

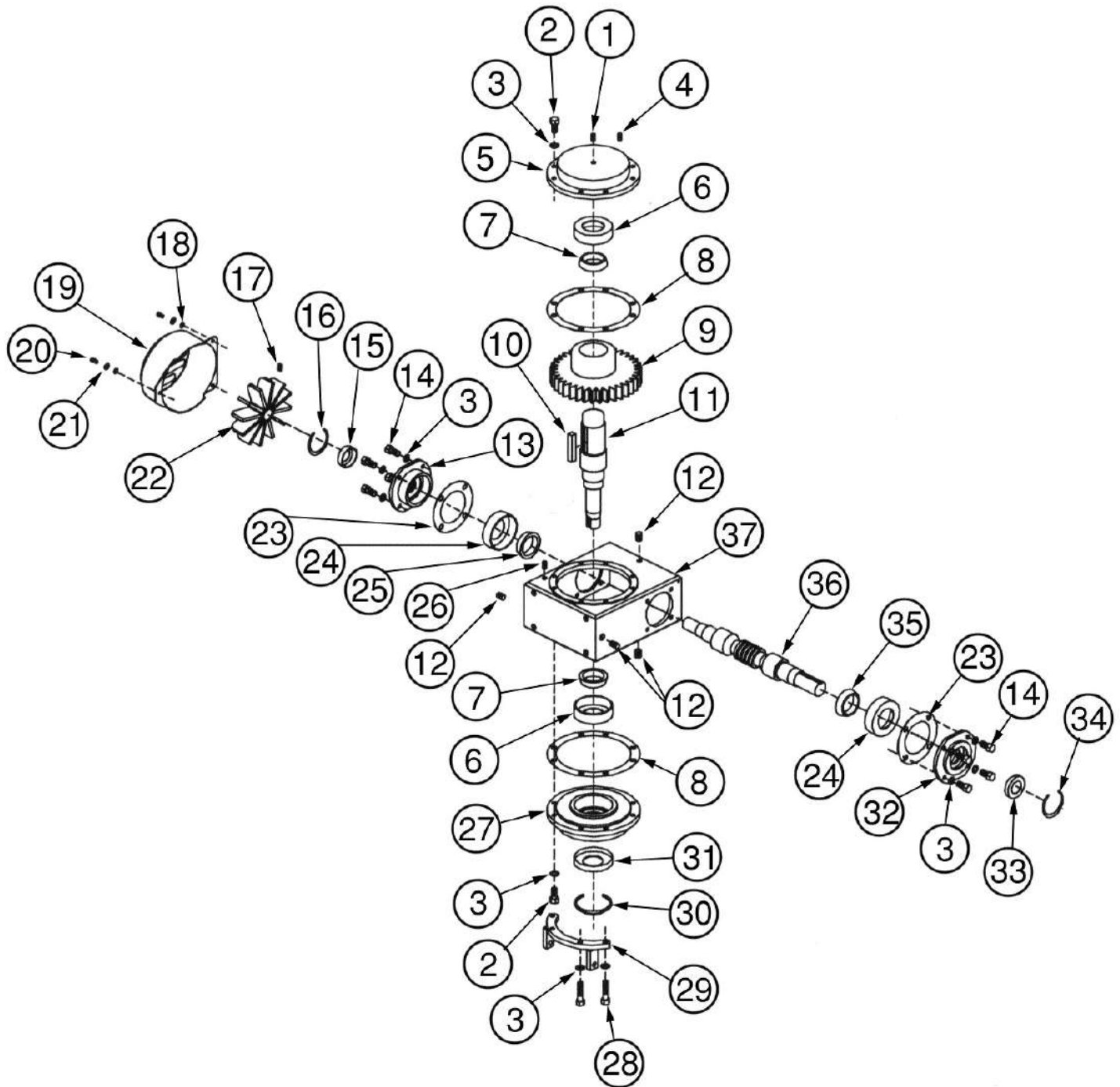
2A PARTS



ILL.	PART #	DESCRIPTION	QTY.
1.....	026238	INSERT, CONTROL ARM	2
2.....	026970	ARM, CROSSHEAD	2
3.....	028326R	BOX, CROSSHEAD RH	1
4.....	033927	BOX, CROSSHEAD LH	1
5.....	026945R	RH CROSSHEAD WELDMENT	1
6.....	026945L	LH CROSSHEAD WELDMENT	1
7.....	026178	BOLT, CROSSHEAD MTG (LONG)	2
8.....	026447	NUT, SELFLOCK THIN 3/4-10	6
9.....	026175	BOLT, CROSSHEAD MTG (SHORT)	2
10.....	032875	BOLT, 3/8-16 X 1-1/4	4
11.....	010091	LW, 3/8	4
12.....	019969	BOLT, 5/8-11 X 1-3/4	6
13.....	020915	BOLT, 5/8-11 X 1-1/2	10
14.....	010095	LW, 5/8	16
15.....	026462	PLUG, CHROME 1/2" (NOT SHOWN)	8
16.....	026463	PLUG, CHROME 1" (NOT SHOWN)	10
17.....	026842	PLUG, RUBBER	4

2A PARTS

SUPER DUTY (SD) GEARBOX RIGHT HAND SITTING ON MACHINE(SOM) PART#: 029141



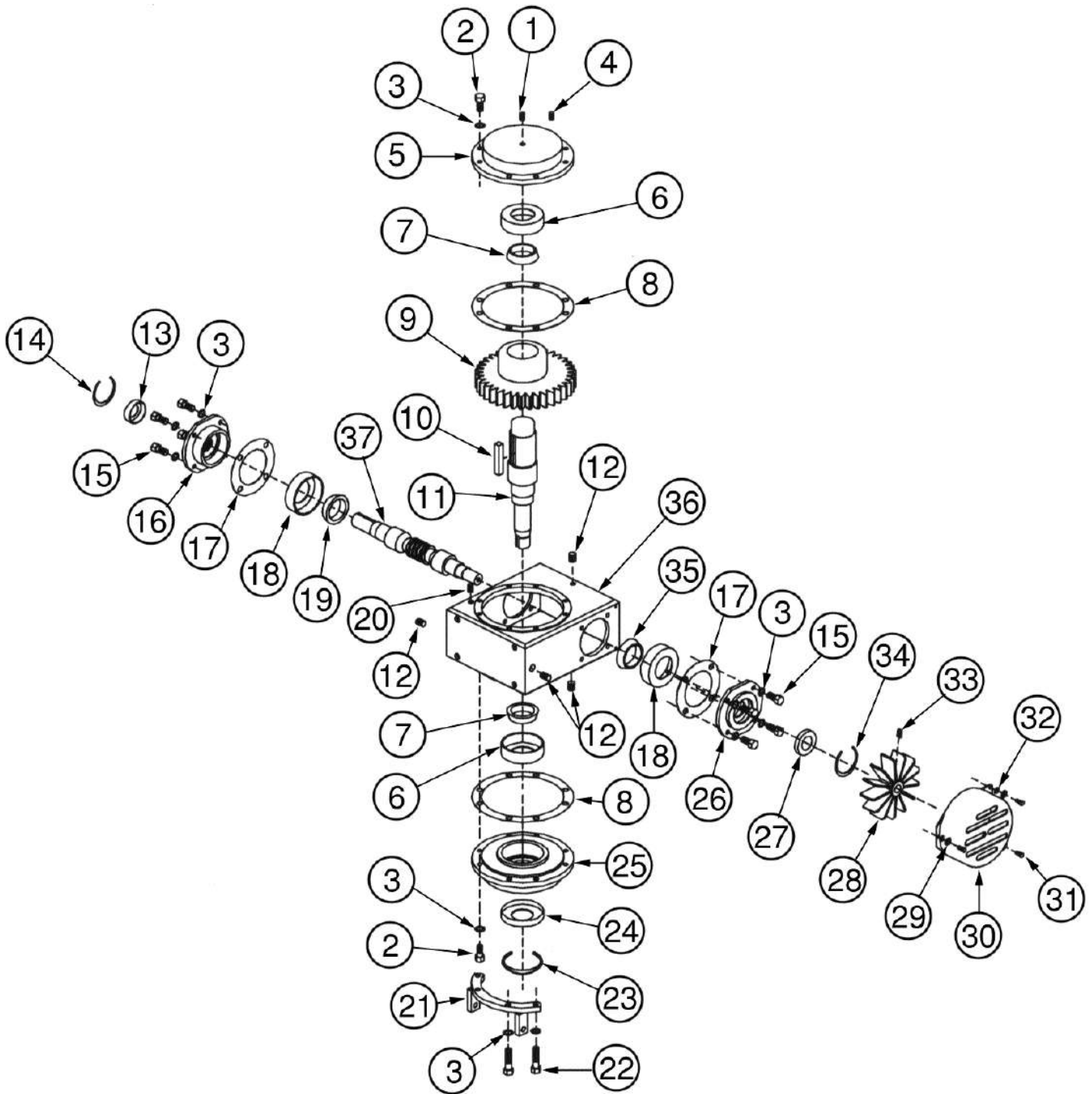
(SD) GEARBOX RIGHT HAND (SOM)
PART#: 029141 (cont'd)

