An Oshkosh Corporation Company

Operation and Safety Manual

Models

1532E3
1932E3
2033E3
2046E3
2646E3
2658E3

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July 23, 2012

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An Oshkosh Corporation Company

FOREWORD

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

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

ALL INSTRUCTIONS IN THIS MANUAL ARE BASED ON THE USE OF THE MACHINE UNDER PROPER OPERATING CONDITIONS, WITH NO DEVIATIONS FROM THE ORIGINAL DESIGN. ALTERATION AND/OR MODIFICATION OF THE MACHINE IS STRICTLY FORBIDDEN, WITHOUT WRITTEN APPROVAL FROM JLG INDUSTRIES, PER OSHA REGULATIONS AND APPLICABLE ANSI STANDARDS.

THIS SAFETY ALERT SYMBOL IS USED TO CALL ATTENTION TO POTENTIAL HAZARDS WHICH MAY LEAD TO SERIOUS INJURY OR DEATH IF IGNORED.

Safety of personnel and proper use of the machine are of primary concern, DANGER, WARNING, CAUTION, IMPORTANT, INSTRUCTIONS and **NOTE** are inserted throughout this manual to emphasize these areas. They are defined as follows:

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

CAUTION INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, MAY RESULT IN MINOR OR MODERATE INJURY. IT MAY ALSO BE USED TO ALERT AGAINST UNSAFE PRACTICES

⚠ IMPORTANT

IMPORTANT OR INSTRUCTIONS INDICATES A PROCEDURES ESSENTIAL FOR SAFE OPERATION AND WHICH, IF NOT FOLLOWED, MAY RESULT IN A MALFUNCTION OR DAMAGE TO THE MACHINE.

⚠ IMPORTANT

JLG INDUSTRIES MAY HAVE ISSUED SAFETY RELATED BULLETINS FOR YOUR JLG PRODUCT. CONTACT JLG INDUSTRIES INC. OR THE LOCAL AUTHORIZED JLG DISTRIBUTOR FOR INFORMATION CONCERNING SAFETY RELATED BULLETINS WHICH MAY HAVE BEEN ISSUED FOR YOUR JLG PRODUCT. ALL ITEMS REQUIRED BY THE SAFETY RELATED BULLETINS MUST BE COMPLETED ON THE AFFECTED JLG PRODUCT

Due to continuous product improvements, JLG Industries, Inc. reserves the right to make specification changes without prior notification. Contact JLG Industries, Inc. for updated information.

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

READ & HEED!

The ownership, use, service, and/or maintenance of this machine is subject to various governmental and local laws and regulations. It is the responsibility of the owner/user to be knowledgeable of these laws and regulations and to comply with them. The most prevalent regulations of this type in the United States are the Federal OSHA Safety Regulations*. Listed below, in abbreviated form are some of the requirements of Federal OSHA regulations in effect as of the date of publication of this handbook.

The listing of these requirements shall not relieve the owner/user of the responsibility and obligation to determine all applicable laws and regulations and their exact wording and requirements, and to comply with the requirements. Nor shall the listing of these requirements constitute an assumption of responsibility of liability on the part of JLG Industries, Inc.

1. Only trained and authorized operators shall be permitted to operate the aerial lift.
2. A malfunctioning lift shall be shut down until repaired.
3. The controls shall be plainly marked as to their function.
4. The controls shall be tested each day prior to use to determine that they are in safe operating condition.
5. All personnel in the platform shall, at all times, wear approved fall protection devices and other safety gear as required.
6. Load limits specified by the manufacturer shall not be exceeded.
7. Instruction and warning placards must be legible.
8. Aerial lifts may be field modified for uses other than those intended by the manufacturer only if certified in writing by the manufacturer to be in conformity to JLG requirements and to be at least as safe as it was prior to modification.
9. Aerial lifts shall not be used near electric power lines unless the lines have been de energized or adequate clearance is maintained.
10. Employees using aerial lifts shall be instructed on how to recognize and avoid unsafe conditions and hazards.
11. Ground controls shall not be operated unless permission has been obtained from personnel in the platform, except in case of an emergency.
12. Regular inspection of the job site and aerial lift shall be performed by competent persons.
13. Personnel shall always stand on the floor of the platform, not on boxes, planks, railing or other devices, for a work position.

*Applicable Federal OSHA regulations for the United States, as of the date of publication of this manual, include, but are not limited to, 29 CFR 1910.67, 29 CFR 1926.20, 29 CFR 1926.21, 29 CFR 1926.28, and 29 CFR 1926.453.

REVISON LOG

January 1999	-	Original Issue
March 12, 1999	-	Revised
March 1, 2001		Revised
July 31, 2001		Revised
July 23, 2012		Revised

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1.1 GENERAL

This section outlines the necessary precautions for proper and safe machine usage and maintenance. For proper machine use, it is mandatory that a daily routine is established based on the content of this manual. A maintenance program, using the information provided in this manual and the Service and Maintenance Manual, must also be established by a qualified person and followed to ensure that the machine is safe to operate.

The owner/user/operator/lessor/lessee of the machine should not operate this machine until this manual has been read, training is accomplished, and operation of the machine has been completed under the supervision of an experienced and qualified operator.

If there are any questions with regard to safety, training, inspection, maintenance, application, and operation, please contact JLG Industries, Inc. (“JLG”).

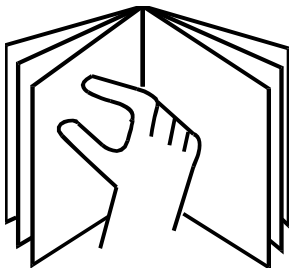
⚠ WARNING

FAILURE TO COMPLY WITH THE SAFETY PRECAUTIONS LISTED IN THIS MANUAL COULD RESULT IN MACHINE DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

1.2 PRE-OPERATION

Operator Training and Knowledge

- Read and understand this manual before operating the machine.



- Do not operate this machine until complete training is performed by authorized persons.
- Only authorized and qualified personnel can operate the machine.
- Read, understand, and obey all DANGERS, WARNINGS, CAUTIONS, and operating instructions on the machine and in this manual.
- Use the machine in a manner which is within the scope of its intended application set by JLG.
- All operating personnel must be familiar with the emergency controls and emergency operation of the machine as specified in this manual.
- Read, understand, and obey all applicable employer, local, and governmental regulations as they pertain to operation of the machine.

Workplace Inspection

- The operator is to take safety measures to avoid all hazards in the work area prior to machine operation.
- Do not swing turntable or raise the platform while on trucks, trailers, railway cars, floating vessels, scaffolds or other equipment unless approved in writing by JLG.
- Do not operate the machine in hazardous environments unless approved for that purpose by JLG.
- Be sure that the ground conditions are able to support the maximum load shown on the decals located on the machine.
- This machine can be operated in temperatures of -20^{o} C to 40^{o} C (0^{o} F to 104^{o} F). Consult JLG for operation outside this range.

Machine Inspection

- Before machine operation, perform inspections and functional checks. Refer to Section 2 of this manual for detailed instructions.
- Do not operate this machine until it has been serviced and maintained according to requirements specified in the Service and Maintenance Manual.
- Be sure all safety devices are operating properly. Modification of these devices is a safety violation.
- Do not operate any machine on which safety or instruction placards or decals are missing or illegible.
- Avoid any buildup of debris on the platform floor. Keep mud, oil, grease, and other slippery substances from footwear and platform floor.

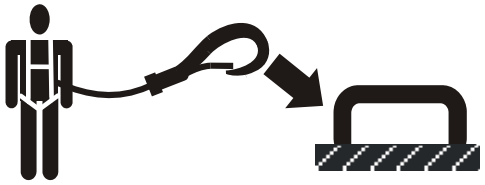
1.3 OPERATION

General

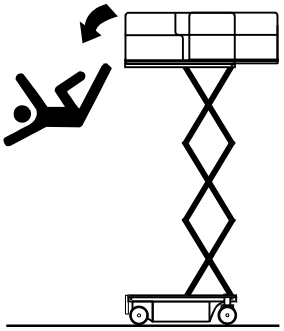
- Do not use the machine for any purpose other than positioning personnel, their tools, and equipment.
- Never operate a machine that is not working properly. If a malfunctions occurs, shut down the machine.
- Never slam a control switch or lever through neutral to an opposite direction. Always return switch to neutral and stop before moving the switch to the next function. Operate controls with slow and even pressure.
- Hydraulic cylinders should never be left fully extended or fully retracted before shutdown or for long periods of time.
- Do not allow personnel to tamper with or operate the machine from the ground with personnel in the platform, except in an emergency.
- Do not carry materials directly on platform railing unless approved by JLG.
- When two or more persons are in the platform, the operator shall be responsible for all machine operations.
- Always ensure that power tools are properly stowed and never left hanging by their cord from the platform work area.
- Supplies or tools which extend outside the platform are prohibited unless approved by JLG
- Do not assist a stuck or disabled machine by pushing, pulling, or by using machine functions. Only pull the unit from the tie-down lugs on the chassis.
- Stow elevating assembly and shut off all power before leaving machine.

Trip and Fall Hazards

- When operating a boom lift or vertical mast lift, occupants in the platform must wear a full body harness with a lanyard attached to an authorized lanyard anchorage point. When operating a scissor lift or vertical mast lift, JLG recommends wearing a full body harness. Attach only one (1) lanyard per lanyard anchorage point.



- Before operating the machine, make sure all gates are closed and fastened or in their proper position.

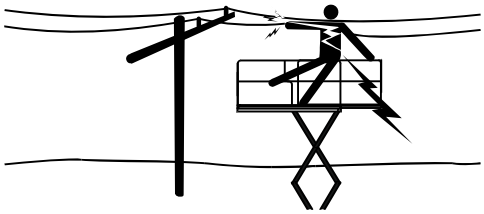


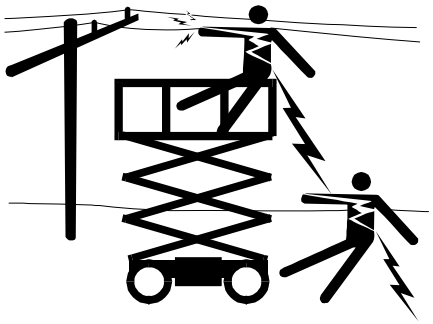
- Keep both feet firmly positioned on the platform floor at all times. Never use ladders, boxes, steps, planks, or similar items on platform to provide additional reach.
- Never use the elevating assembly to enter or leave the platform.
- Use extreme caution when entering or leaving platform. Be sure that the platform is fully lowered. Face the machine, maintain “three point contact” with the machine, using two hands and one foot or two feet and one hand during entry and exit.
- Check orientation of directional arrows on chassis before driving. The direction of drive and steer may be opposite from normal operation based upon orientation of chassis.

- Platform-to-structure transfers at elevated positions are discouraged. Where transfer is necessary, enter/exit through the gate only with the platform within 0.3m (1 ft) of a safe and secure structure. 100% tie-off is also required in this situation using two lanyards. One lanyard must be attached to the platform with the second lanyard attached to the structure. The lanyard connected to the platform must not be disconnected until the transfer to the structure is safe and complete.

Electrocution Hazards

- This machine is not insulated and does not provide protection from contact or proximity to electrical current.





- Maintain safe distance from electrical lines, apparatus, or any energized (exposed or insulated) parts according to the Minimum Safe Approach Distance (MSAD) as shown in Table 1-1.
- Allow for machine movement and electrical line swaying.

Table 1-1.Minimum Safe Approach Distances (M.S.A.D.)

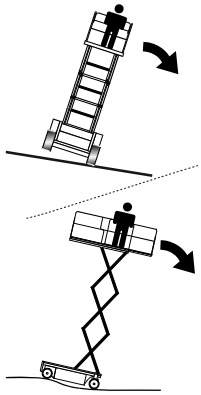
Voltage Range (Phase to Phase)	MINIMUM SAFE APPROACH DISTANCE in Meters (Feet)
0 to 300V	AVOID CONTACT
Over 300V to 50 KV	3 (10)
Over 50KV to 200 KV	5 (15)
Over 200 KV to 350 KV	6(20)
Over 350 KV to 500 KV	8 (25)
Over 500 KV to 750 KV	11 (35)
Over 750 KV to 1000 KV	14 (45)

⚠ DANGER

DO NOT MANEUVER MACHINE OR PERSONNEL INSIDE PROHIBITED ZONE (MSAD). ASSUME ALL ELECTRICAL PARTS AND WIRING ARE ENERGIZED UNLESS KNOWN OTHERWISE.

Tipping Hazards

- The user should be familiar with the surface before driving. Do not exceed the allowable sideslope and grade while driving..

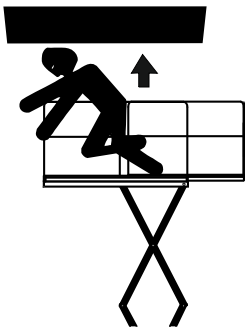


- Do not elevate platform or drive with platform elevated while on a sloping, uneven, or soft surface.
- Before driving on floors, bridges, trucks, and other surfaces, check allowable capacity of the surfaces.
- Never exceed the maximum platform capacity. Distribute loads evenly on platform floor.
- Do not raise the platform or drive from an elevated position unless the machine is on firm, level surfaces and evenly supported.
- Keep the chassis of the machine at least 2 ft. (0.6m) from holes, bumps, drop-offs, obstructions, debris, concealed holes, and other potential hazards on the floor/surface unless approved by JLG.
- Never attempt to use the machine as a crane. Do not tie-off machine to any adjacent structure.

- Do not operate the machine when wind conditions exceed the maximum allowable wind speed.
- Do not increase the surface area of the platform or the load. Increase of the area exposed to the wind will decrease stability.
- Do not increase the platform size with unauthorized deck extensions or attachments.
- If elevating assembly or platform is in a position that one or more wheels are off the ground, all persons must be removed before attempting to stabilize the machine. Use cranes, forklift trucks, or other appropriate equipment to stabilize machine and remove personnel.

Crushing and Collision Hazards

- Approved head gear must be worn by all operating and ground personnel.
- Keep hands and limbs out of the elevating assembly during operation.
- Check work area for clearances overhead, on sides, and bottom of platform when lifting or lowering platform, and driving.



- During operation, keep all body parts inside platform railing.
- Use elevating assembly functions, not the drive function to position the platform close to obstacles
- Always post a lookout when driving in areas where vision is obstructed.
- Keep non-operating personnel at least 1.8m (6 ft.) away from machine during all driving operations.
- Limit travel speed according to conditions of ground surface, congestion, visibility, slope, location of personnel, and other factors which may cause collision or injury to personnel.
- Be aware of stopping distances in all drive speeds. When driving in high speed, switch to low speed before stopping. Travel grades in low speed only.
- Do not use high speed drive in restricted or close quarters or when driving in reverse.
- Exercise extreme caution at all times to prevent obstacles from striking or interfering with operating controls and persons in the platform.
- Be sure that operators of other overhead and floor level machines are aware of the aerial work platform's presence. Disconnect power to overhead cranes.
- Warn personnel not to work, stand, or walk under a raised platform. Position barricades on floor if necessary.

1.4 TOWING, LIFTING, AND HAULING

- Never allow personnel in platform while towing, lifting, or hauling.
- This machine should not be towed, except in the event of emergency, malfunction, power failure, or loading/unloading. Refer to the Emergency Procedures section of this manual for emergency towing procedures.
- The platform must be completely empty of tools.
- When lifting machine, lift only at designated areas of the machine. Lift with lifting equipment of adequate capacity.
- Refer to the Machine Operation section of this manual for lifting information.

