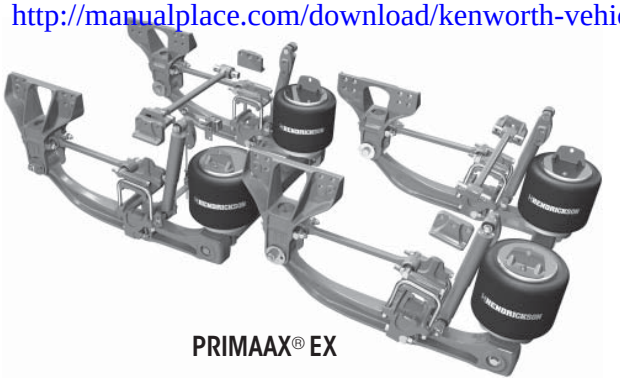


PRIMAAX® EX

TECHNICAL PROCEDURE

PRIMAAX® EX • PRIMAAX® for Kenworth Vehicles

SUBJECT: Service Instructions
LIT NO: 17730-263
DATE: March 2012 **REVISION:** C

TABLE OF CONTENTS

HENDRICKSON
The World Rides On Us®

SECTION 1
Introduction

This publication is intended to acquaint and assist maintenance personnel in the preventive maintenance, service, repair, and rebuild of the PRIMAAX® EX • PRIMAAX® suspension systems as installed on applicable Kenworth Vehicles.

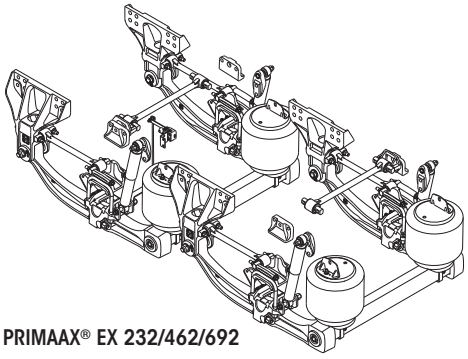
NOTE Use only Hendrickson Genuine parts for servicing this suspension system.

It is important to read and understand the entire Technical Procedure publication prior to performing any maintenance, service, repair, or rebuild of this product. The information in this publication contains parts lists, safety information, product specifications, features, proper maintenance, service, repair and rebuild instructions for the PRIMAAX EX • PRIMAAX suspensions.

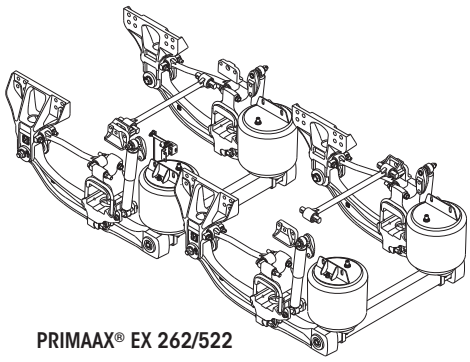
Hendrickson reserves the right to make changes and improvements to its products and publications at any time. Contact Hendrickson Tech Services for information on the latest version of this manual at 1-866-755-5968 (toll-free U.S. and Canada), 630-910-2800 (outside U.S. and Canada) or e-mail: techservices@hendrickson-intl.com.

The latest revision of this publication is also available online at www.hendrickson-intl.com.

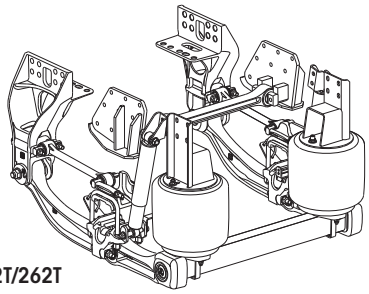
SECTION 2
Product Description



PRIMAAX® EX 232/462/692



PRIMAAX® EX 262/522



PRIMAAX® EX 232T/262T

PRIMAAX EX — MAAXimize the performance of vocational, and heavy-haul and severe service vehicles with a suspension engineered specifically for demanding on- and off- road conditions including, but not limited to: truck, tractor, dump, front and rear discharge mixer, crane, refuse, drilling rig, logging, platform, specialty and vehicles equipped with outriggers*. With more than 95 years of robust suspension design, Hendrickson delivers another premium suspension with PRIMAAX EX. Rugged, dependable and extensively tested in challenging applications, PRIMAAX EX paves a new road for suspension technology.