2A
PARTS

ILL.	PART #	DESCRIPTION	QTY.
1.	.010513	GREASE SERT 1/4-28	1
2.	.010038	BOLT, 3/8-16 X 1 1/2	12
3.	.010091	WASHER, LOCK 3/8	24
4.	.032745	PLUG, PLASTIC P-18 1/8-27	1
5.	.029150	PLATE, TOP	1
6.	.029184	TIMKEN RACE 3720	2
7.	.029183	TIMKEN CONE 3780	2
8.	.028914	SHIMS	AS REQ
9.	.029148	GEAR, BRONZE IRON LEFT	1
10.	.029146	KEY, GEAR	1
11.	.029151	MAINSHAFT, LH SD	1
12.	.010498	PLUG	4
13.	.029147	FLANGE, GEARBOX	1
14.	.010037	BOLT, 3/8-16 X 1 1/4	8
15.	.029181	NATIONAL SEAL 471705	1
16.	.032713	RING, RETAINING UR175	1
17.	.012869	SCREW, SET 1/4-20 X 3/8	1
18.	.018072	WASHER, FLAT 3/16 SAE	3
19.	.028703	SHROUD, FAN	1
20.	.013484	SCREW, 10-24 X 1/2	3
21.	.013740	WASHER, LOCK #10	3
22.	.034541	FAN	1
23.	.028915	SHIMS	AS REQ
24.	.029272	TIMKEN RACE HM89410	2
25.	.029182	TIMKEN CONE HM89443	1
26.	.029529	VALVE, RELIEF 1/8-27 NPT	1
27.	.029155	PLATE, BOTTOM	1
28.	.026775	BOLT, 3/8-16 X 2	4
29.	.032716	BRKT, MOUNT	1
30.	.032715	RING, RETAINING UR275	1
31.	.029180	NATIONAL SEAL 472572	1
32.	.029154	CAP, END	1
33.	.029179	NATIONAL SEAL 473215	1
34.	.032714	RING, RETAINING UR237	1
35.	.029178	TIMKEN CONE HM89448	1
36.	.029144	SHAFT, COUNTER L.H. WORM	1
37.	.029143	CASE, GEARBOX	1

2A PARTS

SUPER DUTY (SD) GEARBOX LEFT HAND SITTING ON MACHINE(SOM) PART#: 029142



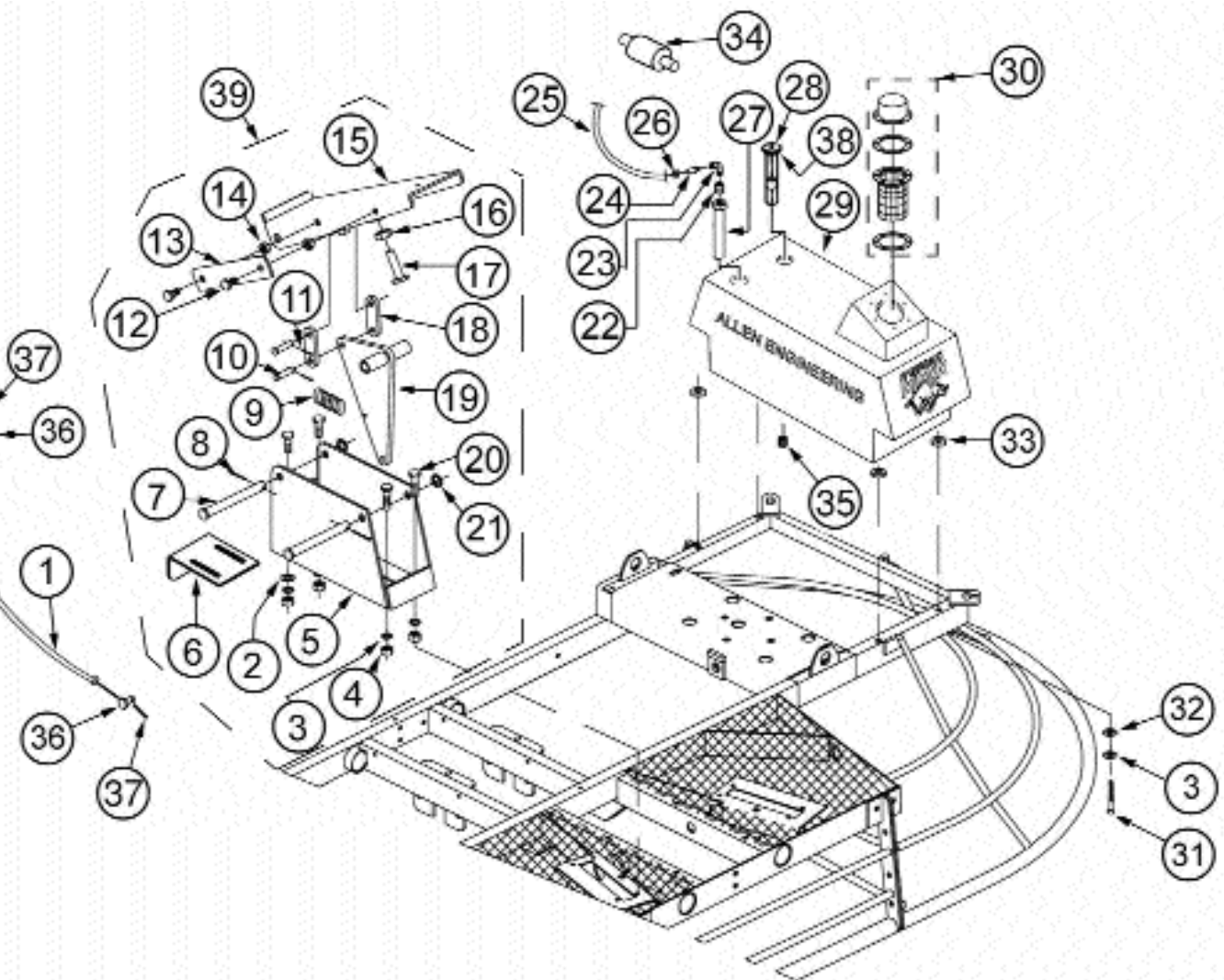
SD GEARBOX LEFT HAND SOM
PART#: 029142 (cont'd)

2A
PARTS

ILL.	PART #	DESCRIPTION	QTY.
1.	010513	GREASE SERT 1/4-28	.1
2.	010038	BOLT, 3/8-16 X 1 1/2	.12
3.	010091	WASHER, LOCK 3/8	.24
4.	032745	PLUG, PLASTIC P-18 1/8-27	.1
5.	029150	PLATE, TOP	.1
6.	029184	TIMKEN RACE 3720	.2
7.	029183	TIMKEN CONE 3780	.2
8.	028914	SHIMS	AS REQ
9.	029149	GEAR, BRONZE IRON RIGHT	.1
10.	029146	KEY, GEAR	.1
11.	029152	MAINSHAFT, R.H. SD	.1
12.	010498	PLUG	.4
13.	029179	NATIONAL SEAL 473215	.1
14.	032714	RING, RETAINING UR237	.1
15.	010037	BOLT, 3/8-16 X 1 1/4	.8
16.	029154	CAP, END	.1
17.	028915	SHIMS	AS REQ
18.	029272	TIMKEN RACE HM89410	.2
19.	029178	TIMKEN CONE HM89448	.1
20.	029529	VALVE, RELIEF 1/8-27 NPT	.1
21.	032716	BRKT, MOUNT	.1
22.	026775	BOLT, 3/8-16 X 2	.4
23.	032715	RING, RETAINING UR275	.1
24.	029180	NATIONAL SEAL 472572	.1
25.	029155	PLATE, BOTTOM	.1
26.	029147	FLANGE, GEARBOX	.1
27.	029181	NATIONAL SEAL 471705	.1
28.	034514	FAN	.1
29.	013740	WASHER, LOCK #10	.3
30.	028703	SHROUD, FAN	.1
31.	013484	SCREW, 10-24 X 1/2	.3
32.	018072	WASHER, FLAT 3/16 SAE	.3
33.	012869	SCREW, SET 1/4-20 X 3/8	.1
34.	032713	RING, RETAINING UR175	.1
35.	029182	TIMKEN CONE HM89443	.1
36.	029143	CASE, GEARBOX	.1
37.	029145	SHAFT, COUNTER R.H. WORM	.1