1.5 ADDITIONAL HAZARDS / SAFETY

- Do not use machine as a ground for welding.
- Do not refuel the machine with the engine running.
- Battery fluid is highly corrosive. Avoid contact with skin and clothing at all times.
- Charge batteries only in a well ventilated area.

SECTION 2. MACHINE PREPARATION AND INSPECTION

2.1 GENERAL

This section provides the necessary information needed by those personnel that are responsible to place the machine in operation readiness, and lists checks that are performed prior to use of the machine. It is important that the information contained in this section be read and understood before any attempt is made to operate the machine. Ensure that all the necessary inspections have been completed successfully before placing the machine into service. These procedures will aid in obtaining maximum service life and safe operation.

⚠ IMPORTANT

SINCE THE MACHINE MANUFACTURER HAS NO DIRECT CONTROL OVER THE FIELD INSPECTION AND MAINTENANCE, SAFETY IS THE RESPONSIBILITY OF THE OWNER/OPERATOR.

2.2 PREPARATION FOR USE

Before a new machine is put into operation it must be carefully inspected for any evidence of damage resulting from shipment and inspected periodically thereafter as outlined in the Delivery and Frequent Inspection. The unit should be thoroughly checked for hydraulic leaks during initial start-up and run. A check of all components should be made to assure their security.

All preparations necessary to place the machine in operation readiness status are the responsibility of management personnel. Preparation requires good common sense, (i.e. lift works smoothly and brakes operate properly) coupled with a series of visual inspections. The mandatory requirements are given in the Daily Walk Around Inspection.

It should be assured that the items appearing in the Delivery and Periodic Inspection and Functional Check are complied with prior to putting the machine into service.

2.3 DELIVERY AND FREQUENT INSPECTION

NOTE: *This machine requires periodic safety and maintenance inspections by a JLG distributor, or certified JLG mechanic.*

NOTE: *An annual inspection shall be performed on the aerial platform no later than thirteen (13) months from the date of the prior annual inspection. The inspection shall be performed by person(s) certified as a mechanic on the specific make and model of the aerial platform.*

The following checklist provides a systematic inspection to assist in detecting defective, damaged, or improperly installed parts. The checklist denotes the items to be inspected and conditions to examine. Frequent inspection shall be performed monthly or more often when required by environment, severity, and frequency of usage.

This checklist is also applicable and must be followed for all machines that have been in storage or for all machines that will be exposed to harsh or changing climates.

These check are also to be performed after maintenance has been performed on the machine.

Handrail Assemblies

Properly installed; no loose or missing parts; no visible damage.

Platform Assembly

No visible damage; free of dirt and debris.

Sizzor Arms

No visible damage, abrasions and/or distortions.

Electrical Cable

No visible damage; properly secured.

Pivot Pins

No loose or missing retaining hardware; no visible damage; no evidence of pin or bushing wear.

Lift Cylinder

No rust, nicks, scratches or foreign material on piston rod; no leakage.

Frame

No visible damage; loose or missing hardware (top and underside).

Tire and Wheel Assemblies

No loose or missing lug nuts; no visible damage; check drive hoses for damage.

Sliding Wear Pad Blocks

No excessive wear.

Hydraulic Oil Supply

Operate lift function through one complete cycle before checking oil level. Oil level should be at full mark or within 1.5 cm (0.5 in) below full mark on side of hydraulic tank (all systems shut down, machine in stowed position); No visible oil leaks on the ground.

Steer Cylinder

No rust, nicks, scratches or foreign material on piston rod; no leakage.

Steer Linkage

No loose or missing parts; no visible damage.

Front Spindle Assemblies

No excessive wear; no damage; evidence of proper lubrication.

Control Boxes (Platform and Ground)

Switches operable; no visible damage; placards secure and legible; controller operable; no visible damage.

Batteries

Proper electrolyte level; cable connections tight; no visible damage; no corrosion at battery cable connections. Ensure batteries are fully charged.

Motor/Pump Unit and Valves

No leakage; units secure.

Platform Placards

No visible damage; placards secure and legible.

2.4 DAILY WALK-AROUND INSPECTION

It is the users responsibility to inspect the machine before the start of each workday. It is recommended that each user inspect the machine before operation, even if the machine has already been put into service under another user. This Daily Walk-Around Inspection is the preferred method of inspection.

These checks are also to be performed after maintenance has been performed on the machine.

In addition to the Daily Walk-Around Inspection, be sure to include the following as part of the daily inspection:

Overall Cleanliness

Check all standing surfaces for oil, fuel and hydraulic oil spillage and foreign objects. Ensure overall cleanliness.

Placards

Keep all information and operating placards clean and unobstructed. Cover when spray painting or shot blasting to protect legibility.

Operators and Safety Manual

Ensure a copy of this manual is enclosed in the manual storage box.

Machine Log

Ensure a machine operating record or log is kept. Check to see that it is current and that no entries have been left uncleared, leaving machine in an unsafe condition for operation.

Daily Lubrication

For those items pointed out in the Daily Walk-Around Inspection requiring daily lubrication, refer to the Lubrication Chart for specific requirements.

2.5 DAILY FUNCTIONAL CHECK

Perform functional checks in accordance with the Daily Functional Check before attempting to operate the machine.

⚠ WARNING

TO AVOID INJURY DO NOT OPERATE A MACHINE UNTIL ALL MALFUNCTIONS HAVE BEEN CORRECTED. USE OF A MALFUNCTIONING MACHINE IS A SAFETY VIOLATION.

A functional check of all systems should be performed, under no load, once the walk-around inspection is complete, in an area free of overhead and ground level obstructions. Perform pre-load functional check in accordance with the following procedure:

1. Ensure batteries are fully charged.
2. Raise and lower platform several times. Check for smooth elevation and lowering. Check for High Drive cut-out as platform begins to raise. Check that pothole protection system is deployed when platform is raised and that actuating rollers are in contact with the connecting bar.

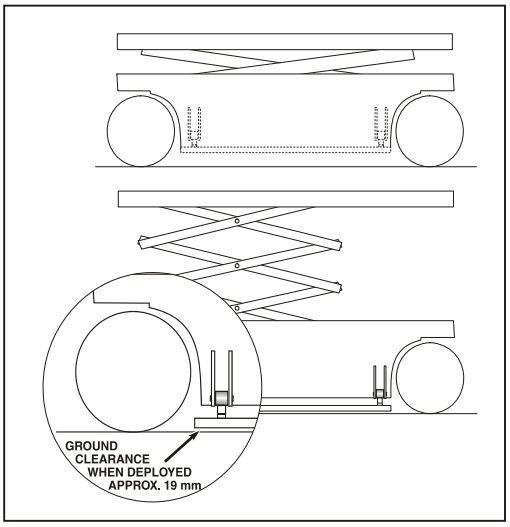


Figure 2-1. Pothole Protection System Operation

3. Drive forward and reverse, check for proper operation.
4. Check that drive brake holds when machine is driven up a hill, not to exceed rated gradeability, and stopped.
5. Steer left and right. Check for proper operation.
6. Check fluid level on hydraulic oil reservoir. Refer to the Lubrication Chart.

2.6 TORQUE REQUIREMENTS

The Torque Chart consists of standard torque values based on bolt diameter and grade, also specifying dry and wet torque values in accordance with recommended shop practices. This chart is provided as an aid to the operator in the event he/she notices a condition that requires prompt attention during the walk-around inspection or during operation until the proper service personnel can be notified. The Service and Maintenance Manual provides specific torque values and periodic maintenance procedures with a listing of individual components. Utilizing this Torque Chart in conjunction with the preventive maintenance procedures in the Service and Maintenance Manual will enhance safety, reliability and performance of the machine.

2.7 BATTERY CHARGING

At the end of the work day, the batteries should be charged for the next days work. Position the Emergency Stop switch to OFF. Prior to charging, be sure electrolyte covers plates. Connect the battery charger to a properly grounded receptacle using a suitable extension cord. Set the battery charger timer switch, if equipped, for the desired charging time. After charging, check the electrolyte level of the batteries and adjust accordingly. Add distilled water only to batteries. A fully charged battery will have a specific gravity of between 1.260 - 1.275 on a hydrometer.

⚠ CAUTION

WHEN ADDING DISTILLED WATER TO THE BATTERIES, A NON-METALLIC CONTAINER AND/OR FUNNEL MUST BE USED. ADD WATER ONLY TO LEVEL INDICATOR OR 0.95 CM (3/8 INCH) ABOVE SEPARATORS.

NO OPEN FLAMES OR SMOKING WHEN CHARGING BATTERIES.

CHARGE BATTERIES ONLY IN A WELL VENTILATED AREA.

ENSURE THAT BATTERY ACID DOES NOT COME INTO CONTACT WITH SKIN OR CLOTHING.

NOTE: *Be sure to disconnect and store any extension cords after charging batteries and before putting machine into service.*
To avoid electrolyte overflow, add distilled water to batteries after charging.

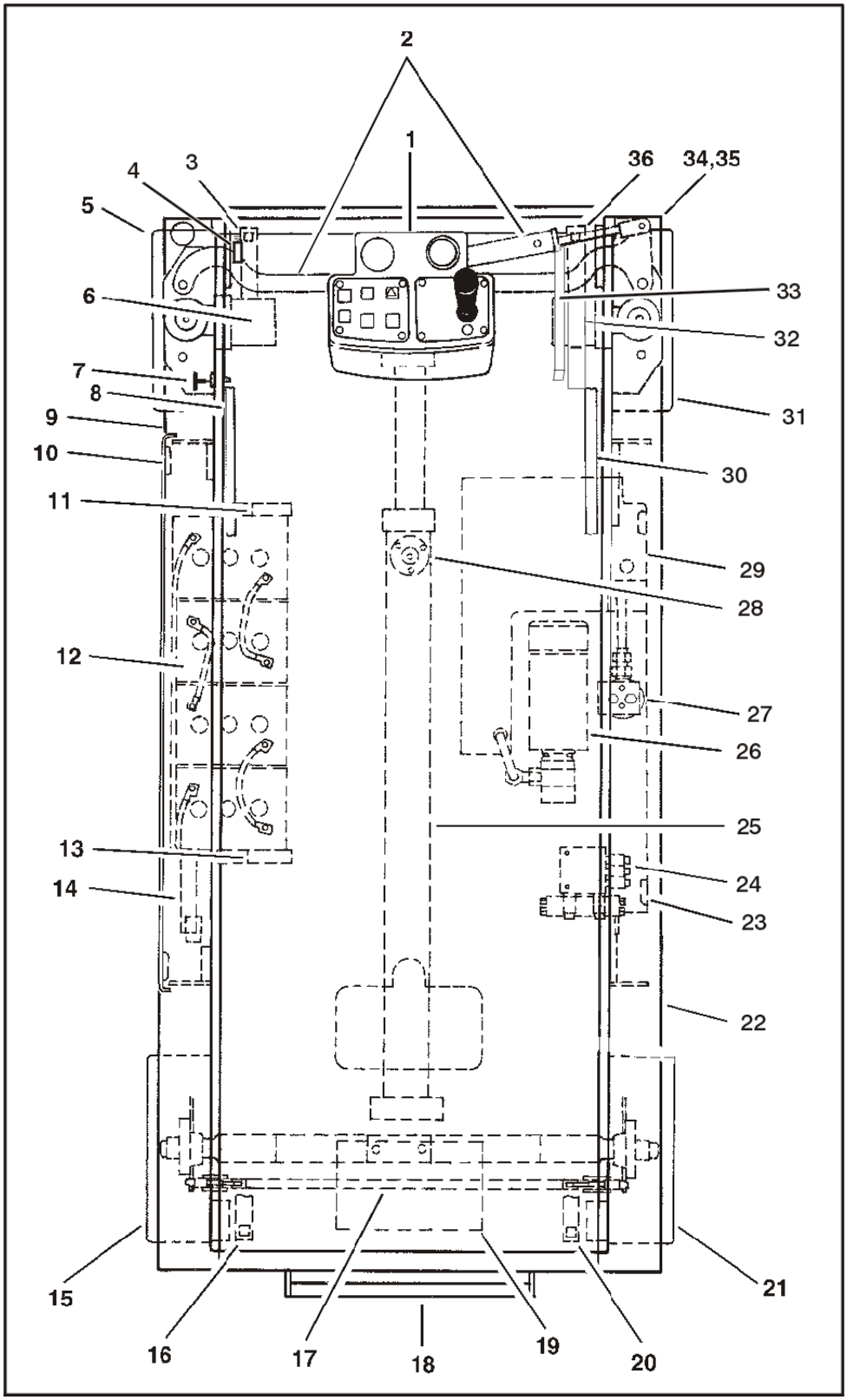


Figure 2-2. Daily Walk-Around Inspection Diagram

General

Begin the "Walk-Around Inspection" at Item 1, as noted on the diagram. Continue to the right (counter-clockwise viewed from top) checking each item in sequence for the conditions listed in the "Walk-Around inspection Checklist."

⚠ WARNING

TO AVOID INJURY DO NOT OPERATE MACHINE UNTIL ALL MALFUNCTIONS HAVE BEEN CORRECTED. USE OF A MALFUNCTIONING MACHINE IS A SAFETY VIOLATION.
TO AVOID POSSIBLE INJURY, BE SURE MACHINE POWER IS "OFF" DURING "WALK-AROUND INSPECTION."

NOTE: *Do not overlook visual inspection of chassis underside. Checking this area often results in discovery of conditions which could cause extensive machine damage.*

1. Platform Controls - Properly secured; no loose or missing parts; no visible damage to control box or controller (joystick). Placards secure and legible; control markings legible; manual in manual storage box.
2. Steer Cylinder and Linkage - Properly secured; no loose or missing parts; no visible damage; no evidence of steer cylinder leakage.
3. Scissor Arms and Sliding Wear Pads - Properly secured; no visible damage; no loose or missing parts.
4. High Drive Limit Switch - Properly secured; no visible damage; no loose or missing parts.
5. Steer/Drive Wheel and Tire Assembly, Left Front - Properly secured; no loose or missing lug nuts; no visible damage; check drive hoses.
6. Drive Motor, Left Front - Properly secured; no visible damage; no evidence of leakage.
7. Manual Descent Cable and Pull Handle - Properly secured; no loose or missing parts; no visible damage.
8. Powered Deck Extension Cylinder (If Equipped) - Properly secured; no visible damage; no loose or missing parts; no evidence of leakage.
9. Pothole Protection System - Support bar, rollers, limit switches, springs and links properly secured; no visible damage; no loose or missing parts.
10. Compartment Cover and Latches - Cover and latches in working condition; properly secured; no loose or missing parts.
11. Machine Controller (1532E3 and 1932E3) - Properly secured; no visible damage; no loose or broken wiring.
12. Battery Installation - Proper electrolyte level; cables secure; no damage or corrosion. Hold-downs secure.
13. Machine Controller (2033E3, 2046E3, 2646E3 and 2658E3) - Properly secured; no visible damage; no loose or broken wiring.
14. Ground Controls - Properly secured; no visible damage; switches operable; placards secure and legible.
15. Wheel and Tire Assembly, Left Rear - Properly secured; no loose or missing lug nuts; no visible damage.
16. Scissor Arms and Sliding Wear Pads - Properly secured; no visible damage; no loose or missing parts.
17. Parking Brake - No loose or missing parts; no visible damage; no cylinder leakage.
18. Ladder - Properly secured; no visible damage; no loose or missing hardware.
19. Battery Charger - No visible damage; properly secured.
20. Scissor Arms and Sliding Wear Pads - Properly secured; no visible damage; no loose or missing parts.
21. Wheel and Tire Assembly, Right Rear - Properly secured; no loose or missing lug nuts; no visible damage.
22. Pothole Protection System - Support bar, rollers, limit switches and links properly secured; no visible damage; no loose or missing parts.
23. Compartment Cover and Latches - Cover and latches in working condition; properly secured; no visible damage; no loose or missing parts.
24. Control Valve Installation - No loose or missing parts; no evidence of leakage. No unsupported wires or hoses; no damaged or broken wires.
25. Lift Cylinder - Properly secured; no visible damage; no loose or missing parts; no evidence of leakage.