* Some vehicle configurations, such as vehicles equipped with outriggers, may require alternate suspension air valving. Contact vehicle manufacturer or Hendrickson for more information.

- **Support beams and cross tube** — Structural beams include integrated end caps that form a solid connection with the square cross tube to form a rigid torsion system for improved stability and control.
- **Unique suspension geometry** — Optimized suspension geometry contributes to more than twice the roll stability of competitive air suspensions, helps improve handling and roll stiffness for expanded applications, and significantly controls suspension-induced driveline vibration.
- **Large volume air springs** — Reduce noise, vibration and harshness to cab, chassis and body equipment for reduced total vehicle maintenance. Also reduce air pressure required to lift and support loads.
- **QUIK-ALIGN®** — Hendrickson's proven QUIK-ALIGN axle alignment system helps save time and money – offers a fast method to ensure proper alignment to reduce maintenance time and help extend tire life.
- **D-Pin axle connection and clamp group** — Reduces stress input into the axle housing by transferring the torsional loads to the integrated stabilizer system, which helps extend axle and joint service life.
- **Heavy-duty shock absorbers** — Positioned and tuned for optimum damping characteristics and also protect air springs from overextension.
- **Premium torque rods and bushings** — The three-rod configuration reduces axle stress, welding and complexity. Optimized configuration contributes to exceptional handling.

PRIMAAX EX SPECIFICATIONS

	PAX EX 232	PAX EX 232T	PAX EX 262	PAX EX 262T	PAX EX 262S	PAX EX 462	PAX EX 522	PAX EX 522S	PAX EX 692
Rating (in lbs.)	23,000	23,000	26,000	26,000	26,000	46,000	52,000	52,000	69,000
Installed Weight[1] (in lbs.)	539	668	652	679	565	1,078	1,292	1,130	1,629
Axle Configuration	Single	Single	Single	Single	Single	Tandem	Tandem	Tandem	Tridem
GCW Approval[2] (in lbs.)	95,000	95,000	142,000	142,000	142,000	180,000	245,000	*	*
Site Travel Rating[3] (in lbs.)	30,000	30,000	33,000	33,000	33,000	60,000	66,000	66,000	90,000
Axle Travel[4]	8"	8"	7"	8"	7"	8"	8"	8"	8"
Ground Clearance[5]	10.75"	10.75"	9.0"	10.5"	9.0"	10.75"	10.5"	10.75"	10.75"
Lift Axles	Approved	Approved	Approved	Approved	Approved	Approved	Approved	Approved	Approved
Ride Heights[6]	10"	15.5"	10"	15.5"	8.5"	10"	10"	10"	10"
Engine Torque Restrictions	None	None	None	None	None	None	None	None	None
Axle Spacing	N/A	N/A	N/A	N/A	N/A	52"- 72.5"	54"- 72.5"	52"- 72.5"	52"- 60"

* See Axle manufacturer recommendation.

1. Installed weight includes complete suspension, torque rods, axle and frame brackets and all hardware. Published weight is based on a standard PRIMAAX EX suspension compatible with drum brakes using 10.0 inch ride height. Other configurations may vary.
2. Contact Hendrickson or original equipment manufacturer for applications that may exceed GVW / GCW approval ratings.
3. Site travel rating — operators using vehicles equipped with liftable push or tag axles must not exceed published ratings. Ratings are limited to no more than five percent of vehicle operation at a speed not to exceed five mph. Liftable pusher or tag axles should be raised (or unloaded) to improve vehicle maneuverability in off-road use or when vehicle is empty. Site travel ratings are consistent with specifications and must not be exceeded.
4. Axle travel may be limited by vehicle manufacturer; axle stop settings and shock absorber stroke may restrict suspension's articulation. Varying ride heights and configurations may restrict travel.
5. Ground clearance is based on a standard PRIMAAX EX suspension with 11R22.5 tire size (19.6" SLR).
6. For different ride height options, please contact Hendrickson, your truck manufacturer or dealer for further information.

U.S. and foreign patents pending.

SECTION 3

Important Safety Notice

Proper maintenance, service and repair are important to the reliable operation of the suspension. The procedures recommended by Hendrickson and described in this technical publication are methods of performing such maintenance, service and repair.

The warnings and cautions should be read carefully to help prevent personal injury and to assure that proper methods are used. Improper maintenance, service or repair may damage the vehicle, cause personal injury, render the vehicle unsafe in operation, or void the manufacturer's warranty.