2A PARTS

FUEL SYSTEM ASSEMBLY



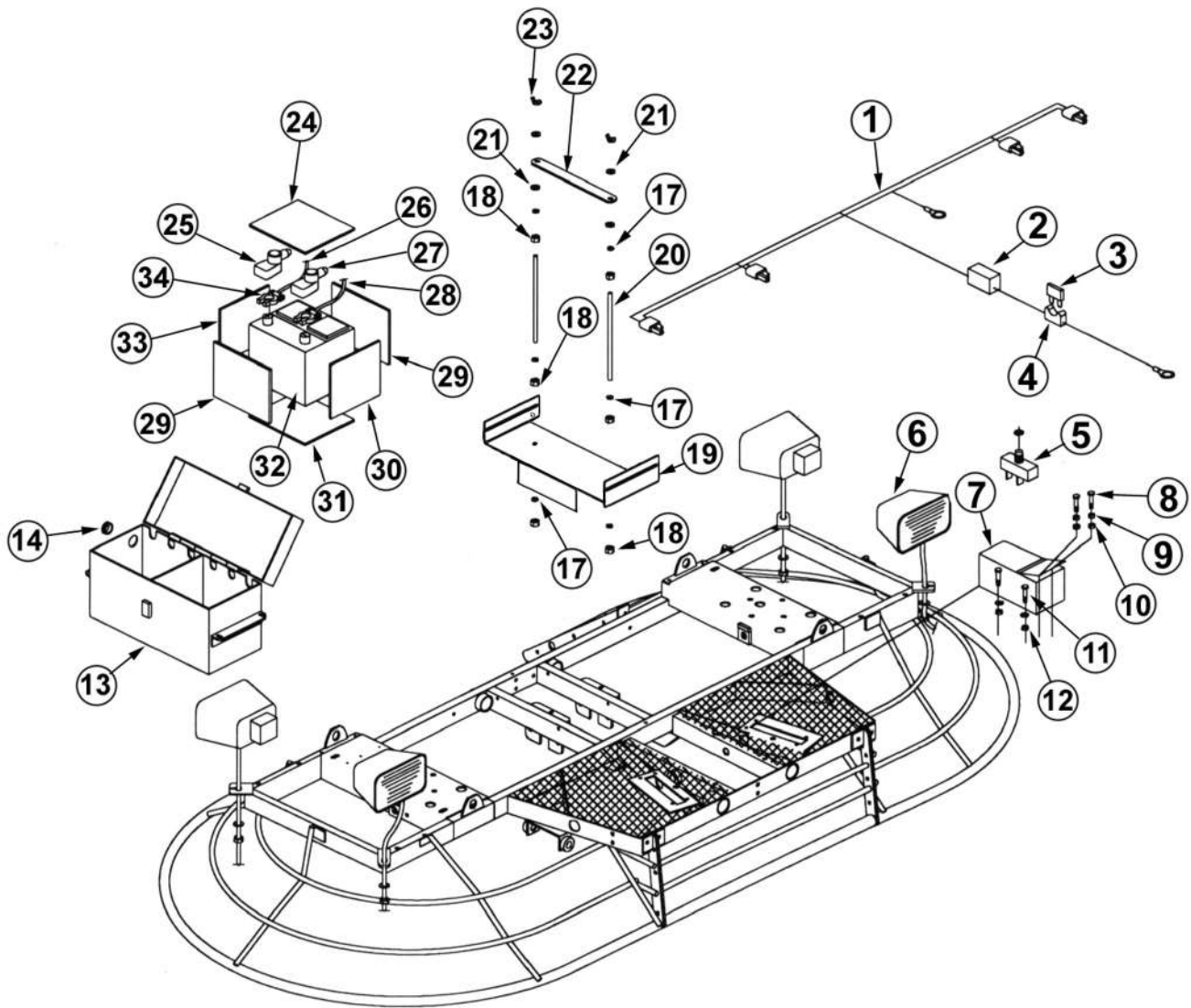
FUEL SYSTEM ASSEMBLY (cont'd)

2A PARTS

ILL.	PART #	DESCRIPTION	QTY.
1.	028243	THROTTLE CABLE 52" HD (LINAMAR)	1
	035796	THROTTLE CABLE 36" HD (VANGUARD)	1
2.	010081	FLAT WASHER 1/4	10
3.	010089	LOCK WASHER 1/4	4
4.	010098	HEX NUT 1/4-20	4
5.	024851	BASE, FOOT SPEED	1
6.	028526	BRACKET, LOWER HD THROTTLE CABLE	1
7.	028895	PIN, CLEVIS 3/8 x 3 1/2	1
8.	026226	PIN, COTTER 3/32 x 3/4	2
9.	024981	SPRING	1
10.	024982	PIN, CLEVIS 1/4 x 51/64	2
11.	010131	PIN, COTTER 1/16 x 1	2
12.	010001	BOLT, 1/4-20 x 1/2	2
13.	024985	PLATE, STOP	1
14.	020542	NUT, STOVER 1/4-20	2
15.	024839	PEDAL, FOOT SPEED	1
16.	010100	NUT, HEX 5/16-18	1
17.	010021	BOLT, 5/16-18 x 1 1/4	1
18.	024850	SHACKLE	2
19.	024847	FULCRUM, FOOT SPEED	1
20.	010003	BOLT, 1/4-20 x 1	2
21.	010082	FLAT WASHER 5/16	2
22.	012941	BUSHING, 1/2 x 1/4 HEX	1
23.	010220	ELBOW, 1/4 x 1/4 90° STREET	1
24.	010193	FTG, PUSHLOK 1/4 x 1/4-18	1
25.	019429	HOSE, FUEL 5/16 DIA.	AS REQ.
26.	019430	CLAMP, #4 HOSE	4
27.		TUBE, SUCTION (COMES WITH FUEL TANK)	1
28.	032295	GAUGE, GAS REMOTE	1
29.	039355	TANK, FUEL W/CAP	1
	039356	TANK, WATER W/CAP	2
30.	039278R	CAP, RED FUEL FILTER ASSEMBLY	1
	039278B	CAP, BLUE WATER FILTER ASSEMBLY	1
31.	010006	BOLT, 1/4-20 x 1 3/4	4
32.	010081	FLAT WASHER 1/4	4
33.	015713	BUSHING, RUBBER	4
34.	023660	IN-LINE FUEL FILTER	1
35.	010497	PLUG, 1/4 NPT BI SQ. PIPE	1
36.	024984	PIVOT, FOOT SPEED CONTROL	2
37.	010131	PIN, COTTER 1/16 x 1	2
38.	034111	GROMMET, RUBBER F/ GAS GUAGE	1
39.	024838	LINAMAR THROTTLE PEDAL ASSY	1
	039137	VANGUARD THROTTLE PEDAL ASSY	1