Figure 2-3. Daily Walk-Around Inspection Points (Sheet 1 of 2)

26. Motor/Pump Unit - Properly secured; no visible damage; no evidence of hydraulic leakage.
27. Hydraulic Filter - No visible damage; properly secured; no evidence of leakage
28. Tilt Switch - Properly secured; no loose or missing parts; no visible damage; no loose or broken wires.
29. Hydraulic Reservoir - No visible damage; no loose or missing parts; no evidence of leakage. Recommended hydraulic fluid level on side of tank. Breather cap secure and working.
30. Powered Deck Extension Cylinder (If Equipped) - Properly secured; no visible damage; no loose or missing parts; no evidence of leakage.
31. Steer/Drive Wheel and Tire Assembly, Right Front - Properly secured; no loose or missing lug nuts; no visible damage; check drive hoses.
32. Drive Motor, Right Front - Properly secured;no visible damage; no evidence of leakage.
33. Safety Prop - Properly secured;no loose or missing parts; no visible damage.
34. Handrail Installation - All railings securely attached; no visible damage;no missing parts; chain improper working order. If equipped, access gate properly secured and in good working order.
35. Platform Assembly - No loose or missing parts;no visible damage; platform deck extension operates properly.
36. Scissor Arms and Sliding Wear Pads - Properly secured;no visible damage; no loose or missing parts.
37. (Not Shown on Illustration) Valves, Valve Fittings, Hosing and Tubing - Properly secured; no loose or missing parts; no visible damage;no evidence of leakage.

Figure 2-4. Daily Walk-Around Inspection Points (Sheet 2 of 2)

SIZE	THD	BOLT DIA. (CM)	THREAD STRESS AREA (SQ. CM)	VALUES FOR ZINC PLATED BOLTS ONLY									UNPLATED CAP SCREWS	
				SAE GRADE 5 BOLTS & GRADE 2 NUTS					SAE GRADE 8 BOLTS & GRADE 8 NUTS				UNBRAKO 1960 SERIES SOCKET HEAD CAP SCREW WITH LOC-WEL PATCH	
				CLAMP LOAD (KG)	TORQUE				CLAMP LOAD (KG)	TORQUE			CLAMP LOAD (KG)	TORQUE (as received)
					(DRY OR LOC. 263)	(LUB.)	(LOCTITE 262)	(LOCTITE 242 OR 271)		(DRY OR LOC. 263)	(LUB.)	(LOCTITE 262)	(LOCTITE 242 OR 271)	
					NM	NM	NM	NM		NM	NM	NM	NM		NM
4	40	0.2845	0.0153	172	1	1	—	—	245	2	1	—	—	—	—
	48		0.0168	191	1	1	—	—	272	2	1	—	—	—	—
6	32	0.3505	0.0232	263	2	2	—	—	372	3	2	—	—	—	—
	40		0.0258	277	2	2	—	—	417	3	2	—	—	—	—
8	32	0.4166	0.0356	408	4	3	—	—	572	5	4	—	—	—	—
	36		0.0374	426	4	3	—	—	599	5	4	—	—	—	—
10	24	0.4826	0.0445	508	5	4	—	—	717	7	5	—	—	—	—
	32		0.0508	583	6	4	—	—	817	8	6	—	—	—	—
1/4	20	0.6350	0.0808	916	11	9	—	12	1297	16	12	—	18	1442	18
	28		0.0925	1052	14	10	—	16	1488	19	14	—	21	1651	19
5/16	18	0.7938	0.1331	1515	23	18	22	26	2141	34	25	30	41	2377	34
	24		0.1473	1678	26	19	23	29	2821	34	27	34	41	2631	37
3/8	16	0.9525	0.1969	2241	41	31	38	48	3175	61	48	54	68	3493	61
	24		0.2230	2540	48	34	43	54	3583	68	48	61	75	3983	68
7/16	14	1.1112	0.2700	3085	68	48	61	75	4332	95	75	85	109	4822	95
	20		0.3015	3425	75	68	68	81	4854	109	81	95	122	5384	102
1/2	13	1.2700	0.3604	4105	102	75	92	115	5783	149	109	130	163	6437	149
	20		0.4061	4854	122	88	108	136	6532	163	122	146	183	7253	156
9/16	12	1.4288	0.4623	5262	149	109	133	163	7539	204	149	188	224	8256	210
	18		0.5156	5874	163	122	148	183	8278	231	176	209	258	9208	224
5/8	11	1.5875	0.5740	6532	204	149	183	224	9231	298	231	244	326	10251	285
	18		0.6502	7394	231	176	207	258	10433	326	244	277	359	11612	298
3/4	10	1.9050	0.8484	9662	353	271	325	387	13653	515	380	408	570	15150	495
	16		0.9474	10796	407	298	363	448	15241	570	434	456	631	16919	542
7/8	9	2.2225	1.1735	13336	583	434	523	644	18870	814	624	658	895	20956	793
	14		1.2929	14697	637	475	576	705	20775	895	678	724	983	23088	861
1	8	2.5400	1.5392	17509	868	651	785	915	23360	1220	922	931	1342	27488	1173
	12		1.6840	19142	949	719	858	997	27080	1356	1003	1079	1492	30074	1241
1-1/8	7	2.8575	1.9380	19187	1085	814	968	1139	31162	1736	1302	1396	1898	34610	1681
	12		2.1742	21546	1193	895	1087	1254	34927	1953	1464	1566	2136	38828	1871
1-1/4	7	3.1750	2.4613	24404	1519	1139	1368	1593	38554	2468	1844	1970	2712	43954	2373
	12		2.7254	27035	1681	1247	1516	1762	43818	2712	2034	2183	2983	48671	2549
1-1/2	6	3.4925	2.9337	29076	1980	1492	1792	2068	47174	3227	2413	2586	3559	52391	3145
	12		3.3401	33113	2278	1708	2042	2373	53570	3688	2766	2935	4068	59648	3308
1-1/2	6	3.8100	3.5687	35381	2630	1980	2379	2746	57380	4284	3200	3430	4712	63731	4122
	12		4.0132	39781	2983	2224	2676	3118	142200	4827	3607	3856	5322	71669	4433

Note: These torque values do not apply to cadium plated fasteners.

Figure 2-5. Torque Chart

SAE GRADE 5

SAE GRADE 8

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SECTION 3. USER RESPONSIBILITIES AND MACHINE CONTROL

3.1 GENERAL

⚠ IMPORTANT

SINCE THE MANUFACTURER HAS NO DIRECT CONTROL OVER MACHINE APPLICATION AND OPERATION, CONFORMANCE WITH GOOD SAFETY PRACTICES IN THESE AREAS IS THE RESPONSIBILITY OF THE USER AND HIS OPERATING PERSONNEL.

This section provides the necessary information needed to understand control functions. Included in this section are the operating characteristics and limitations, and functions and purposes of controls and indicators. It is important that the user read and understand the proper procedures before operating the machine. These procedures will aid in obtaining optimum service life and safe operation.

3.2 PERSONNEL TRAINING

The scissor lift is a personnel handling device; therefore, it is essential that it be operated and maintained only by authorized personnel who have demonstrated that they understand the proper use and maintenance of the machine. It is important that all personnel who are assigned to and responsible for the operation and maintenance of the machine undergo a thorough training program and check out period in order to become familiar with the characteristics prior to operating the machine.

Persons under the influence of drugs or alcohol or who are subject to seizures, dizziness or loss of physical control must not be permitted to operate the machine.

Operator Training

Operator training must include instruction in the following:

1. Use and limitations of the platform controls, ground controls, emergency controls and safety systems.
2. Knowledge and understanding of this manual and of the control markings, instructions and warnings on the machine itself.
3. Knowledge and understanding of all safety work rules of the employer and of Federal, State and Local Statutes, including training in the recognition and avoidance of potential hazards in the work place; with particular attention to the work to be performed.
4. Proper use of all required personnel safety equipment.
5. Sufficient knowledge of the mechanical operation of the machine to recognize a malfunction or potential malfunction.
6. The safest means to operate near overhead obstructions, other moving equipment, obstacles, depressions, holes, dropoffs, etc. on the supporting surface.
7. Means to avoid the hazards of unprotected electrical conductors.
8. Any other requirements of a specific job or machine application.

Training Supervision

Training must be done under the supervision of a qualified operator or supervisor in an open area free of obstructions until the trainee has developed the ability to safely control a scissor lift in congested work locations.

Operator Responsibility

The operator must be instructed that he has the responsibility and authority to shut down the machine in case of a malfunction or other unsafe condition of either the machine or the job site and to request further information from his supervisor or JLG Distributor before proceeding.

NOTE: *Manufacturer or Distributor will provide qualified persons for training assistance with first unit(s) delivered and thereafter as requested by user or his personnel.*

3.3 OPERATING CHARACTERISTICS AND LIMITATIONS

General

A thorough knowledge of the operating characteristics and limitations of the machine is always the first requirement for any user, regardless of users experience with similar types of equipment.

Placards

Important points to remember during operation are provided at the control stations by DANGER, WARNING, CAUTION, IMPORTANT and INSTRUCTION placards. This information is placed at various locations for the express purpose of alerting personnel of potential hazards constituted by the operating characteristics and load limitations of the machine. See foreword for definitions of the above placards.

Capacities

Raising platform above horizontal with or without any load in platform, is based on the following criteria:

1. Machine is positioned on a smooth, firm and level surface.
2. Load is within manufacturers rated capacity.
3. All machine systems are functioning properly.

Stability

This machine, as originally manufactured by JLG and operated within its rated capacity on a smooth, firm and level supporting surface, provides a stable aerial platform for all platform positions.

3.4 CONTROLS AND INDICATORS

The machine is equipped with control panels that use symbols instead of words to indicate control functions. Refer to Symbols figure for these symbols and their corresponding functions.

JLG SMART™ System

The machine is controlled by the JLG SMART™ System, a 24 volt, multiplex motor controller which works in conjunction with a joystick and several switches to operate all machine functions.

Special operating characteristics of the JLG SMART™ System are noted where applicable. Special attention should be paid to these operating characteristics, as they may be somewhat different from those on previous JLG machines.

⚠ IMPORTANT

IT IS A GOOD PRACTICE TO AVOID PRESSURE-WASHING ELECTRICAL/ELECTRONIC COMPONENTS. SHOULD PRESSURE-WASHING BE UTILIZED TO WASH AREAS CONTAINING ELECTRICAL/ELECTRONIC COMPONENTS, JLG INDUSTRIES, INC. RECOMMENDS A MAXIMUM PRESSURE OF 52 BAR AT A MINIMUM DISTANCE OF 30.5 CM AWAY FROM THESE COMPONENTS. IF ELECTRICAL/ELECTRONIC COMPONENTS ARE SPRAYED, SPRAYING MUST NOT BE DIRECT AND BE FOR BRIEF TIME PERIODS TO AVOID HEAVY SATURATION.

Battery Charger

The battery charger is located at the rear of the machine, behind the ladder. The charger is a 24 volt DC charger with an output of 25 Amps. A built in automatic timer shuts down charger operation when the batteries are fully charged. A rocker switch circuit breaker is included to reset the charger in the event of a loss of power. LEDs on the front panel of the charger indicate the status of charger operation (Charge Complete, 80% Charge, Incomplete Charge, Charger On, Abnormal Cycle).

Ground Control Station

⚠ WARNING

DO NOT OPERATE FROM GROUND CONTROL STATION WITH PERSONNEL IN THE PLATFORM EXCEPT IN AN EMERGENCY. PERFORM AS MANY PRE-OPERATIONAL CHECKS AND INSPECTIONS FROM THE GROUND CONTROL STATION AS POSSIBLE. REFER TO SECTION 2 FOR PRE-OPERATIONAL CHECKS AND INSPECTIONS.

1. **Power Selector Switch** - A three position, key-operated Power Selector Switch supplies operating power to the platform or ground controls, as selected. When positioned to platform, the switch provides power to the emergency stop switch at the platform controls. When positioned to ground, the switch provides power to the emergency stop switch at the ground controls. With the Power Selector Switch in the center off position, power is shut off to both platform and ground controls.

NOTE: *With the Power Selector Switch in the off position, the key can be removed in order to incapacitate the machine on the jobsite to avoid unauthorized use of the machine.*
With the Power Selector Switch positioned to ground, ground functions will operate at low speed at all times.
Low speed is the default speed for all functions. When the platform is elevated, all functions operate in creep speed only.

2. **Emergency Stop Switch** - A two-position, red, mushroom-shaped Emergency Stop Switch, when positioned to on with the Power Selector Switch positioned to Ground, furnishes operating power to the ground control station. In addition, the switch can be used to turn off power to the function controls in the event of an emergency. Power is turned on by pulling the switch out (on), and is turned off by pushing the switch in (off). Turning the Emergency Stop Switch off and then on again will reset the Smart System if a system fault has occurred and the machine has shut down.
3. **Lift Switch** - A three-position, momentary-contact Lift control toggle switch provides raising and lowering of the platform when positioned to up or down.
4. **Circuit Breaker** - A push button reset 15 Amp circuit breaker, located at the ground control panel, returns interrupted power to the machine functions when depressed.
5. **Hourmeter** - The machine is equipped with an hourmeter to indicate the number of hours the machine has been operated. The hourmeter operates only when a machine function is operating.