Failure to follow the safety precautions in this manual can result in personal injury and/or property damage. Carefully read and understand all safety related information within this publication, on all decals and in all such materials provided by the vehicle manufacturer before conducting any maintenance, service or repair.

EXPLANATION OF SIGNAL WORDS

Hazard "Signal Words" (Danger • Warning • Caution) appear in various locations throughout this publication. Information accented by one of these signal words must be observed to help minimize the risk of personal injury to service personnel, or possibility of improper service methods which may damage the vehicle or render it unsafe.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Additional Notes or Service Hints are utilized to emphasize areas of procedural importance and provide suggestions for ease of repair. The following definitions indicate the use of these signal words as they appear throughout the publication.

DANGER — INDICATES AN IMMINENTLY HAZARDOUS SITUATION, WHICH IF NOT AVOIDED, WILL RESULT IN SERIOUS INJURY OR DEATH.

WARNING — INDICATES A POTENTIAL HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, CAN RESULT IN SERIOUS INJURY OR DEATH.

CAUTION — INDICATES A POTENTIAL HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN MINOR OR MODERATE INJURY.

NOTE — An operating procedure, practice condition, etc. which is essential to emphasize.

SERVICE HINT — A helpful suggestion that will make the servicing being performed a little easier and/or faster.

Also note that particular service operations may require the use of special tools designed for specific purposes. These special tools can be found in the "Special Tools" Section of this publication.

The torque symbol alerts you to tighten fasteners to a specified torque value. Refer to Torque Specifications Section of this publication.

SAFETY PRECAUTIONS

WARNING

FASTENERS

DISCARD USED FASTENERS. ALWAYS USE NEW FASTENERS TO COMPLETE A REPAIR. FAILURE TO DO SO COULD RESULT IN FAILURE OF THE PART, OR MATING COMPONENTS, LOSS OF VEHICLE CONTROL, PERSONAL INJURY, OR PROPERTY DAMAGE.

LOOSE OR OVER TORQUED FASTENERS CAN CAUSE COMPONENT DAMAGE, LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE, OR SEVERE PERSONAL INJURY. MAINTAIN CORRECT TORQUE VALUE AT ALL TIMES. CHECK TORQUE VALUES ON A REGULAR BASIS AS SPECIFIED, USING A REGULARLY CALIBRATED TORQUE WRENCH THAT IS REGULARLY CALIBRATED. TORQUE VALUES SPECIFIED IN THIS TECHNICAL PUBLICATION ARE FOR HENDRICKSON SUPPLIED FASTENERS ONLY. IF NON HENDRICKSON FASTENERS ARE USED, FOLLOW TORQUE SPECIFICATION LISTED IN THE VEHICLE MANUFACTURER'S SERVICE MANUAL.

WARNING

QUIK-ALIGN FASTENERS

DISCARD USED QUIK-ALIGN FASTENERS. ALWAYS USE NEW QUIK-ALIGN FASTENERS TO COMPLETE A REPAIR. FAILURE TO DO SO COULD RESULT IN FAILURE OF THE PART, OR MATING COMPONENTS, LOSS OF VEHICLE CONTROL, PERSONAL INJURY, OR PROPERTY DAMAGE.

DO NOT ASSEMBLE QUIK-ALIGN JOINT WITHOUT THE PROPER FASTENERS. USE ONLY H-COATED FASTENERS TO SUSTAIN PROPER CLAMP FORCE. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL, PROPERTY DAMAGE OR PERSONAL INJURY AND VOID WARRANTY. ENSURE THAT THE QUIK-ALIGN FASTENER'S TORQUE VALUES ARE SUSTAINED AS RECOMMENDED IN THE TORQUE SPECIFICATIONS SECTION OF THIS PUBLICATION. FAILURE TO DO SO CAN CAUSE LOSS OF VEHICLE CONTROL RESULTING IN PERSONAL INJURY OR PROPERTY DAMAGE.

WARNING

LOAD CAPACITY

ADHERE TO THE PUBLISHED CAPACITY RATINGS FOR THE SUSPENSION. ADD-ON AXLE ATTACHMENTS AND OTHER LOAD TRANSFERRING DEVICES, SUCH AS LIFTABLE AXLES, CAN INCREASE THE SUSPENSION LOAD ABOVE ITS RATED AND APPROVED CAPACITIES, WHICH CAN RESULT IN COMPONENT DAMAGE AND LOSS OF VEHICLE CONTROL, POSSIBLY CAUSING PERSONAL INJURY OR PROPERTY DAMAGE.