2A PARTS

ELECTRICAL COMPONENTS



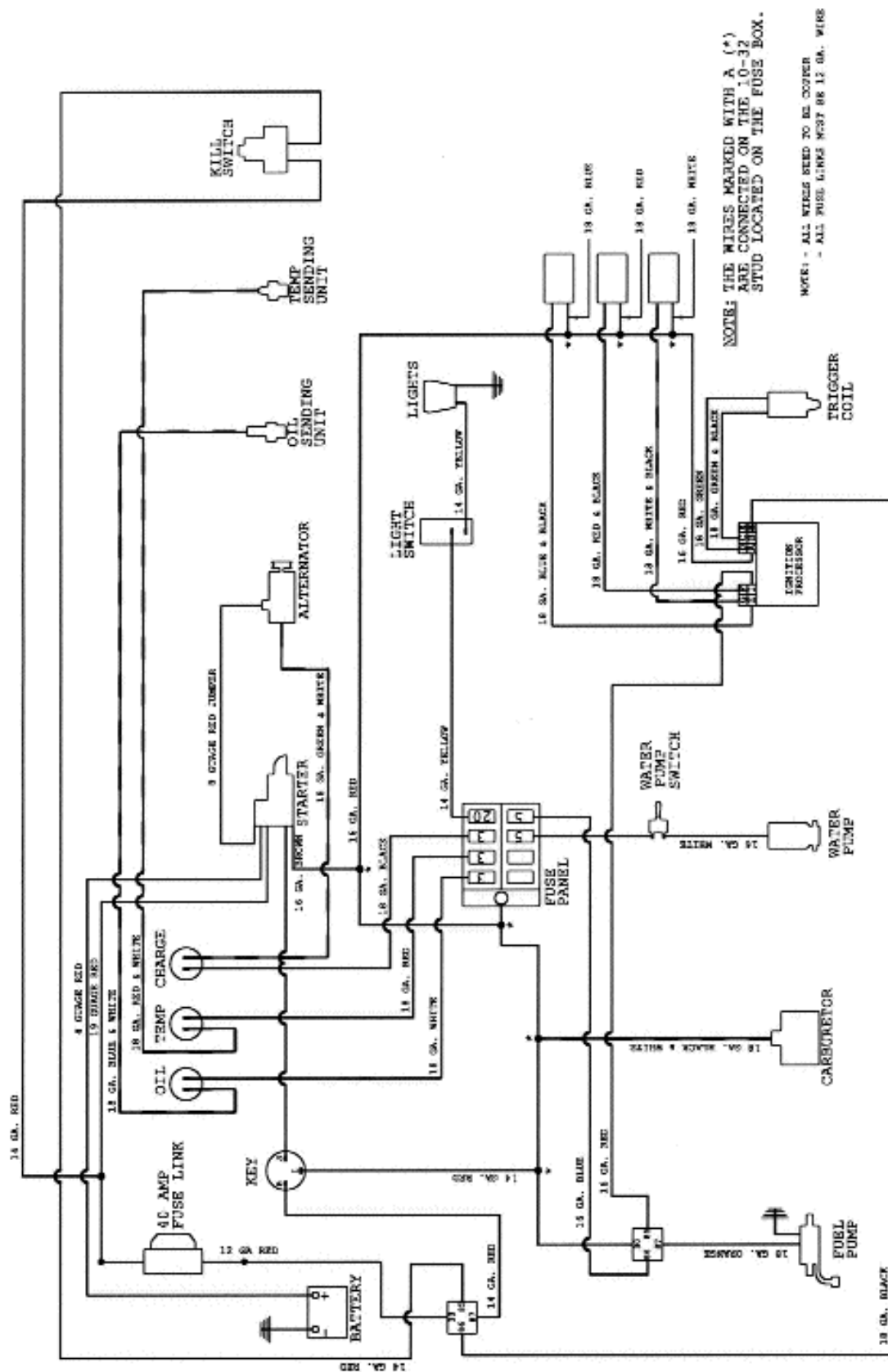
ELECTRICAL COMPONENTS (cont'd)**2A
PARTS**

ILL.	PART #	DESCRIPTION	QTY.
1.	029303	4 LIGHT WIRING HARNESS	1
2.	032125	SWITCH, ROCKER (VANGUARD)	1
	022028	SWITCH, TOGGLE (LINAMAR)	1
3.	034524	FUSE, 20 AMP	1
4.	026461	FUSE HOLDER	1
5.	032468	KILL SWITCH ASSEMBLY (LINAMAR)	1
	037800	KILL SWITCH ASSEMBLY (VANGUARD)	1
6.	036881	LIGHT, 12 VOLT	4
7.	038068	KILL SWITCH MOUNT	1
8.	010019	BOLT, 5/16-18 X 3/4	2
9.	010090	LOCK WASHER 5/16	2
10.	010082	FLAT WASHER 5/16	2
11.	010002	BOLT, 1/4-20 X 3/4	2
12.	010098	NUT, HEX 1/4-20	2
13.	036796	BATTERY & TOOLBOX (LINAMAR)	1
14.	024629	GROMMET, RUBBER (LINAMAR)	1
17.	010091	LOCK WASHER 3/8 (VANGUARD ONLY)	4
18.	015684	NUT, HEX 3/8-16 (VANGUARD ONLY)	4
19.	038992	PLATE, BATTERY MOUNT (VANGUARD ONLY)	1
20.	036933	ROD, BATTERY HOLDER (VANGUARD ONLY)	2
21.	017751	FLAT WASHER HARD 3/8 (VANGUARD ONLY)	4
22.	033825	CLAMP, BATTERY (VANGUARD ONLY)	1
23.	013531	NUT, WING 3/8-16 (VANGUARD ONLY)	2
24.	026453	CUSHION, BATTERY TOP (LINAMAR)	1
25.	035597	TERMINAL COVER (POSITIVE)	1
26.	019490	CABLE, POSITIVE F/ BATTERY	AS REQ.
27.	035598	TERMINAL COVER (NEGATIVE)	1
28.	026435	CABLE, NEGATIVE F/BATTERY	AS REQ.
29.	026427	CUSHION, BATTERY SIDE F & R (LINAMAR)	2
30.	026429	CUSHION, BATTERY END W/O HOLE (LINAMAR)	1
31.	026426	CUSHION, BATTERY BOTTOM	1
32.	023855	BATTERY, 12 VOLT	1
33.	026428	CUSHION, BATTERY END W/ HOLE (LINAMAR)	1
34.	023869	TERMINAL, BATTERY POST	2