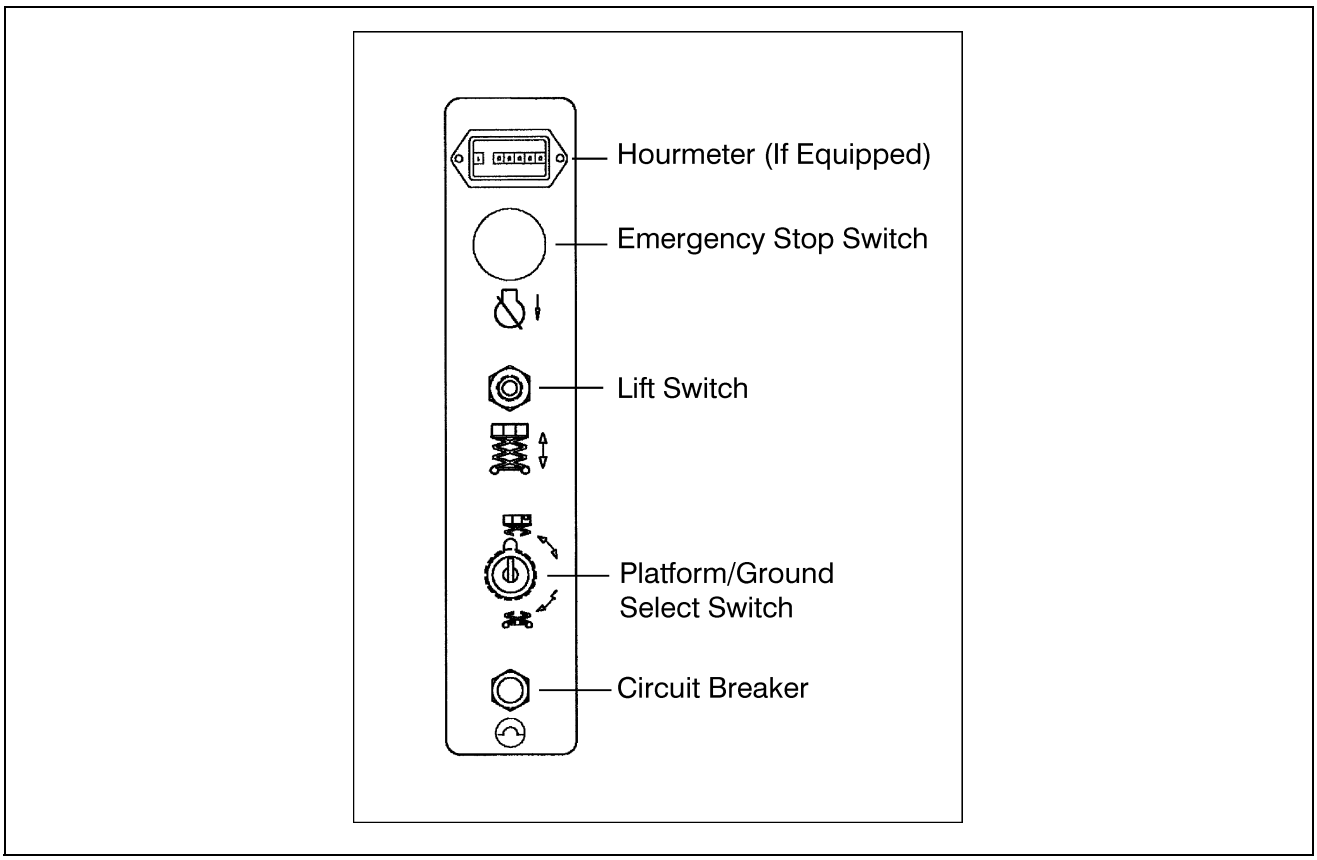

Figure 3-1. Ground Control Station - Models 1532E3/1932E3

6. **Powered Deck Extension Switch** (If Equipped - Models 2033E3, 2046E3, 2646E3, and 2658E3 Only) If the machine is equipped with either the 1.2 m or 1.8 m hydraulically-powered deck extension, this three-position, momentary contact toggle switch provides extension or retraction of the deck extension when positioned to extend or retract.

NOTE: *If the machine is equipped with a powered deck extension and the optional fold-down rails, the rails must be in the upright position before retracting the power deck extension.*

Platform Control Station

1. **Emergency Stop Switch** - A two-position, red, mushroom-shaped emergency stop switch functions to provide power to the platform control station and also to turn off power to the platform function controls in the event of an emergency. With the power selector switch positioned to platform, power is turned on by pulling the switch out (on), and is turned off by pushing the switch in (off). Turning the emergency stop switch off and then on again will reset the smart system if a system fault has occurred and the machine has shut down.

2. **Membrane Switch Panel** - The function switches at the platform control station are an integral part of a membrane switch panel, which contains switches for drive, high drive, lift, powered deck extension (if equipped), and posi-trac, plus a red tilt indicator light (if equipped). The drive, lift and powered deck extension function switches have a small green light indicator beside them which is illuminated when that function is active. The function switch light indicators will flash once or twice, then go out, when the platform emergency stop switch is turned on. If the light indicators fail to flash or if they fail to stop flashing, re-cycle the emergency stop switch. To activate the drive, lift, and powered deck functions, press the applicable function switch, then activate the joystick within three seconds to operate the function. If the joystick is not activated within three seconds, power is turned off to the function switch and the switch must be pressed again. The posi-trac and high drive functions are used in conjunction with the drive function. Do not try to operate the drive, lift, and powered deck extension functions simultaneously. If the drive, lift, and powered deck extension functions are

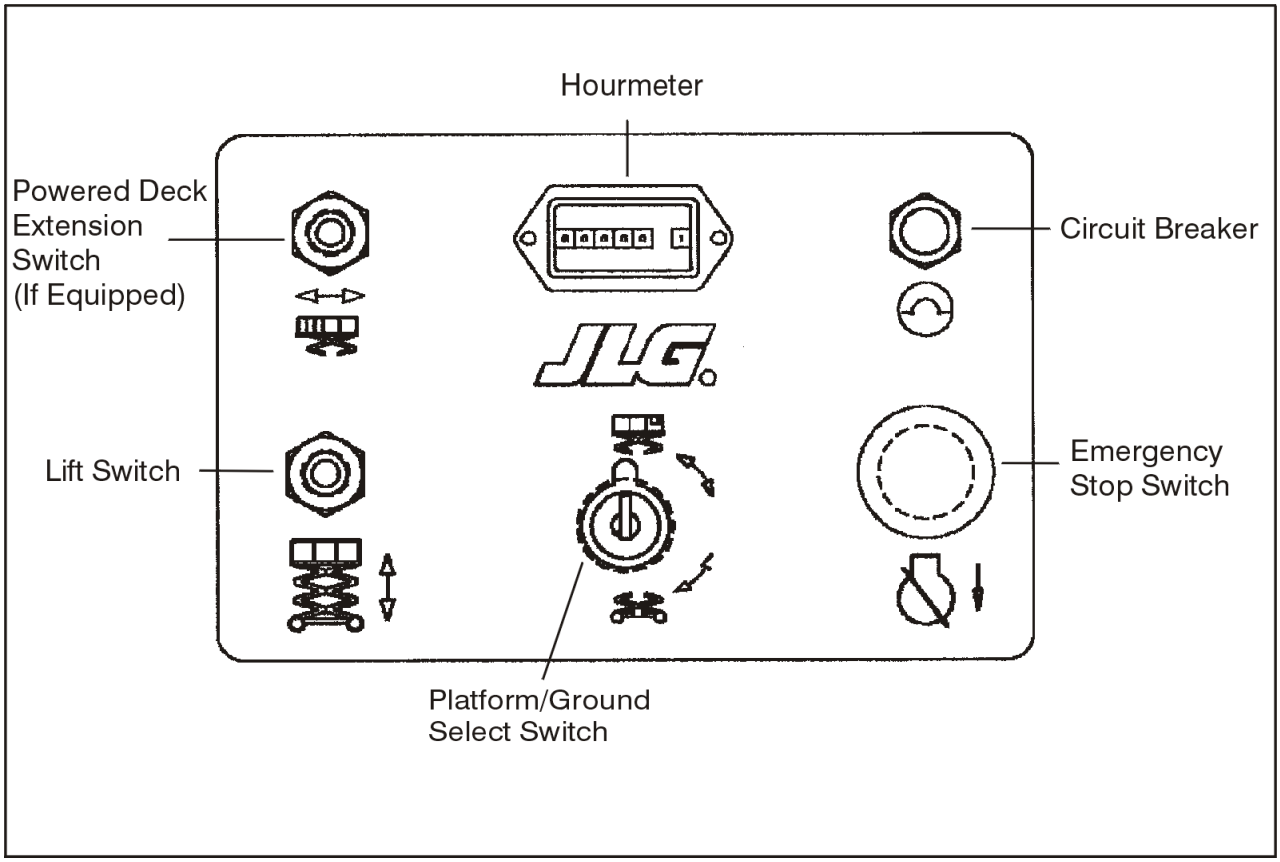

Figure 3-2. Ground Control Station - Models 2033E3/2046E3/2646E3/2658E3

selected simultaneously, no function will operate. If this occurs, pause, then press only one of the function switches to activate the function. Refer to the following paragraphs for more information about the function switches.

4. **Controller (Joystick)** - The joystick controls three functions: speed, direction, and powered deck extension (if equipped). The joystick is used in conjunction with the trigger switch and controls the drive, high drive, lift, and powered deck extension switches to control speed and direction for the selected function. The drive, high drive and posi-trac functions may be operated simultaneously, but the drive, lift, and powered deck extension functions must be operated independently of each other. If the drive, lift, and powered deck extension functions are selected simultaneously, no function will operate. If this occurs, pause, then press only one of the function switches to activate the function. To operate the joystick, squeeze the red trigger switch, then position the joystick to forward or reverse, as desired.

5. **Steer Switch** - The thumb-operated steer switch, located on top of the joystick, works in conjunction with the trigger switch and activates the steer wheels in the direction the switch is moved (left or right).

6. **Drive Switch** - The drive switch, when used in conjunction with the joystick, provides for driving the machine in forward or reverse. Drive is activated by pressing the drive switch, in conjunction with the trigger switch, and moving the joystick forward (forward) or backward (reverse). Drive speed is determined by the distance the joystick is moved forward or backward. Increased drive speed is possible when the high drive speed switch is pressed either simultaneously with the drive switch or while operating the drive function. The drive switch is part of the enable circuit, which provides power to the joystick and the drive function for 3 seconds when the drive switch is pressed. If the joystick is not activated within 3 seconds, the drive switch must be pressed again before activating the joystick. When the joystick is returned to the center off position, the operator has 3 seconds to re-activate the joystick or select another function before power is removed by the enable circuit. In addition, the posi-trac switch can be engaged while operating the drive function to give a more evenly distributed oil flow to each drive

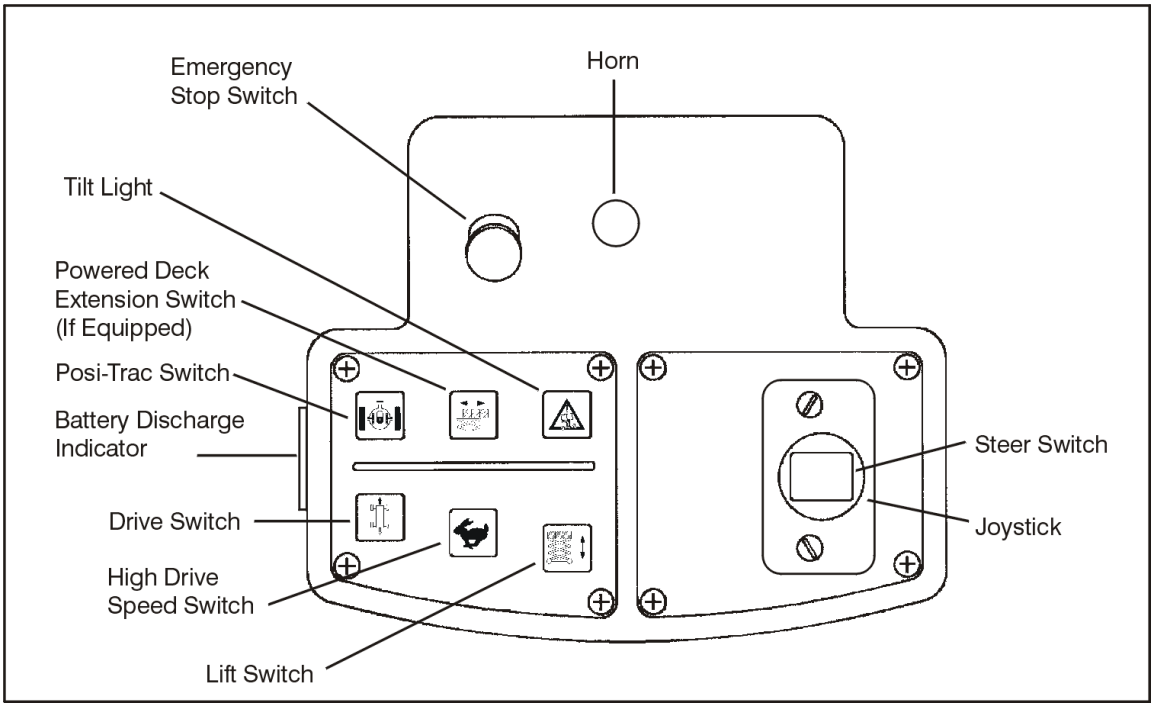

Figure 3-3. Platform Control Station - All Models

motor. Do not try to operate the drive, lift, and powered deck extension functions simultaneously. If the drive, lift, and powered deck extension functions are selected simultaneously, no function will operate. If this occurs, pause, then press only one of the function switches to activate the function.

NOTE: *If the machine is equipped with the optional powered deck extension, the drive function is cut out when the deck is extended with the platform raised above the stowed position.*
As an option, Models 2033E3 and 2646E3 may be equipped for 450 kg. platform capacity. When equipped for 450 kg. platform capacity, Model 2033E3 cuts out the drive function at a platform height of 5.2 m and Model 2646E3 cuts out the drive function at a platform height of 5.8 m.
The machine is equipped with a Pothole Protection System which lowers automatically when the platform is raised. If the Pothole Protection System does not fully lower, the drive function is cut out until the platform is completely lowered.

7. **High Drive Speed Switch** - The high drive speed switch, when used in conjunction with the joystick being operated in the drive mode, provides additional oil flow to the drive circuit for increased travel speed. To operate high drive, depress the high drive speed switch either simultaneously with the drive switch or while operating the drive function.

⚠ CAUTION

DO NOT USE HIGH DRIVE SPEED WHEN DRIVING IN CLOSE QUARTERS OR WHEN DRIVING IN REVERSE.

⚠ CAUTION

IF HIGH DRIVE IS SELECTED WHEN OIL TEMPERATURE IS VERY COLD (BELOW 4.4 DEGREES C.) HIGH DRIVE WILL NOT ENGAGE IMMEDIATELY. AS OIL WARMS (ABOVE 4.4 DEGREES C.) IF HIGH DRIVE IS SELECTED, IT WILL ENGAGE AUTOMATICALLY WHILE DRIVING.

NOTE: *The High Drive Speed switch will cut-out when the platform is raised above the stowed position, returning drive speed to low until the platform is lowered completely.*

⚠ CAUTION

DO NOT OPERATE MACHINE IF HIGH DRIVE SPEED OPERATES WHEN PLATFORM IS RAISED ABOVE THE STOWED POSITION.

8. **Lift Switch** - The lift switch, when used in conjunction with the joystick, provides for raising and lowering the platform. Lift is activated by pressing the lift switch and moving the joystick forward (lift up) or backward (lift down). Lift up speed is determined by the distance the joystick is moved forward. Lift down speed is non-adjustable, and lift down is attained by moving the joystick fully backward. The lift switch is part of the enable circuit, which provides power to the joystick and the lift function for 3 seconds when the lift switch is pressed. If the joystick is not activated within 3 seconds, the lift switch must be pressed again before activating the joystick. When the joystick is returned to the center off position, the operator has 3 seconds to re-activate the joystick or select another function before power is removed by the enable circuit. Do not try to operate the drive, lift, and powered deck extension functions simultaneously. If the drive, lift, and powered deck extension functions are selected simultaneously, no function will operate. If this occurs, pause, then press only one of the function switches to activate the function.

⚠ CAUTION

DO NOT LIFT DOWN WITHOUT COMPLETELY RETRACTING THE PLATFORM EXTENSION.