WARNING

MODIFYING COMPONENTS

DO NOT MODIFY OR REWORK PARTS WITHOUT AUTHORIZATION FROM HENDRICKSON. DO NOT SUBSTITUTE REPLACEMENT COMPONENTS NOT AUTHORIZED BY HENDRICKSON. USE OF MODIFIED, REWORKED, SUBSTITUTE OR REPLACEMENT PARTS NOT AUTHORIZED BY HENDRICKSON MAY NOT MEET HENDRICKSON'S SPECIFICATIONS, AND CAN RESULT IN FAILURE OF THE PART, LOSS OF VEHICLE CONTROL, POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE, AND WILL VOID WARRANTY. USE ONLY HENDRICKSON AUTHORIZED REPLACEMENT PARTS.

WARNING

TORCH/WELDING

DO NOT USE A CUTTING TORCH TO REMOVE ANY FASTENERS. THE USE OF HEAT ON SUSPENSION COMPONENTS WILL ADVERSELY AFFECT THE STRENGTH OF THESE PARTS. A COMPONENT DAMAGED IN THIS MANNER CAN RESULT IN THE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE. EXERCISE EXTREME CARE WHEN HANDLING OR PERFORMING MAINTENANCE IN THE AREA OF THE SUPPORT BEAM. DO NOT CONNECT ARC WELDING GROUND LINE TO THE SUPPORT BEAM. DO NOT STRIKE AN ARC WITH THE ELECTRODE ON THE SUPPORT BEAM. DO NOT USE HEAT NEAR THE SUPPORT BEAM ASSEMBLY. DO NOT NICK OR GOUGE THE SUPPORT BEAM. SUCH IMPROPER ACTIONS CAN DAMAGE THE SUPPORT BEAM ASSEMBLY AND CAUSE LOSS OF VEHICLE CONTROL AND POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.

WARNING

SHOCK ABSORBERS

THE SHOCK ABSORBERS ARE THE REBOUND TRAVEL STOPS FOR THE SUSPENSION. ANYTIME THE AXLE ON A PRIMAAX EX • PRIMAAX SUSPENSION IS SUSPENDED IT IS MANDATORY THAT THE SHOCK ABSORBERS REMAIN CONNECTED. FAILURE TO DO SO CAN CAUSE THE AIR SPRINGS TO SEPARATE FROM THE PISTON AND RESULT IN PREMATURE AIR SPRING FAILURE. REPLACEMENT OF SHOCK ABSORBERS WITH NON-HENDRICKSON PARTS CAN ALTER THE REBOUND TRAVEL OF THE SUSPENSION.

WARNING

AIR SPRING INFLATION AND DEFLATION

PRIOR TO DISASSEMBLY OF THE SUSPENSION, AIR SPRING ASSEMBLIES MUST BE DEFLATED. UNRESTRICTED AIR SPRING ASSEMBLIES CAN VIOLENTLY SHIFT. DO NOT INFLATE AIR SPRING ASSEMBLIES WHEN THEY ARE UNRESTRICTED. AIR SPRING ASSEMBLIES MUST BE RESTRICTED BY SUSPENSION OR OTHER ADEQUATE STRUCTURE. DO NOT INFLATE BEYOND PRESSURES RECOMMENDED BY AIR SPRING MANUFACTURER, CONTACT HENDRICKSON TECHNICAL SERVICES FOR DETAILS. IMPROPER USE OR OVER INFLATION MAY CAUSE AIR SPRING ASSEMBLIES TO BURST, CAUSING PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

WARNING

PRIOR TO AND DURING DEFLATION AND INFLATION OF THE AIR SUSPENSION SYSTEM, ENSURE ALL PERSONNEL AND EQUIPMENT ARE CLEAR FROM UNDER THE VEHICLE AND AROUND THE SERVICE AREA, FAILURE TO DO SO CAN CAUSE SERIOUS PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE.

CAUTION

AIR SPRING INFLATION

INFLATE THE SUSPENSION SLOWLY AND MAKE SURE THE RUBBER BLADDER OF THE AIR SPRING INFLATES UNIFORMLY AND IS NOT BINDING. FAILURE TO DO SO CAN CAUSE DAMAGE TO THE AIR SPRING AND/OR MOUNTING BRACKETS AND VOID WARRANTY.