2A PARTS

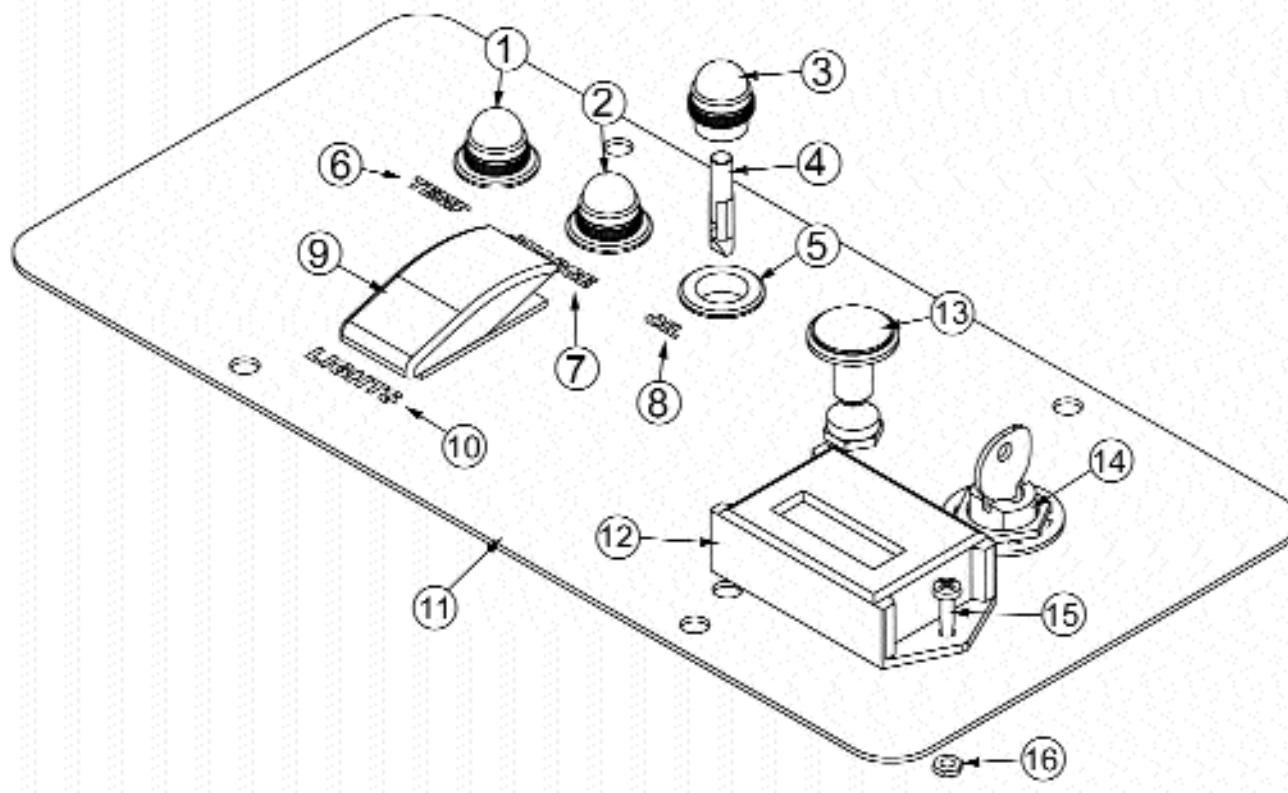
VANGUARD WIRING DIAGRAM

PRO 1200 VANGUARD WIRING DIAGRAM

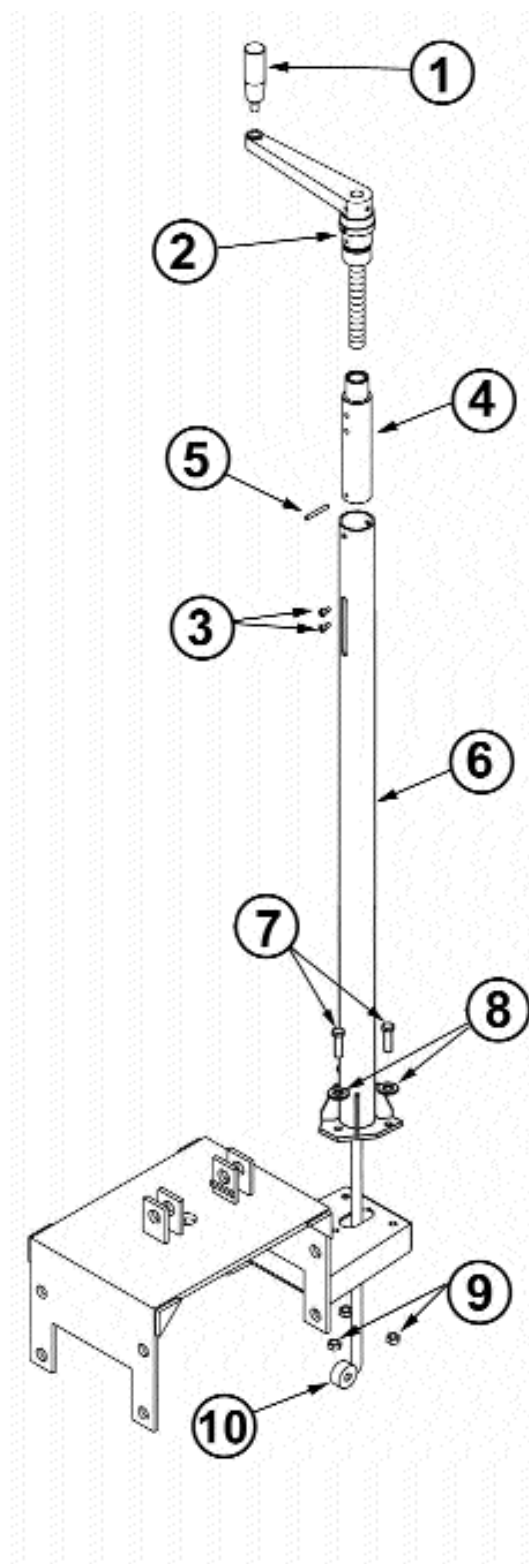


VANGUARD CONTROL PANEL ASSEMBLY

2A PARTS



ILL.	PART#	DESCRIPTION	QTY.
1.	.034613	.LENS, GREEN	1
2.	.034612	.LENS, AMBER	1
3.	.034614	.LENS, RED	1
4.	.034611	.LIGHT	3
5.	.034610	.FIXTURE, LIGHT	3
6.	.036771	.DECAL, TEMP	1
7.	.036770	.DECAL, CHARGE	1
8.	.036772	.DECAL, OIL	1
9.	.032125	.SWITCH, ROCKER	1
10.	.034876	.DECAL, LIGHTS	1
11.	.039005	.PANEL, CONTROL VANGUARD	1
12.	.029473	.HOURMETER, TINY TACH	1
13.	.029928	.CABLE, CHOKE	1
14.	.038727	.SWITCH, VANGUARD KEY	1
15.	.032979	.RHMS, 10/32 X 3/4	2
16.	.010570	.NUT, HEX 10/32	2
17.	.032358	.STARWASHER, 10/32	2

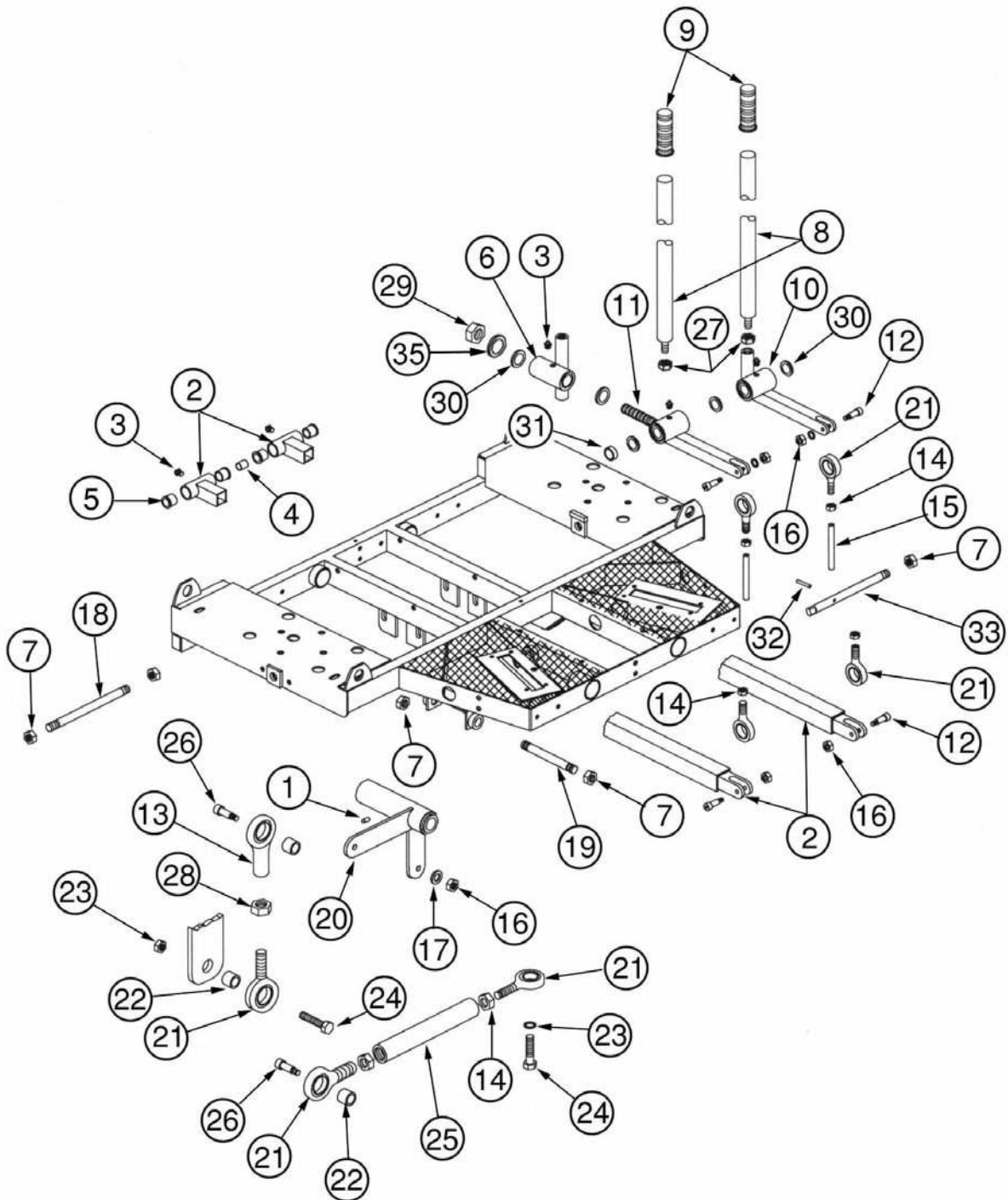


PITCH CONTROL ASSEMBLY (cont'd)**2A
PARTS**

ILL.	PART #	DESCRIPTION	QTY.
1.	.032115	KNOB, PITCH CONTROL	1
2.	.026541	CRANK HANDLE AND THREADED ROD	1
3.	.015768	SOCKET HEAD CAP SCREW 1/4-20 X 1/4	2
4.	.029812	BUSHING, SLIDE	1
5.	.015754	PIN, SPIRAL 3/16 X 1-1/2	1
6.	.026420	ASSEMBLY, TUBE AND PLATE	1
7.	.010036	BOLT, 3/8-16 X 1	3
8.	.017751	FW, HARDENED 3/8	3
9.	.020514	NUT, STOVER 3/8-16	3
10.	.029822	SHAFT	1