⚠ IMPORTANT

DO NOT ATTEMPT TO OPERATE THE LIFT AND DRIVE FUNCTIONS AT THE SAME TIME; NO FUNCTION WILL OPERATE AND IT WILL BE NECESSARY TO RE-SELECT A SINGLE FUNCTION.
WHEN OPERATING LIFT DOWN MOVE THE JOYSTICK TO THE FULL DOWN (FULLY BACKWARD) POSITION.

9. **Positive Traction (Posi-Trac) Switch** - This switch, when pressed, activates a solenoid on the main control valve, forcing oil through a flow divider in the drive circuit, maintaining hydraulic oil flow to both drive motors for improved traction. The positive traction (Posi-trac) switch activates the positive traction solenoid for a preset time when the positive traction (Posi-trac) switch is pressed. Positive traction is automatically de-activated after the preset time is out. This function will only operate when the drive function is activated.

10. **Powered Deck Extension Switch** (If Equipped - Models 2033E3, 2046E3, 2646E3, and 2658E3 Only.) - If the machine is equipped with either the 1.2 m or 1.8 m hydraulically-powered deck extension, this switch is used in conjunction with the joystick to provide extension or retraction of the powered deck extension. Powered deck extension or retraction is activated by pressing the powered deck extension switch and moving the joystick forward (extend) or backward (retract). The powered deck extension switch is part of the enable circuit, which provides power to the joystick and the powered deck extension function for 3 seconds when the powered deck extension switch is pressed. If the joystick is not activated within 3 seconds, the powered deck extension switch must be pressed again before activating the joystick. When the joystick is returned to the center off position, the operator has 3 seconds to re-activate the joystick or select another function before power is removed by the enable circuit. Do not try to operate the powered deck extension, drive, and lift functions simultaneously. If the powered deck extension, drive, and lift functions are selected simultaneously, no function will operate. If this occurs, pause, then press only one of the function switches to activate the function.

11. **Tilt Alarm Warning Horn** - The Tilt Alarm Warning Horn is activated by the Tilt Alarm Switch when the chassis is on a severe slope (over 1.5° or 2.0° depending on which tilt is equipped with the machine). When the machine is equipped with a powered deck extension, the horn is activated when the deck extension is being extended or retracted.

⚠ CAUTION

IF TILT ALARM IS ON WHEN PLATFORM IS RAISED, LOWER PLATFORM COMPLETELY, THEN REPOSITION MACHINE SO THAT IT IS LEVEL BEFORE RAISING PLATFORM.

12. **Tilt Alarm Warning Light** - A red warning light on the membrane switch panel that illuminates when the chassis is on a severe slope (over 1.5° or 2.0° depending on which tilt is equipped with the machine).

13. **Horn** - This push-button switch, when activated, permits the operator to warn jobsite personnel when the machine is operating in the area.

14. **Battery Discharge Indicator** - The battery discharge indicator is a gauge that provides a visual indication of the condition of the batteries.

3.5 PLACARDS AND DECALS

Read and understand all placards and decals. Do not operate any machine on which DANGER, WARNING, CAUTION, OR INSTRUCTION PLACARDS OR DECALS ARE MISSING OR ILLEGIBLE. Replace placards and decals if damaged, missing or illegible.

Decals are made of Lexan with a Pressure Sensitive Adhesive on back and a protective film on the front. Remove the damaged decal and thoroughly clean the surface before installing a new decal. Simply peel off backing paper and press decal on to the surface.

NOTE: *Placards and decals can be ordered by using part number and location found in the Parts Manual. (See the folowing figures for the location of Danger, Warning, and Caution decals).*

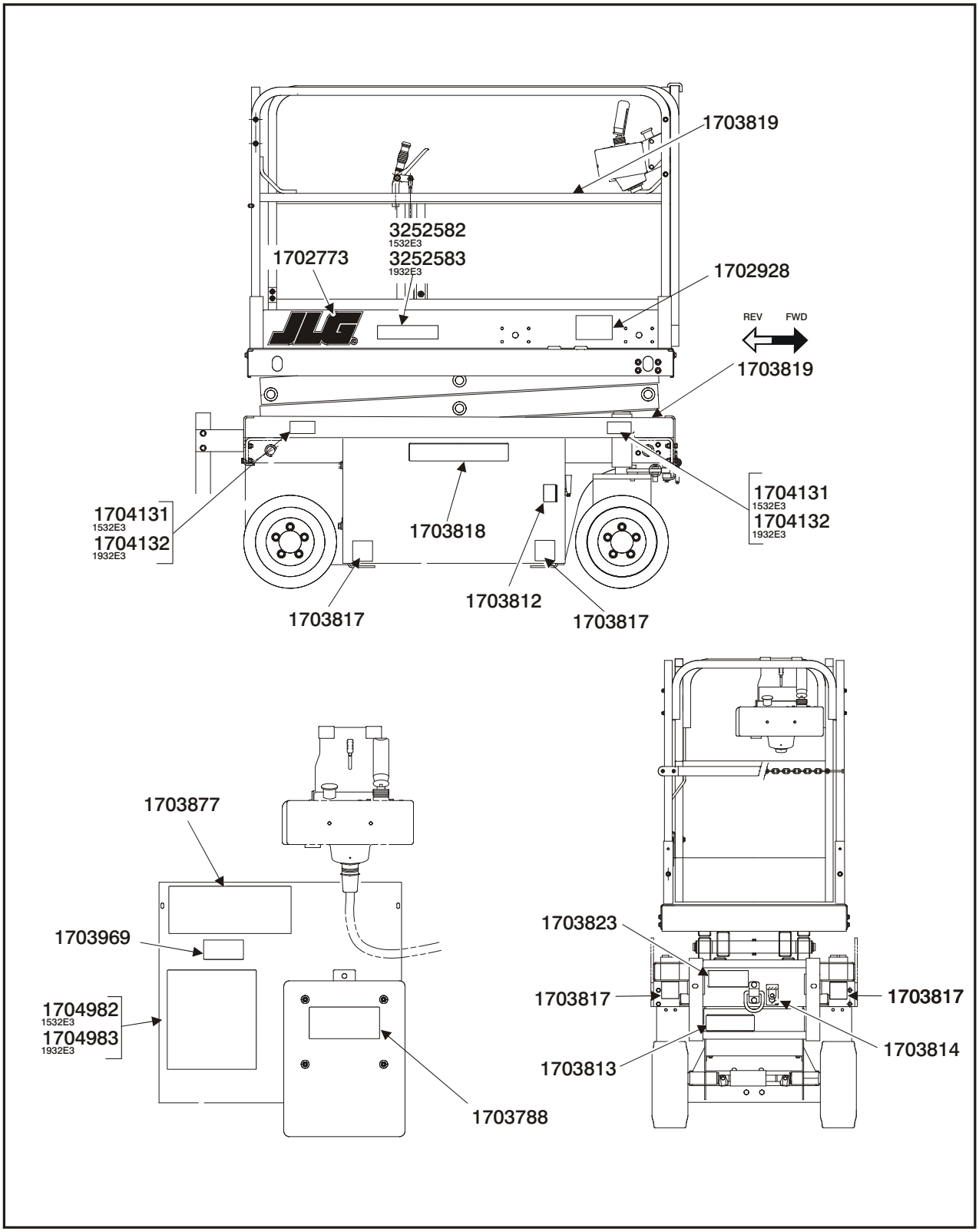

Figure 3-4. Decal Installation - 1532E3 & 1932E3 UK (Sheet 1 of 2)

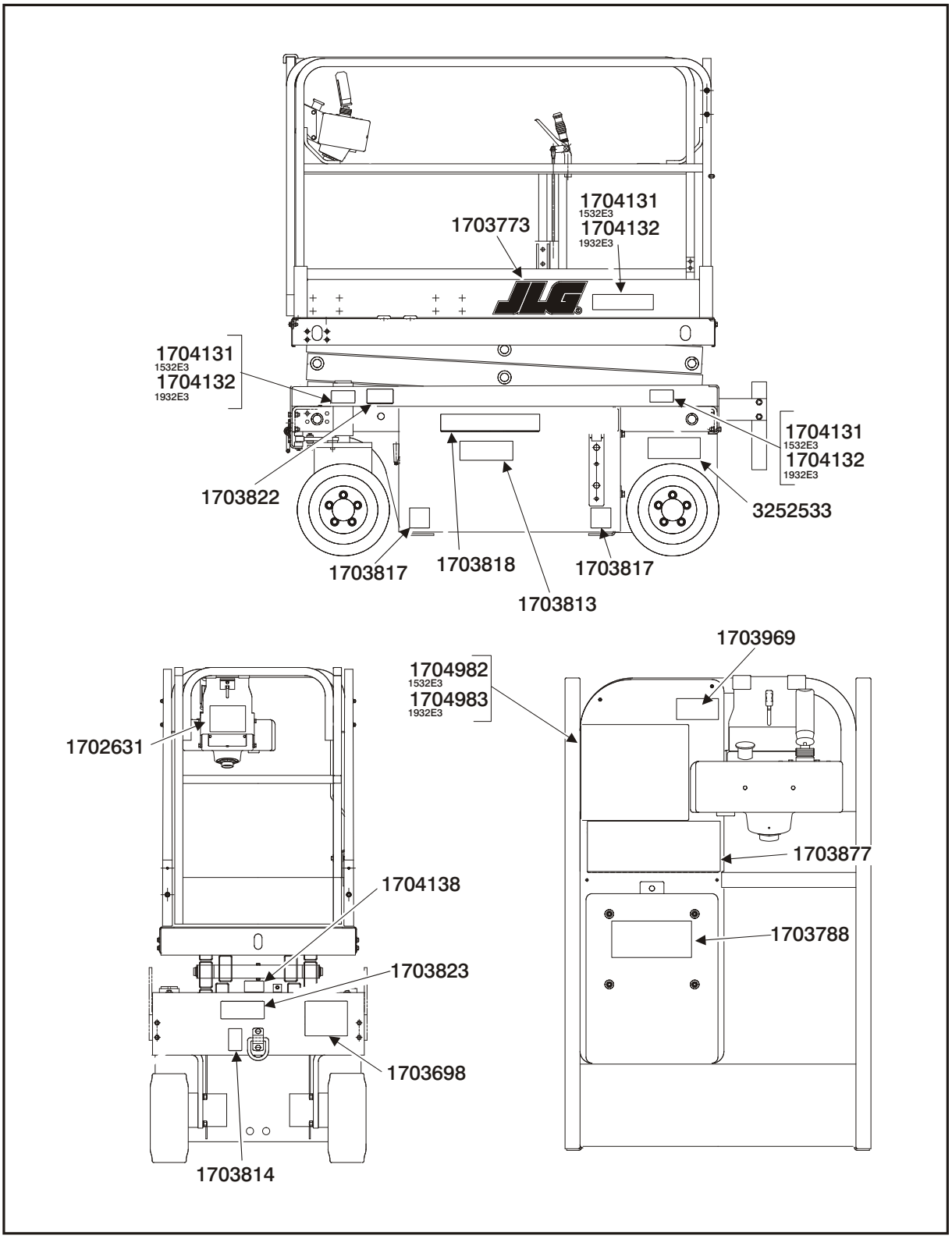

Figure 3-5. Decal Installation - 1532E3 & 1932E3 UK (Sheet 2 of 2)

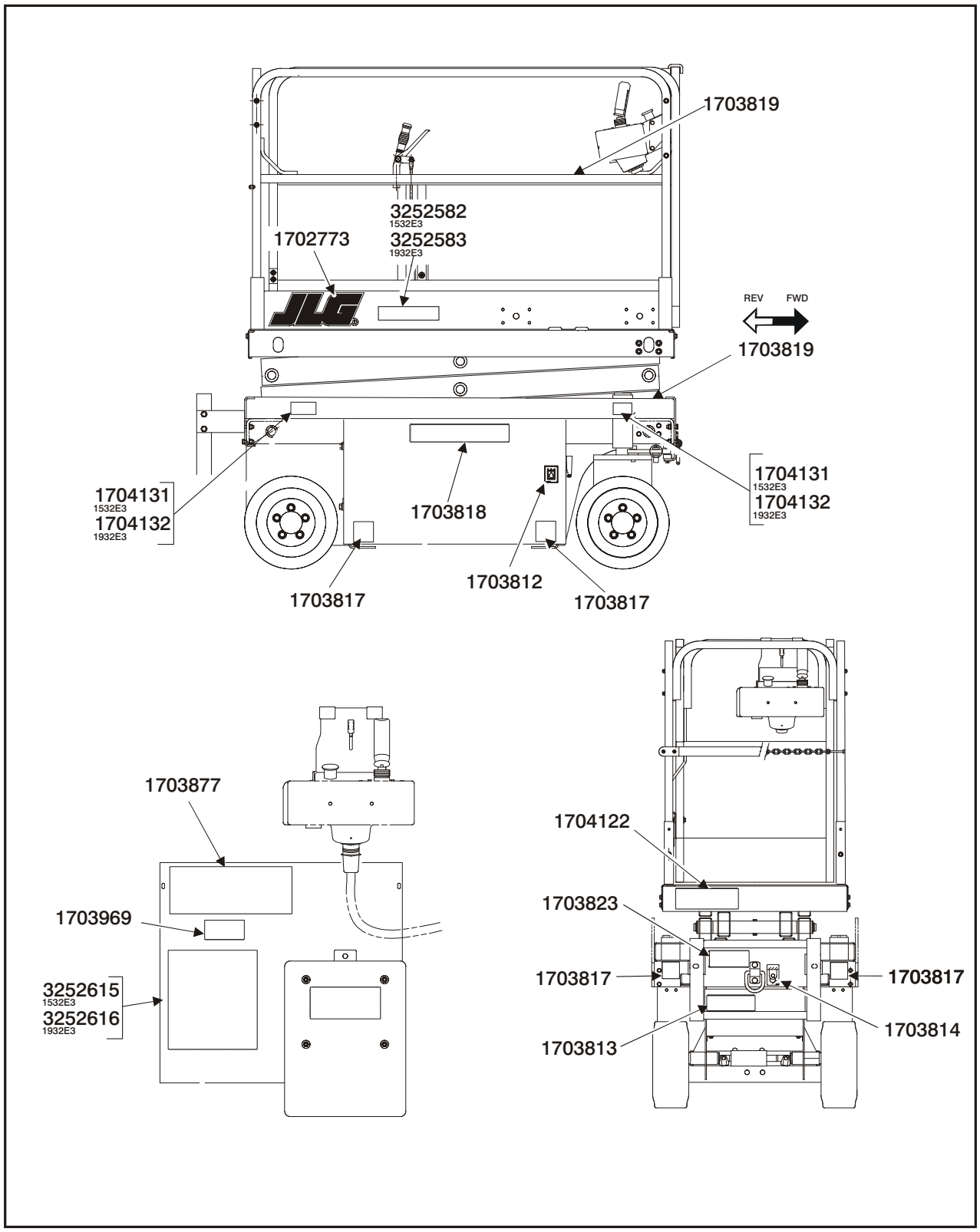

Figure 3-6. Decal Installation - 1532E3 & 1932E3 Australian (Sheet 1 of 2)