CAUTION

AIR SPRING LOWER MOUNTING STUDS

IF THE AIR SPRING IS BEING REMOVED, IT IS MANDATORY TO LUBRICATE THE LOWER AIR SPRING FASTENERS WITH PENETRATING OIL AND REMOVE WITH HAND TOOLS TO PREVENT DAMAGE TO THE LOWER AIR SPRING MOUNTING STUD. FAILURE TO DO SO CAN CAUSE COMPONENT DAMAGE AND VOID WARRANTY.

WARNING

AIR SPRING PRESSURE RETENTION

SOME VEHICLE APPLICATIONS, SUCH AS VEHICLES EQUIPPED WITH OUTRIGGERS, RETAIN SOME AIR PRESSURE IN THE AIR SPRINGS AT ALL TIMES. PRIOR TO PERFORMING ANY MAINTENANCE, SERVICE, OR REPAIR OF THE SUSPENSION, VERIFY EACH AIR SPRING IS COMPLETELY DEFLATED. FAILURE TO DO SO COULD RESULT SERIOUS PROPERTY DAMAGE AND/OR SEVERE PERSONAL INJURY.

WARNING

FAILURE TO PRESS THE AIR SPRING AGAINST THE UNDERSIDE OF THE FRAME WHILE TIGHTENING THE UPPER AIR SPRING BRACKET CAN RESULT IN COMPONENT DAMAGE AND PERSONAL INJURY OR PROPERTY DAMAGE.

CAUTION

PROCEDURES AND TOOLS

A TECHNICIAN USING A SERVICE PROCEDURE OR TOOL WHICH HAS NOT BEEN RECOMMENDED BY HENDRICKSON MUST FIRST SATISFY HIMSELF THAT NEITHER HIS SAFETY NOR THE VEHICLE'S SAFETY WILL BE JEOPARDIZED BY THE METHOD OR TOOL SELECTED. INDIVIDUALS DEVIATING IN ANY MANNER FROM THE INSTRUCTIONS PROVIDED WILL ASSUME ALL RISKS OF CONSEQUENTIAL PERSONAL INJURY OR DAMAGE TO EQUIPMENT INVOLVED.

WARNING

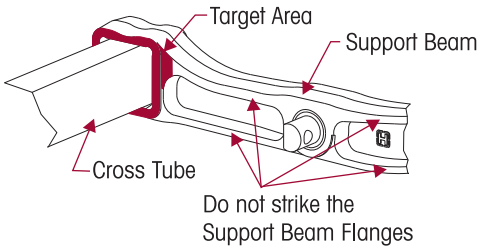
TRANSVERSE RODS

THE PRIMAAX EX / PRIMAAX SUSPENSIONS INCORPORATES TRANSVERSE RODS FOR VEHICLE STABILITY. IF THESE COMPONENTS ARE DISCONNECTED OR ARE NON-FUNCTIONAL THE VEHICLE SHOULD NOT BE OPERATED. FAILURE TO DO SO CAN RESULT IN ADVERSE VEHICLE HANDLING AND POSSIBLE TIRE CONTACT WITH THE FRAME. OPERATING A VEHICLE WITH NON-FUNCTIONAL TRANSVERSE TORQUE RODS CAN RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY, AND PREMATURE COMPONENT DAMAGE.

⚠ WARNING

CROSS TUBE, SUPPORT BEAM AND U-BEAM ASSEMBLY

FIGURE 3-1



PROTECT THE CROSS TUBE BY PLACING A PIECE OF PLYWOOD AGAINST OR CARDBOARD AROUND THE CROSS TUBE PRIOR TO APPLYING BLUNT FORCE TO PREVENT DAMAGE TO THE CROSS TUBE. CAREFULLY DISLODGE THE CROSS TUBE FROM THE SUPPORT BEAM WITH A LONG HANDLED SLEDGE HAMMER APPLYING BLUNT FORCE ON THE SUPPORT BEAM DIRECTLY IN FRONT THE INBOARD TOP CORNER JOINT. ALL BLUNT FORCE MUST BE APPLIED FLUSH TO THE THICKEST PART OF THE SUPPORT BEAM. FAILURE TO STRIKE THE SUPPORT BEAM SQUARELY MAY RESULT IN COMPONENT DAMAGE, PREMATURE FAILURE AND VOID WARRANTY, SEE FIGURE 3-1.