2A PARTS

STEERING LEVER ASSEMBLY

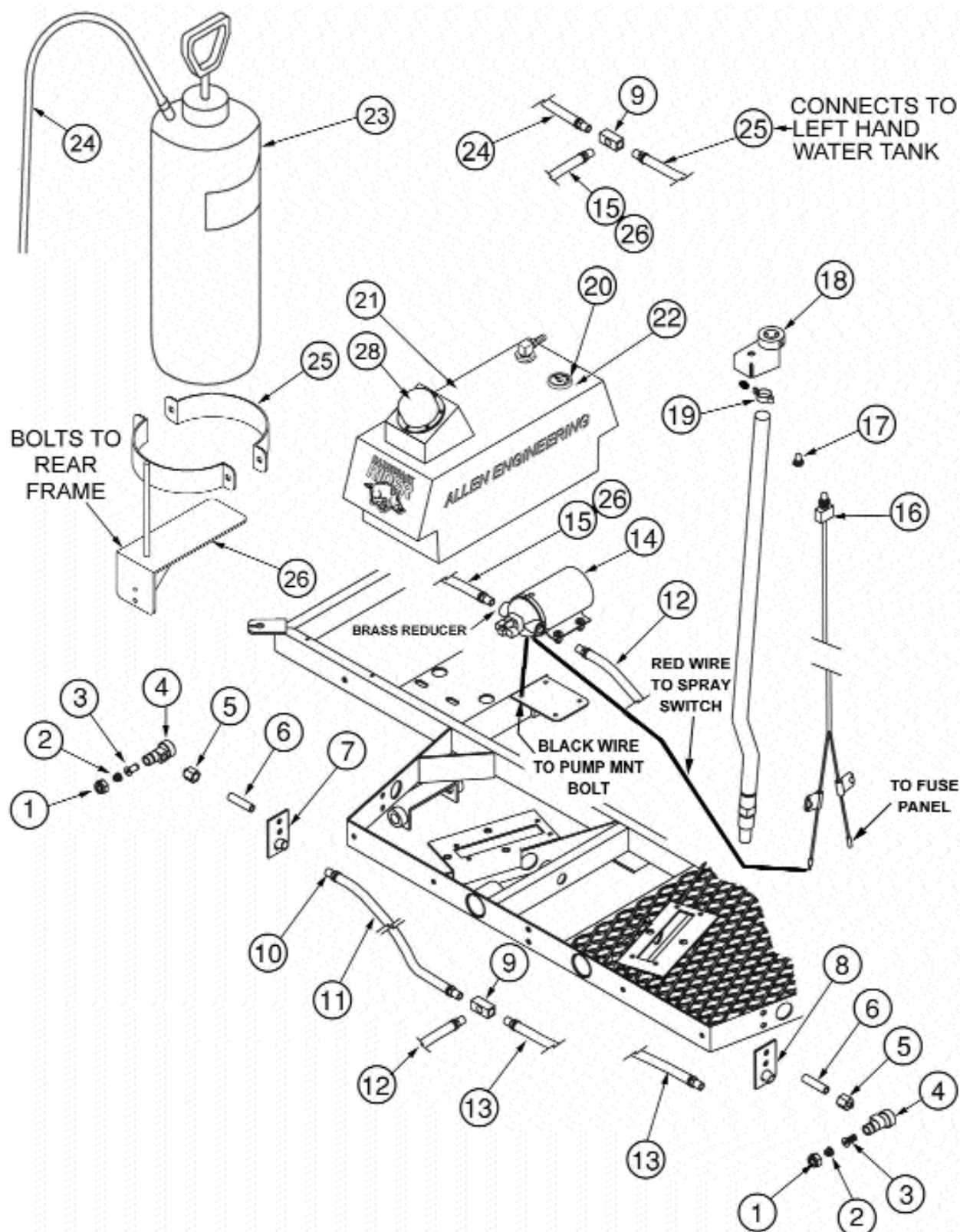


STEERING LEVER ASSEMBLY (cont'd)**2A
PARTS**

ILL.	PART #	DESCRIPTION	QTY.
1.	018510	GREASE FITTING 1/4-28 x 45 DEG.	1
2.	039190	SD LOWER CONTROL ARM	2
3.	201163	GREASE FITTING 1/8-27 NPT STRAIGHT	5
4.	026205	SPACER, CONTROL ARM	1
5.	024630	BUSHING, FLANGE	4
6.	037929	OPERATOR LEVER, LOWER	1
7.	026447	NUT, SELFLOCK 3/4-10 NC	6
8.	037931	OPERATOR LVR, UPPER	2
9.	037668	GRIP, HANDLE	2
10.	037926	OPERATOR LVR, LOWER LH	1
11.	034884	OPERATOR LVR, LOWER RH	1
12.	026267	BOLT, SHOULDER 1/2 x 1	4
13.	019900	ROD END, 1/2 FEMALE	5
14.	039678	NUT, JAM HEX 1/2-20	6
15.	026784	5" STEERING BAR	2
16.	010464	NUT, NYLON LOCK 3/8-16	6
17.	017751	LOCK WASHER (HDN) 3/8	2
18.	026234	SHAFT, CONTROL LEVER MTG.	1
19.	026272	SHAFT, FULCRUM ARM	1
20.	039585	FULCRUM ASSEMBLY	1
21.	221408	ROD END, 1/2 MALE	7
22.	026412	SPACER 5/16	2
23.	010093	LOCK WASHER 1/2	1
24.	010070	BOLT, 1/2-13 x 1-3/4	2
25.	026422	ARM, STEERING 14" (OL MACHINES)	1
	026791	ARM, STEERING 17" (NOL MACHINES)	1
26.	026268	BOLT, SHOULDER 1/2 x 1-3/4	2
28.	039678	NUT, JAM HEX 1/2-20	1
29.	026447	NUT, SELFLOCK 3/4-10 THIN	1
30.	034520	SPACER, BRONZE	5
31.	034444	COLLAR, SET 3/4	1
32.	018289	PIN, ROLL 3/16 X 1-1/4	1
33.	034442	BAR, STEERING	1
34.	026413	SPACER, 1/2	1
35.	034521	3/4' STEERING WASHER, FLAT	1

2A PARTS

SPRAY SYSTEM ASSEMBLY



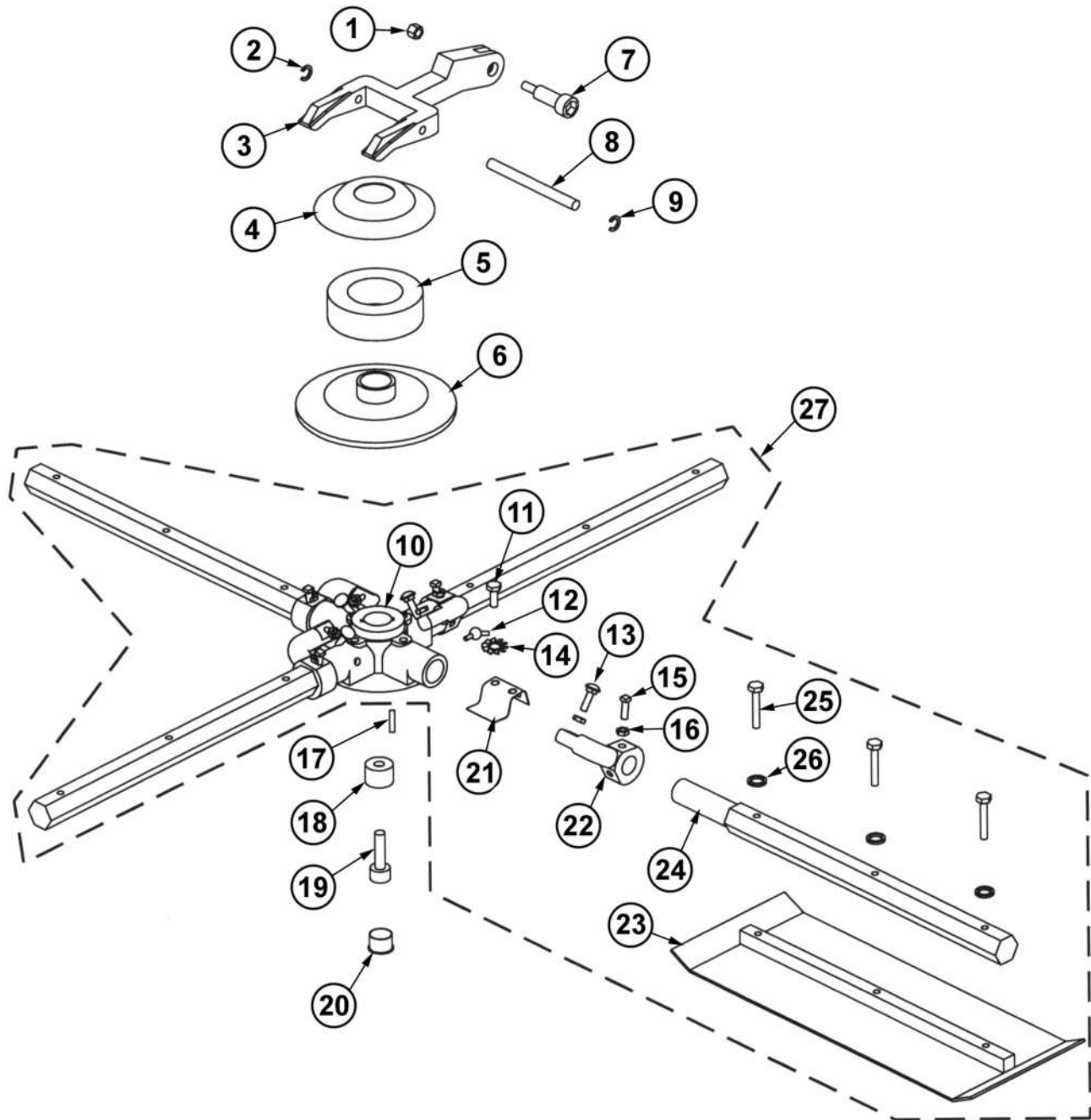
SPRAY SYSTEM ASSEMBLY (cont'd)