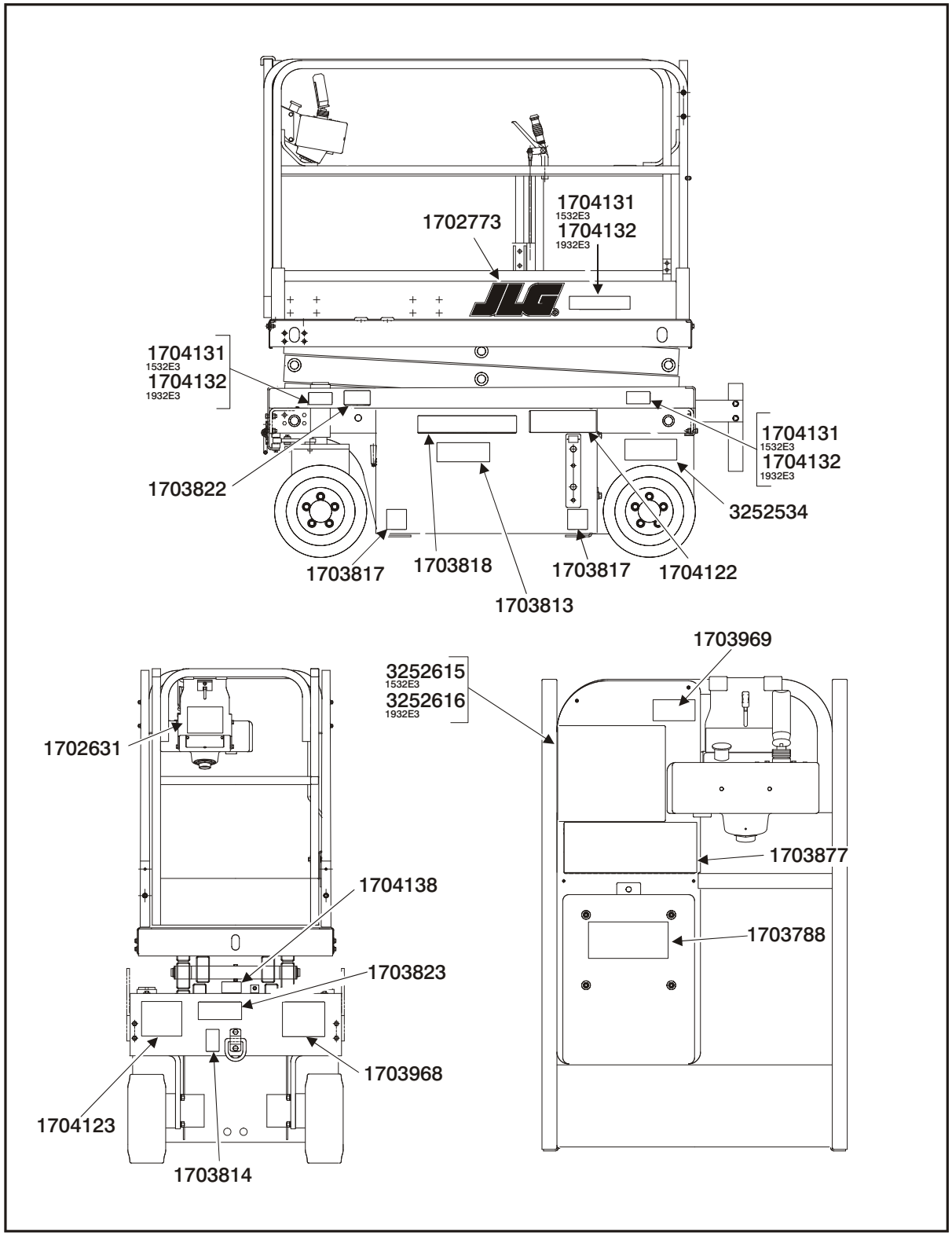

Figure 3-7. Decal Installation - 1532E3 & 1932E3 Australian (Sheet 2 of 2)

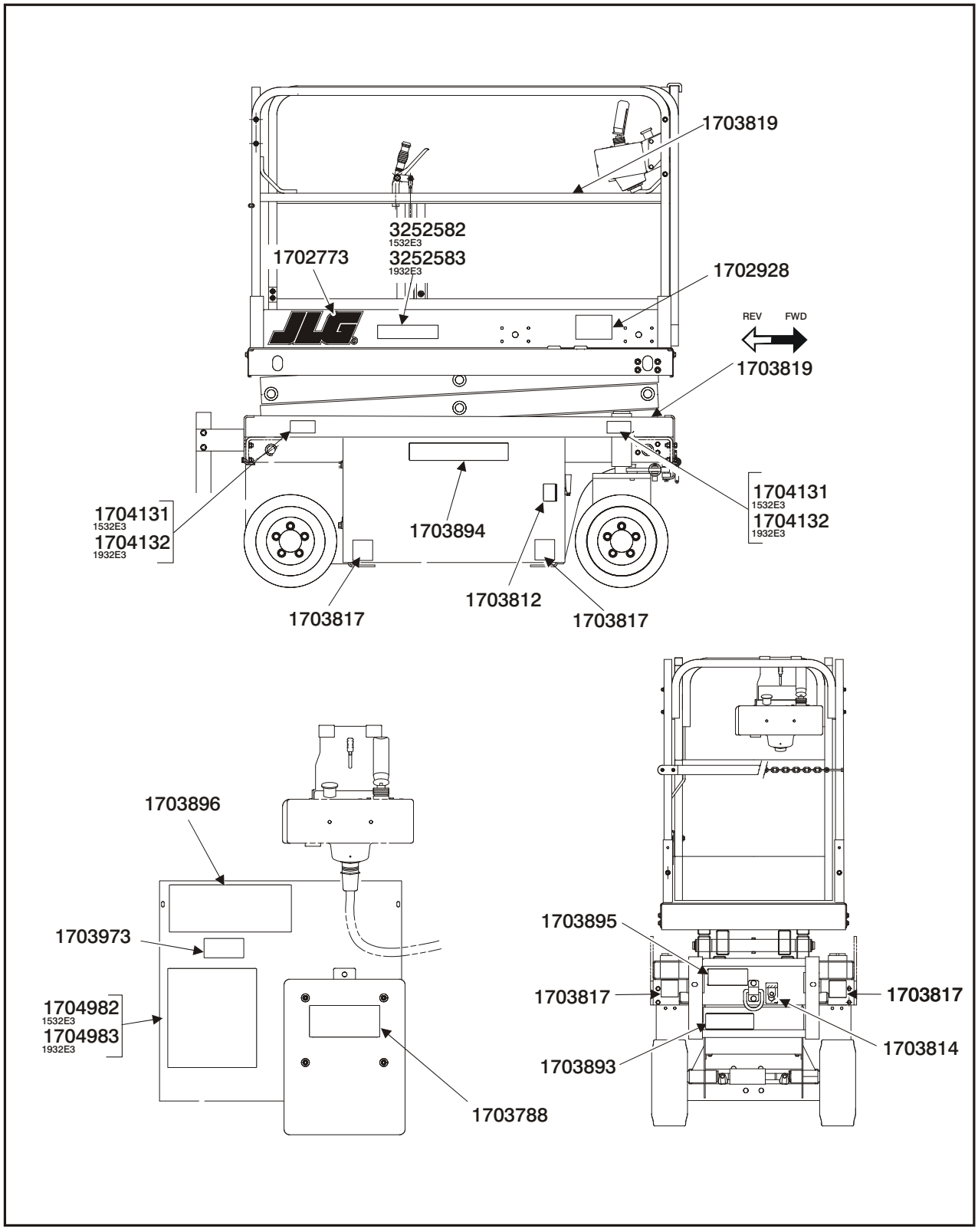

Figure 3-8. Decal Installation - 1532E3 & 1932E3 Dutch (Sheet 1 of 2)

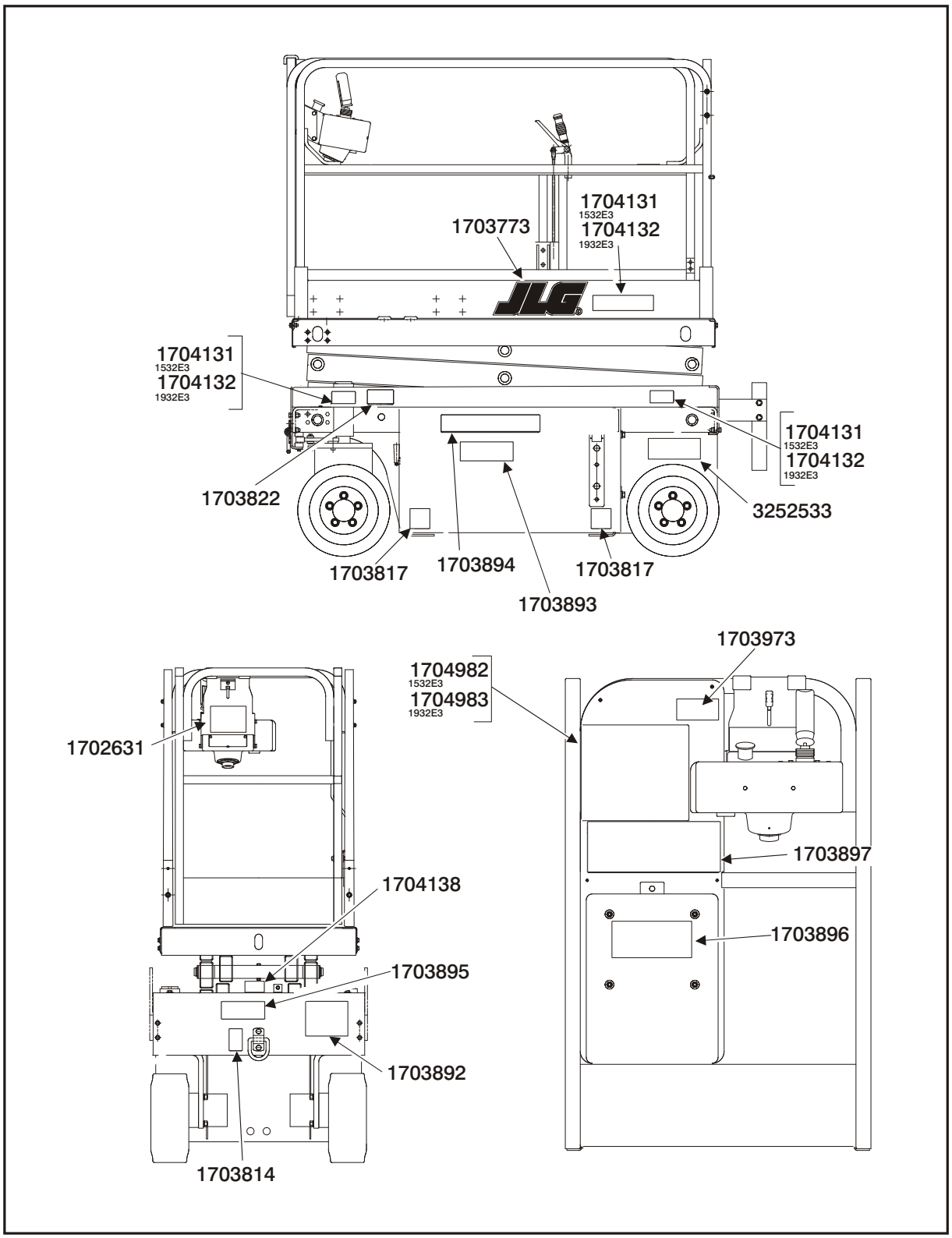

Figure 3-9. Decal Installation - 1532E3 & 1932E3 Dutch (Sheet 2 of 2)

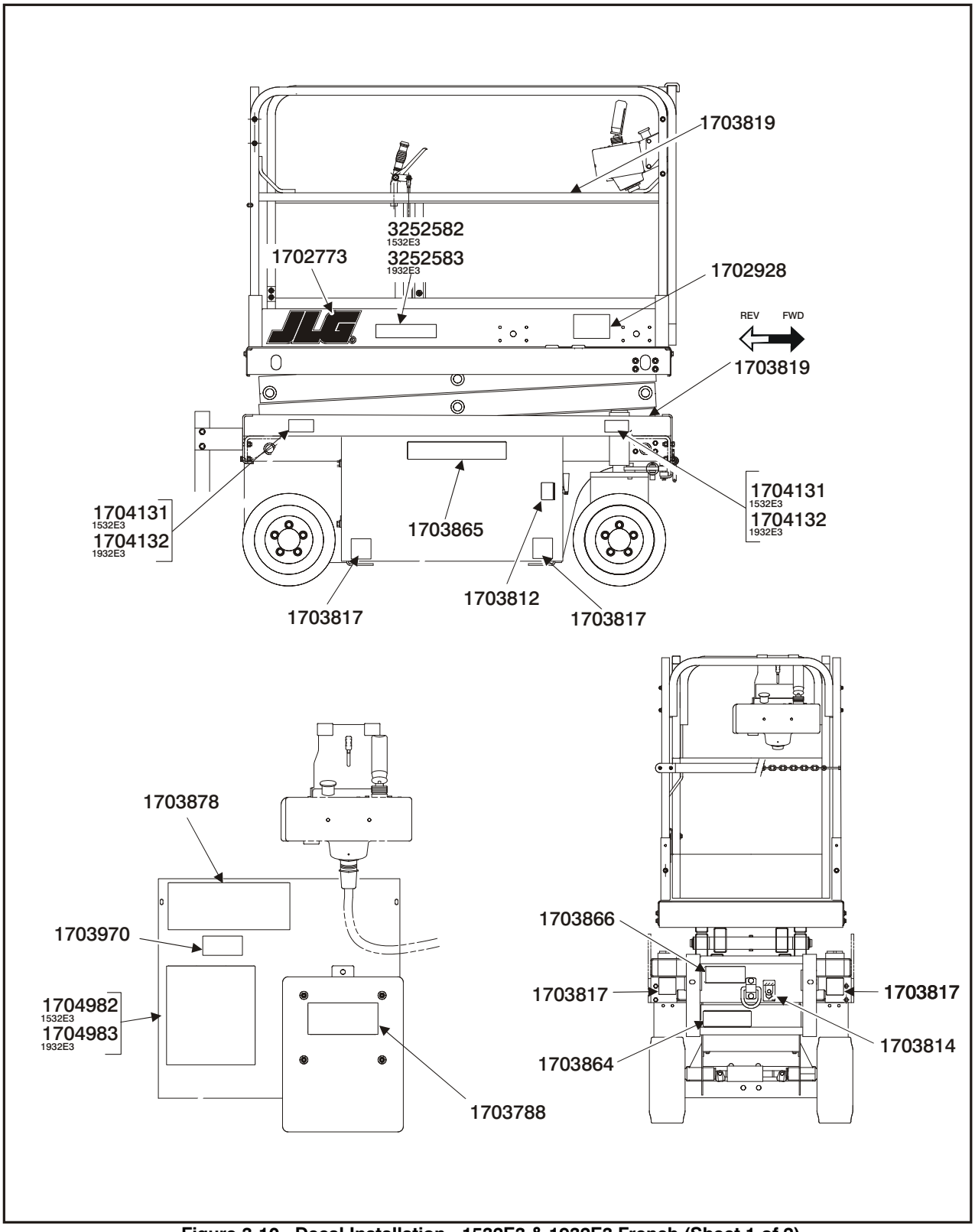

Figure 3-10. Decal Installation - 1532E3 & 1932E3 French (Sheet 1 of 2)