⚠ WARNING

CROSS TUBE

IMPROPER JACKING METHODS CAN CAUSE STRUCTURAL DAMAGE (SEE SAFETY DECAL, FIGURE 3-2) AND RESULT IN LOSS OF VEHICLE CONTROL, SEVERE PERSONAL INJURY OR DEATH AND WILL VOID HENDRICKSON'S WARRANTY.

FIGURE 3-2 Label number 60905-015

REPLACE ANY SAFETY DECALS THAT ARE FADED, TORN, MISSING, ILLEGIBLE, OR OTHERWISE DAMAGED. CONTACT HENDRICKSON TO ORDER REPLACEMENT LABELS.

- DO NOT USE THE SUSPENSION CROSS TUBE AS A JACKING POINT, SEE FIGURE 3-3.
- REFER TO VEHICLE MANUFACTURER FOR PROPER JACKING INSTRUCTIONS, SEE FIGURE 3-4.

FIGURE 3-3

FIGURE 3-4

⚠ WARNING

PERSONAL PROTECTIVE EQUIPMENT

ALWAYS WEAR PROPER EYE PROTECTION AND OTHER REQUIRED PERSONAL PROTECTIVE EQUIPMENT TO HELP PREVENT PERSONAL INJURY WHEN PERFORMING VEHICLE MAINTENANCE, REPAIR OR SERVICE.

⚠ WARNING

WORK SITE DUMPING

WHEN THE TRUCK/TRAILER BODY/BOOM/AND OR ATTACHMENT IS LIFTED IT IS MANDATORY TO COMPLETELY EXHAUST THE AIR FROM THE REAR SUSPENSION SYSTEM TO HELP PROVIDE STABILITY WHEN LIFTED. FAILURE TO DO SO CAN RESULT IN LOSS OF VEHICLE CONTROL, ROLL-OVER, OR VEHICLE INSTABILITY, POSSIBLY CAUSING SEVERE PERSONAL INJURY, PROPERTY DAMAGE, OR DEATH. FIRST RAISE ANY AUXILIARY AXLES AND THEN EXHAUST ALL PRESSURE FROM REAR TRACTOR / TRAILER AND TRUCK AIR SUSPENSION SYSTEMS PRIOR TO RAISING THE BODY / BOOM OR ATTACHMENTS. FOLLOW THE VEHICLE MANUFACTURER'S OPERATING INSTRUCTIONS FOR MAINTAINING PROPER STABILITY.

⚠ CAUTION

PROCEDURES AND TOOLS

A TECHNICIAN USING A SERVICE PROCEDURE OR TOOL WHICH HAS NOT BEEN RECOMMENDED BY HENDRICKSON MUST FIRST SATISFY HIMSELF THAT NEITHER HIS SAFETY NOR THE VEHICLE'S SAFETY WILL BE JEOPARDIZED BY THE METHOD OR TOOL SELECTED. INDIVIDUALS DEVIATING IN ANY MANNER FROM THE INSTRUCTIONS PROVIDED WILL ASSUME ALL RISKS OF CONSEQUENTIAL PERSONAL INJURY OR DAMAGE TO EQUIPMENT INVOLVED.

⚠ WARNING

PARTS CLEANING

SOLVENT CLEANERS CAN BE FLAMMABLE, POISONOUS, AND CAUSE BURNS. TO HELP AVOID SERIOUS PERSONAL INJURY, CAREFULLY FOLLOW THE MANUFACTURER'S PRODUCT INSTRUCTIONS AND GUIDELINES AND THE FOLLOWING PROCEDURES:

1. WEAR PROPER EYE PROTECTION.
2. WEAR CLOTHING THAT PROTECTS YOUR SKIN.
3. WORK IN A WELL-VENTILATED AREA.
4. DO NOT USE GASOLINE OR SOLVENTS THAT CONTAIN GASOLINE. GASOLINE CAN EXPLODE.
5. HOT SOLUTION TANKS OR ALKALINE SOLUTIONS MUST BE USED CORRECTLY. FOLLOW THE MANUFACTURER'S RECOMMENDED INSTRUCTIONS AND GUIDELINES CAREFULLY TO HELP PREVENT PERSONAL ACCIDENT OR INJURY.

DO NOT USE HOT SOLUTION TANKS OR WATER AND ALKALINE SOLUTIONS TO CLEAN GROUND OR POLISHED PARTS. DOING SO WILL CAUSE DAMAGE TO THE PARTS AND VOID WARRANTY.