2A PARTS

ILL.	PART #	DESCRIPTION	QTY.
1.	012705	CAP, BRASS CP1325	2
2.	012702	TIP, SPRAY #8001 (FINE)	2
3.	012706	STRAINER, 5053100SS	2
4.	012704	VALVE, SPRAY RELIEF	2
5.	111001	FITTING, FATIGUE	2
6.	013499	NIPPLE, 1/4 x 2	2
7.	026930	BRACKET, SPRAY NOZZLE RIGHT HAND	1
8.	026931	BRACKET, SPRAY NOZZLE LEFT HAND	1
9.	036937	TEE, 1/4 BRASS (VANGUARD)	1
	036937	TEE, 1/4 BRASS (LINAMAR)	2
10.	010194	FITTING, MALE PUSHLOK (VANGUARD)	8
	010194	FITTING, MALE (LINAMAR)	12
11.	013392	HOSE, PUSHLOK 3/8	AS REQ.
12.	013392	HOSE, PUSHLOK 3/8	AS REQ.
13.	013392	HOSE, PUSHLOK 3/8	AS REQ.
14.	033735	PUMP, F/ SPRAY SYSTEM	1
15.	013392	HOSE, PUSHLOK 3/8 (VANGUARD)	AS REQ.
16.	037485	HARNESS WIRE F/ SPRAY SYSTEM	1
17.	037480	BOOT, TOGGLE	1
18.	037483	SWITCH MOUNT ASSEMBLY	1
19.	037681	CLAMP, WIRE F/ SPRAY SYSTEM	4
20.	036782	GAUGE, WATER SPRAY TANK	1
21.	039355	TANK W/ CAP (VANGUARD ONLY)	1
22.	034111	GASKET, F/ GAUGE	1
23.	034984	TANK, WATER (LINAMAR)	2
24.	013392	HOSE, PUSHLOK 3/8 (LINAMAR)	AS REQ.
25.	013392	HOSE, PUSHLOK 3/8 (LINAMAR)	AS REQ.
26.	013392	HOSE, PUSHLOK 3/8 (LINAMAR)	AS REQ.
27.	013557	BUSHING, 3/8 X 1/4 BRASS HEX (REDUCER)	2
28.	039278B	CAP, BLUE WATER FILTER ASSY (NOT SHOWN)	1

2A PARTS

SPIDER ASSEMBLY

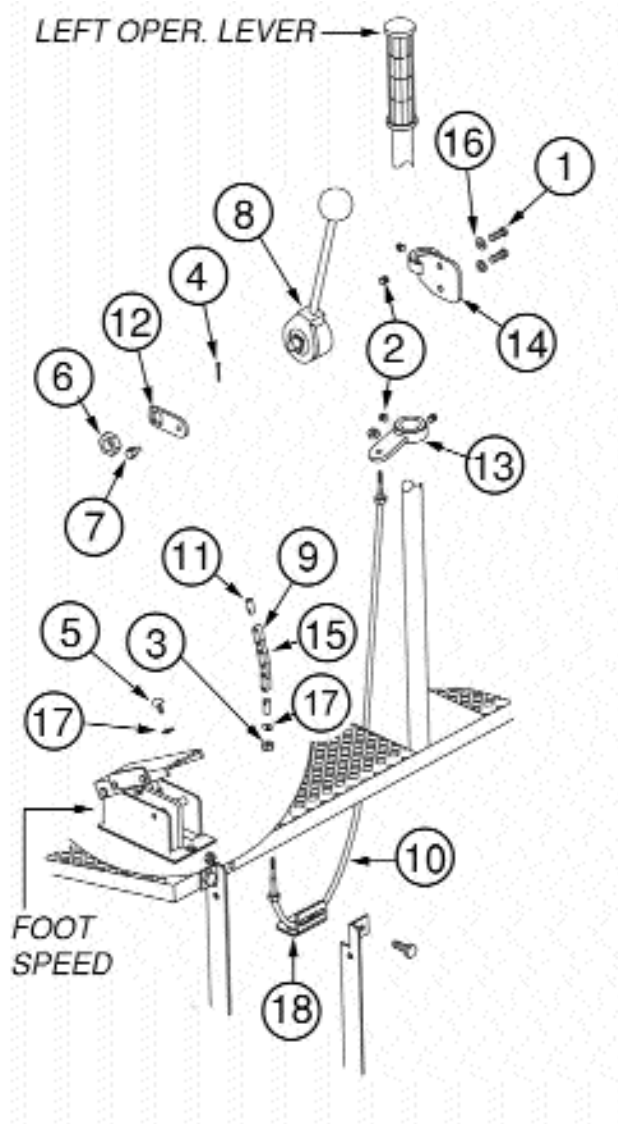


SPIDER ASSEMBLY (cont'd)

2A PARTS

ILL.	PART #	DESCRIPTION	QTY.
1.	.012612	NUT, HEX SELFLOCK 5/16-18	1
2.	.015677	E-RING RETAINER	1
3.	.026215	ARM, YOKE	1
4.	.015821	PRESSURE PLATE CAP	1
5.	.015822	BEARING, THRUST	1
6.	.015824	PLATE, PRESSURE	1
7.	.026504	BOLT, SHOULDER 3/8 x 1-1/4 W/ 5/16-18 THDS	1
8.	.015678	PIN, YOKE ARM RETAINER 7/16 x 7-3/8	1
9.	.015677	E-RING RETAINER (SAME AS ILL.# 2)	1
10.	.026943	BOSS F/ SPIDER RIGHT HAND	1
	.026942	BOSS F/ SPIDER LEFT HAND	1
11.	.015683	SCREW, DOG CAP 3/8-16 x 7/8	4
12.	.024755	GREASE FITTING 1/8-27 NPT 45°	4
	.015692	PLUG, PLASTIC CAP #GC-5 (NOT SHOWN)	4
13.	.012990	BOLT, CARRIAGE 3/8-18 x 1-1/4	4
14.	.015682	LOCK WASHER EXTERNAL STAR 3/8	4
15.	.015686	SET SCREW SQ. HEAD 3/8-16 x 1	4
16.	.015684	NUT, JAM 3/8-16	8
17.	.026227	KEY, 1/4 x 1/4 x 1-1/4	1
18.	.015690	WASHER RETAINING	1
19.	.015691	SCREW, SOCKET HEAD 1/2-13 x 1 1/2 LH	1
	.020155	SCREW, SOCKET HEAD 1/2-13 x 1 1/2 RH	1
20.	.015693	PLUG, PLASTIC CAP EC-12	2
21.	.016920	CLIP, SPRING UNIVERSAL	4
22.	.033034	LEVER, LIFT UNIVERSAL SD	4
23.	.015695A	BLADE, 6 x 18 FINISH	4
24.	.026944	ARM, SPIDER	4
25.	.010024	BOLT, 5/16-18 x 2 GR. 5	12
26.	.010090	LOCK WASHER 5/16	12
27.	.026230	SPIDER ASSEMBLY F/ 1050 RIGHT HAND	1
	.026588	SPIDER ASSEMBLY F/ 1050 LEFT HAND	1
28.	.015688	SCREW 9/16-18 NF ADJUSTING / MAC	4
29.	.028003	STABILIZER RING (NOT SHOWN)	2
30.	.025091	STAB. RING SHOULDER BOLTS (NOT SHOWN)	8
31.	.025092	STAB. RING BRONZE BUSHING (NOT SHOWN)	8