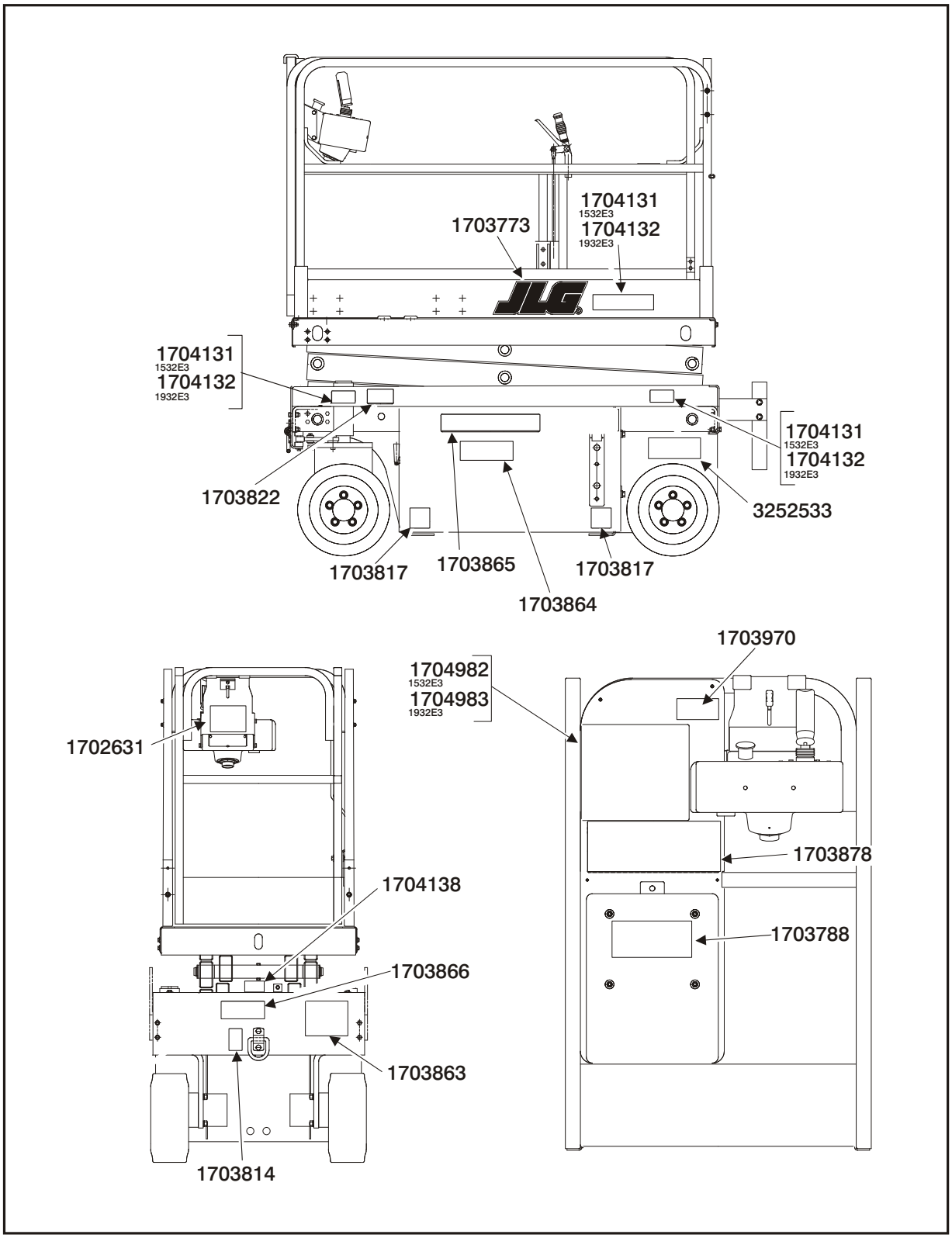

Figure 3-11. Decal Installation - 1532E3 & 1932E3 French (Sheet 2 of 2)

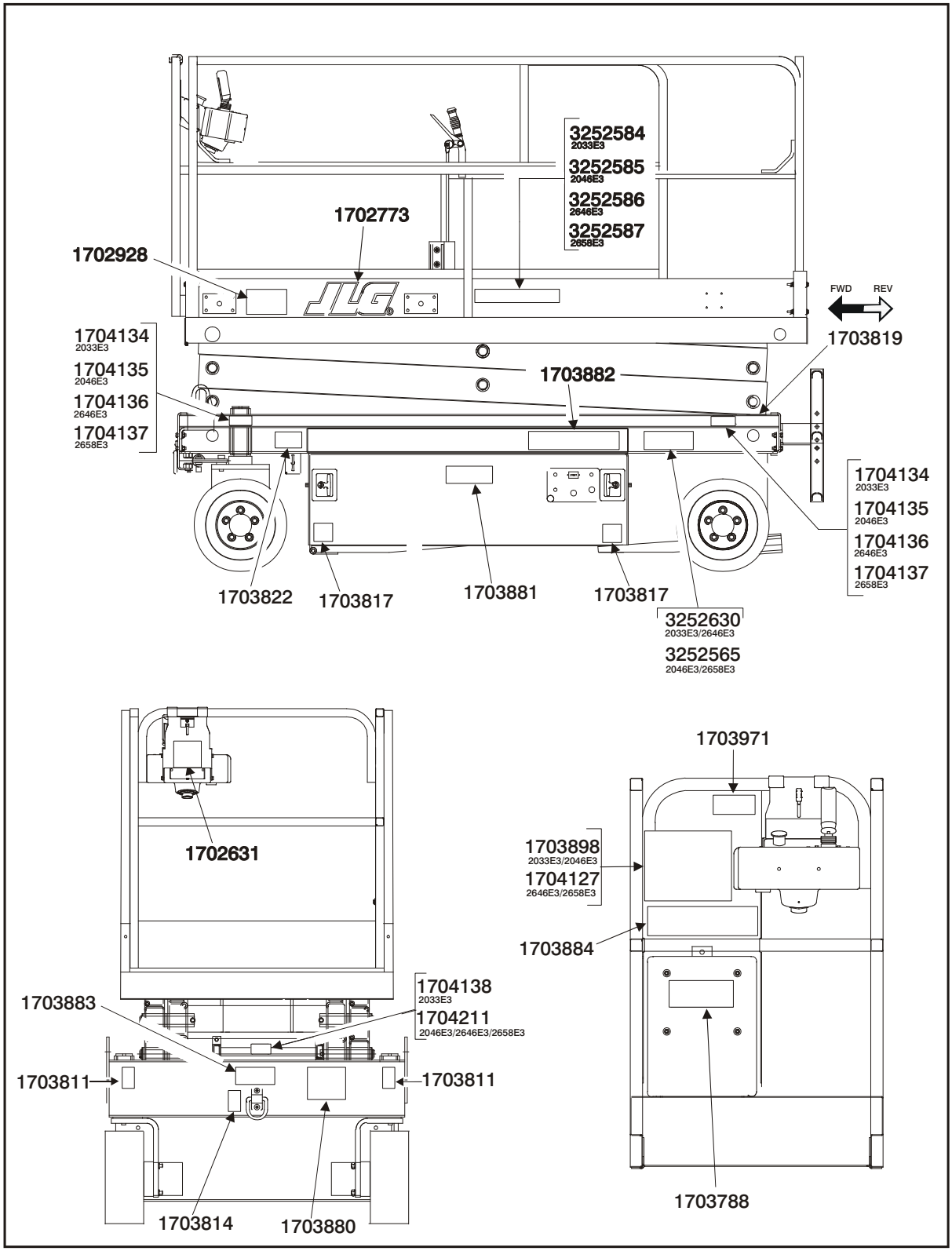

Figure 3-12. Decal Installation - 1532E3 & 1932E3 German (Sheet 1 of 2)

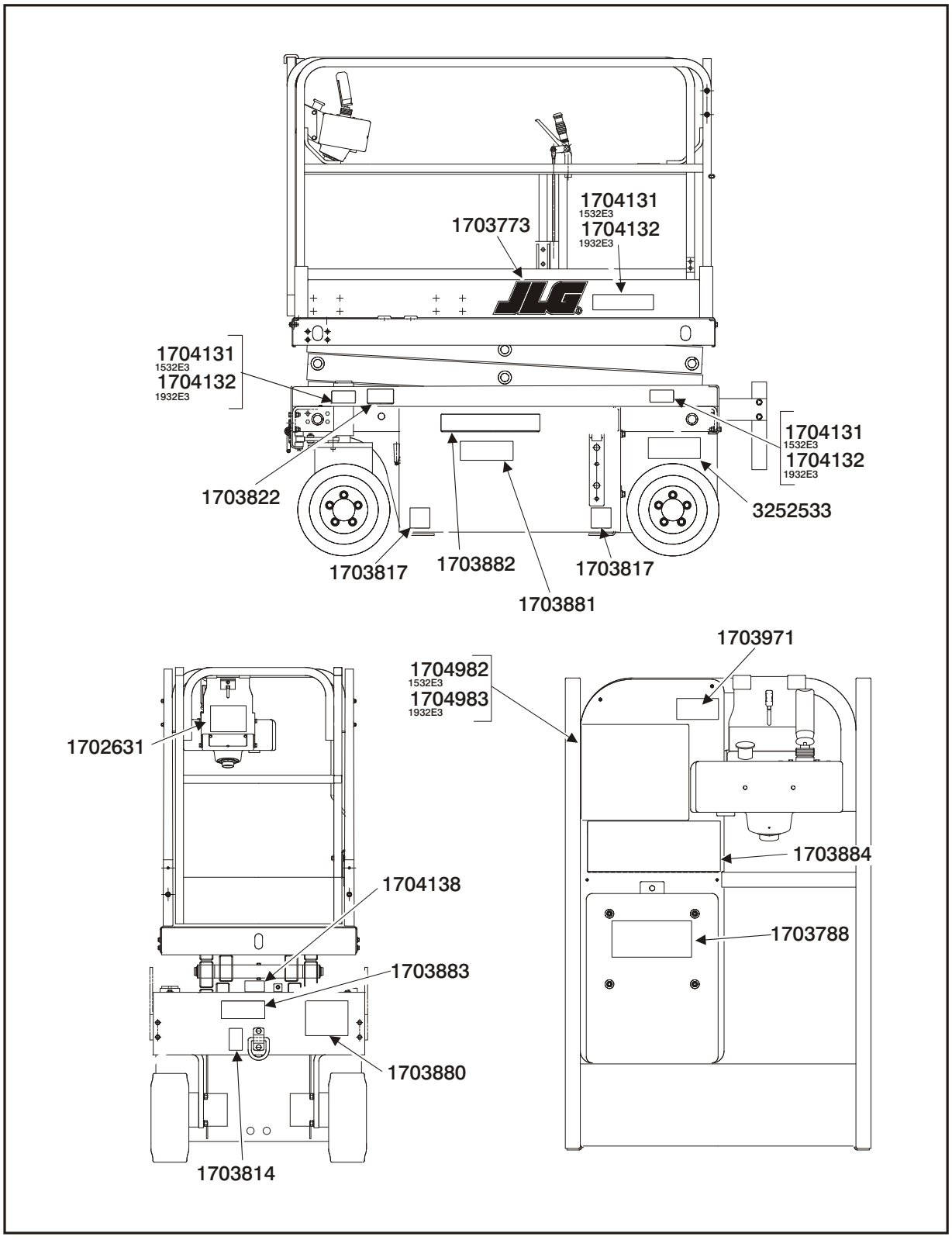

Figure 3-13. Decal Installation - 1532E3 & 1932E3 German (Sheet 2 of 2)

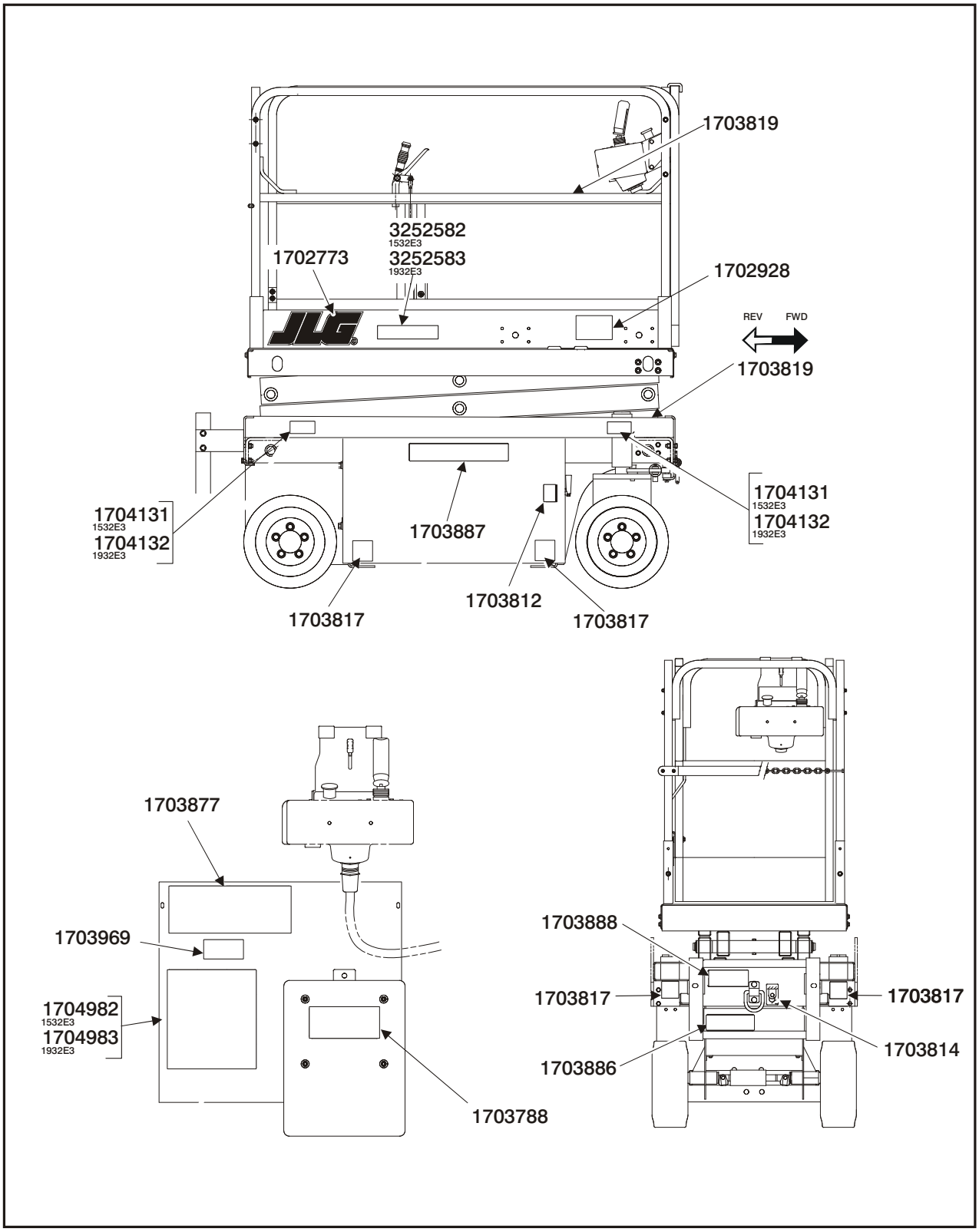

Figure 3-14. Decal Installation - 1532E3 & 1932E3 italian (Sheet 1 of 2)