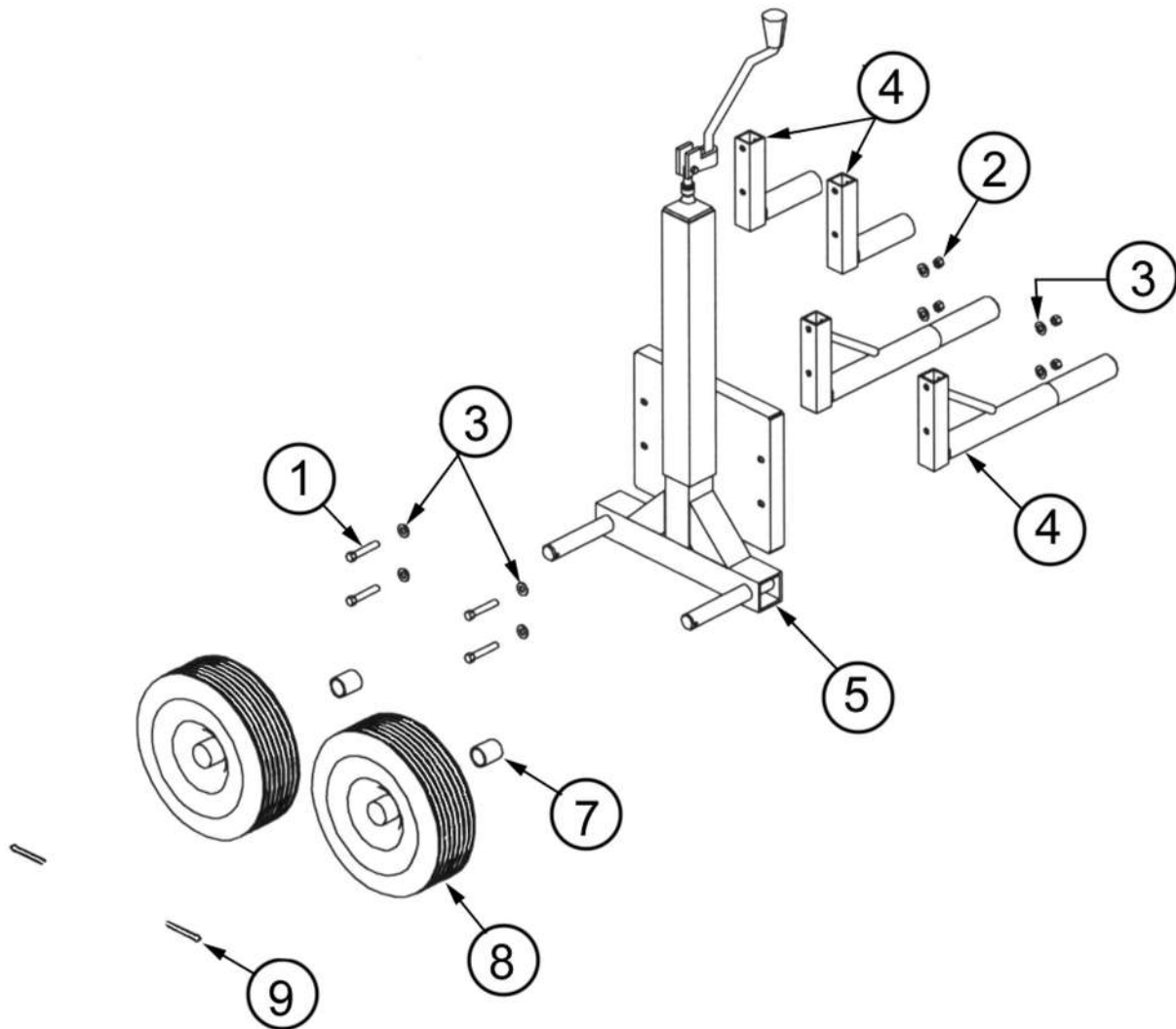
ACCESSORIES CRUISE CONTROL KIT PART# 028848



ILL.	PART#	DESCRIPTION	QTY.
1.	010018	BOLT, 5/16-18 x 1/2	2
2.	010313	SET SCREW 5/16-18 x 3/8	4
3.	010570	NUT, HEX 10-32	1
4.	010972	PIN, COTTER 3/16 x 1-1/2	1
5.	010382	SCREW, 10-32 x 1	1
6.	020688	NUT, JAM 5/8-18 RH	1
7.	024984	PIVOT, FOOT SPEED CONTROL	1
8.	028018	LOCK, POSITIVE PITCH	1
9.	028035	LINK, MASTER #35	2
10.	028243	THROTTLE, HD CABLE ASSEMBLY	1
11.	028842	END, CRUISE CONTROL CHAIN	1
12.	028844	SIDE BRACKET, CRUISE CONTROL	1
13.	028846	BRACKET, CRUISE CONTROL CABLE	1
14.	028847	BRACKET, CRUISE CONTROL LEVER	1
15.	028881	CHAIN, CRUISE CONTROL	1
16.	032337	WASHER, STAR INTERNAL 5/16	2
17.	032358	WASHER, STAR 10-32	2
18.	032356	BRACKET, PEDAL END CRUISE CONTROL CABLE	1

ACCESSORIES (cont'd)
PRO DOLLY JACK SYSTEM -- SET PART # 027684

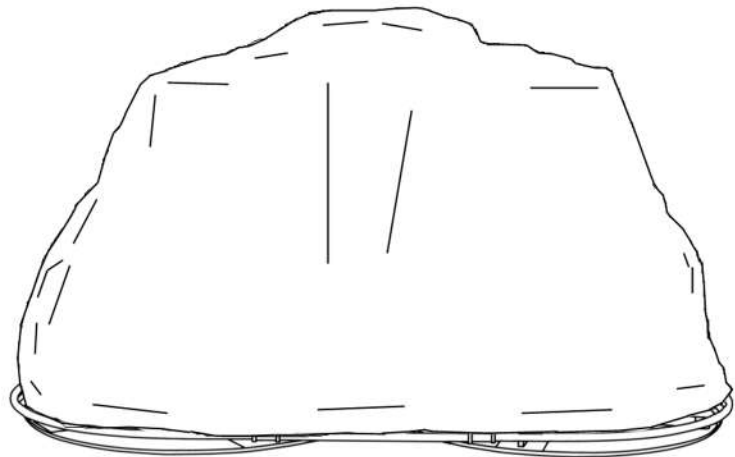
2A
PARTS



ILL.	PART#	DESCRIPTION	QTY.
1.	.010040	BOLT, 3/8-16 x 2	8
2.	.010464	NUT, NYLON LOCK 3/8-16	8
3.	.017751	FLAT WASHER 3/8	16
4.	.026729	DOLLY JACK MOUNTING TUBES (FRONT)	2
	.026728	DOLLY JACK MOUNTING TUBES (REAR)	2
5.	.026938	DOLLY JACK	2
7.	.024628	WHEEL SPACER	8
8.	.099014	TIRES	4
9.	.013759	PIN, COTTER 3/16 x 2-1/2	8
10.	.026899	DOLLY JACK, FRONT ASSEMBLY	1
11.	.026900	DOLLY JACK, REAR ASSEMBLY	1

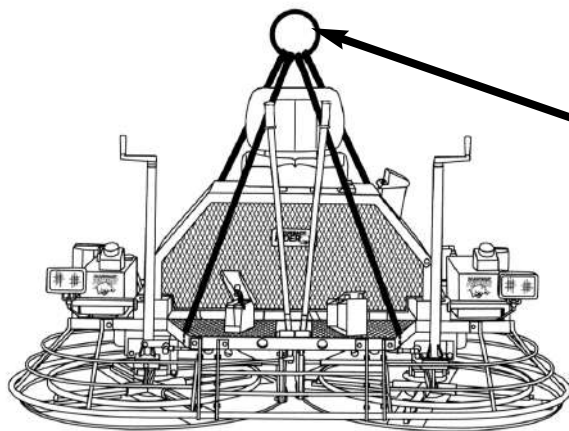
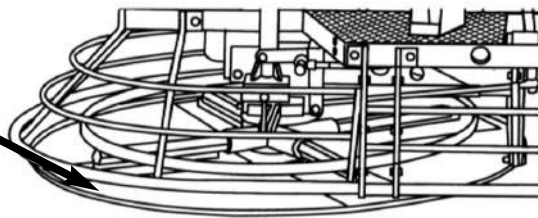
**PRO 1200
RIDING
TROWEL
VINYL COVER**

PART #: 026595



**1200
FLOATING
DISCS (PANS)**

**PART #: 026912-2
(SET OF TWO)**

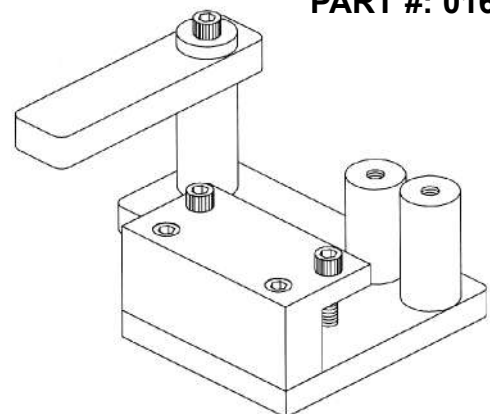


**LIFTING
BRIDLE
(SLING TYPE)**

PART #: 035461

**TROWEL ARM
ALIGNMENT JIG**

PART #: 016863



**SPIDER
PULLER
ASSEMBLY**

PART #: 035688