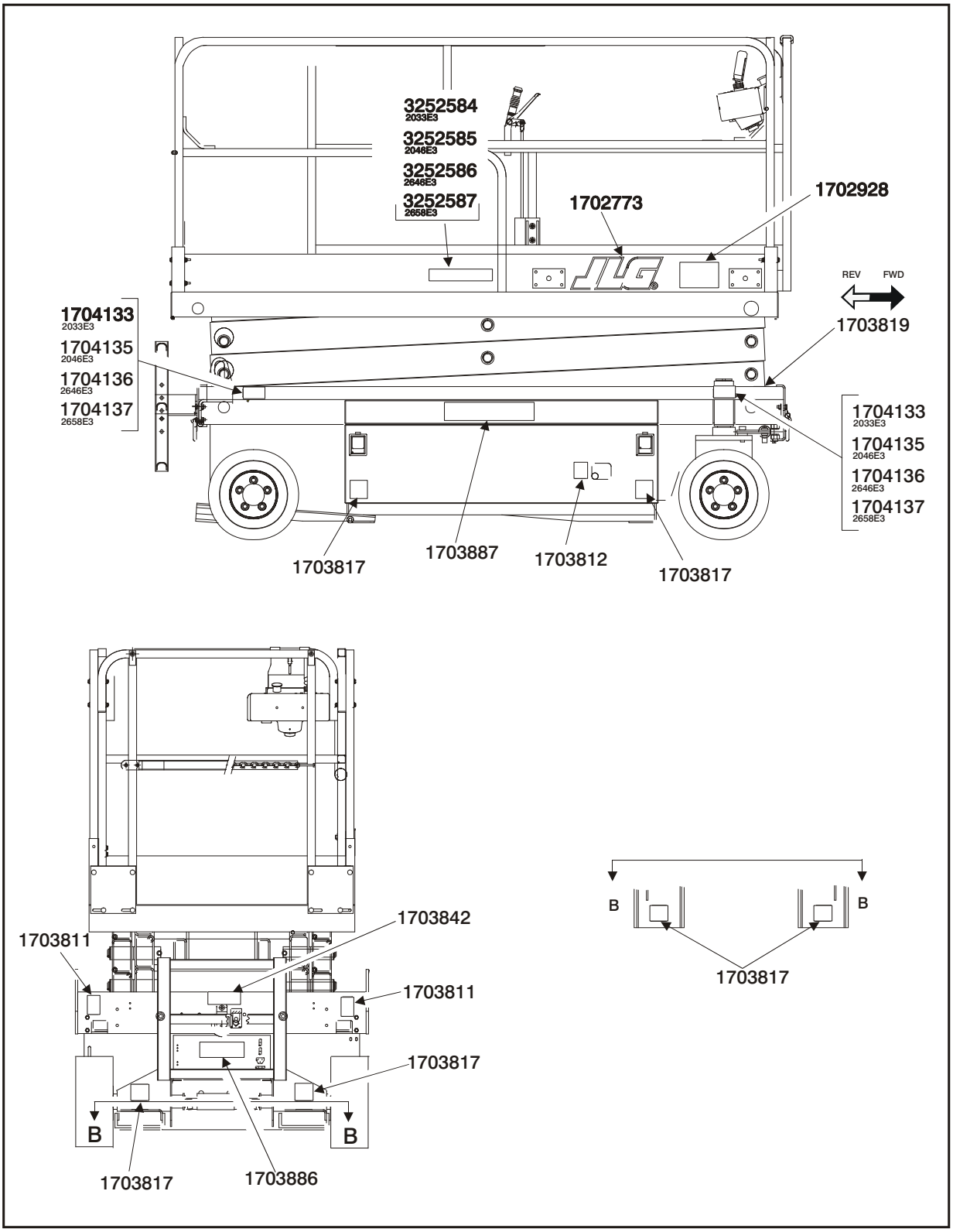

Figure 3-15. Decal Installation - 1532E3 & 1932E3 italian (Sheet 2 of 2)

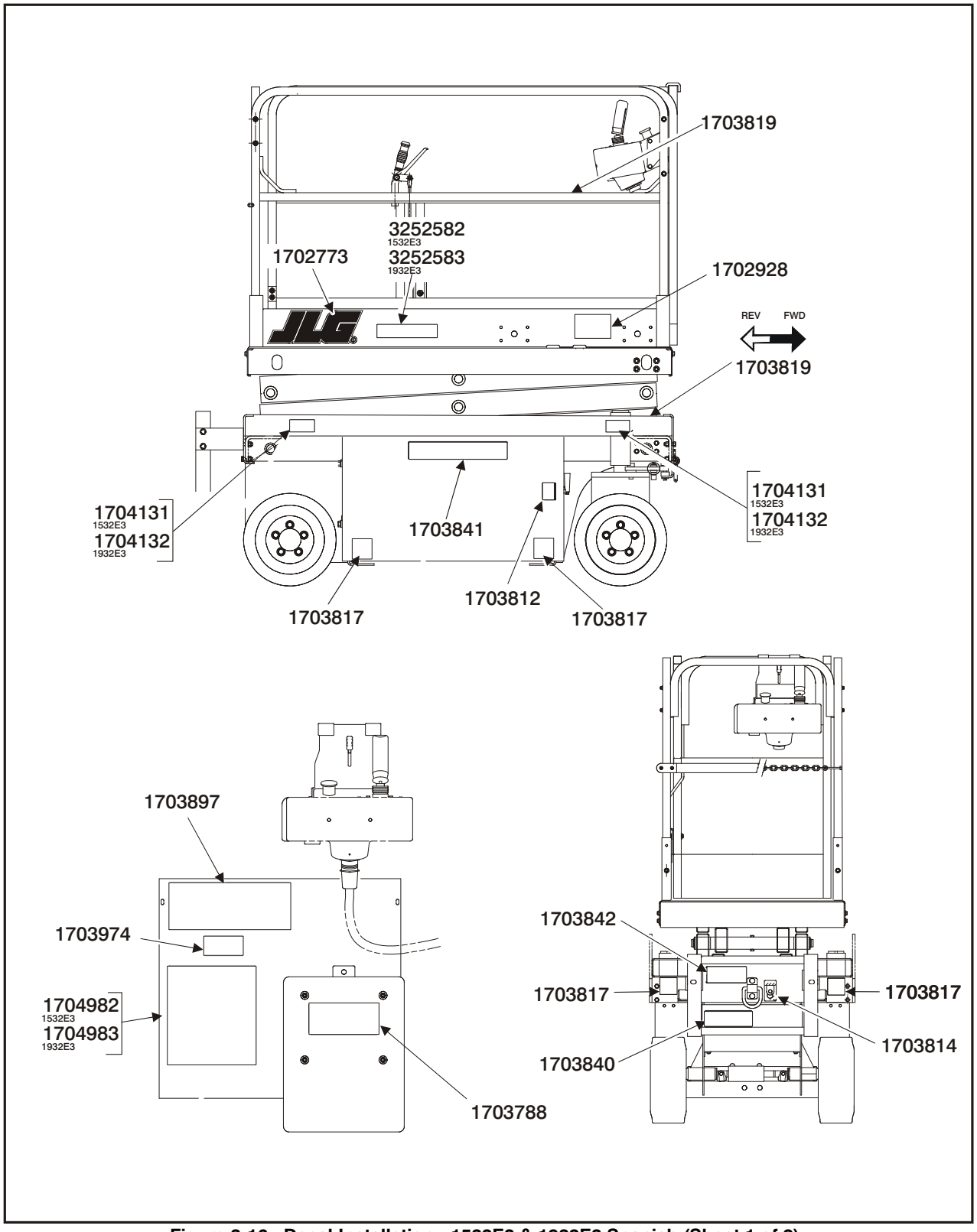

Figure 3-16. Decal Installation - 1532E3 & 1932E3 Spanish (Sheet 1 of 2)

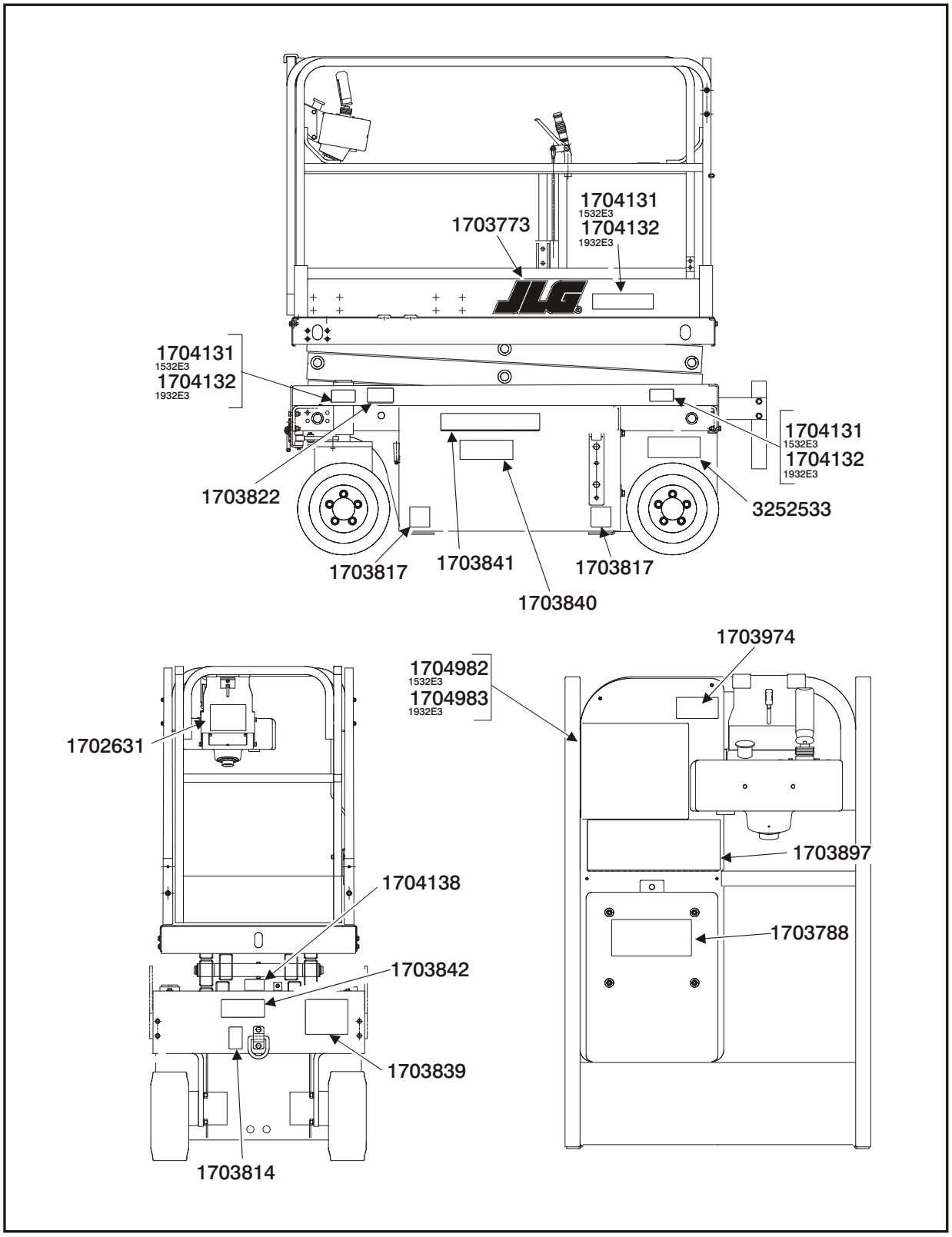

Figure 3-17. Decal Installation - 1532E3 & 1932E3 Spanish (Sheet 2 of 2)

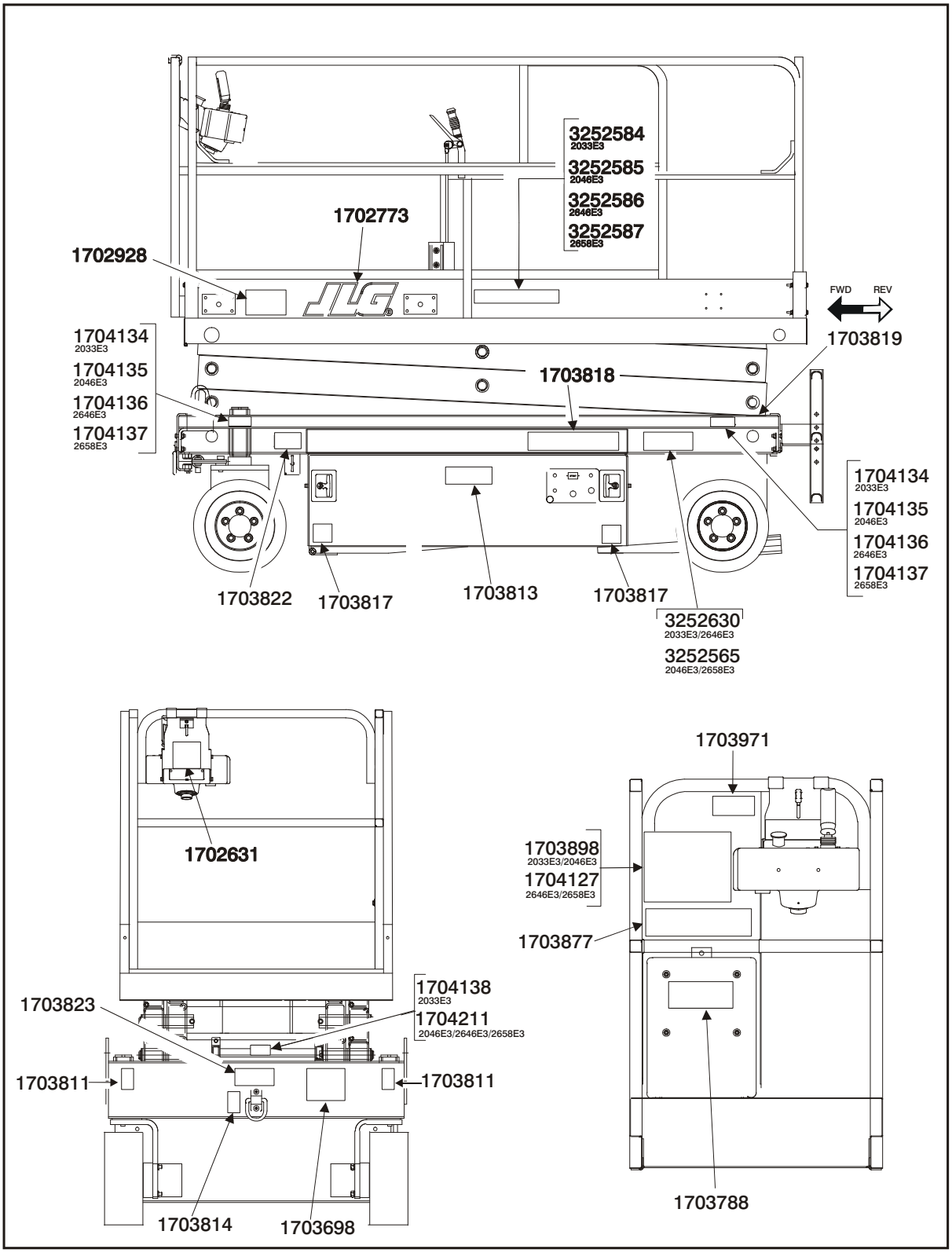

Figure 3-18. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 UK (Sheet 1 of 2)

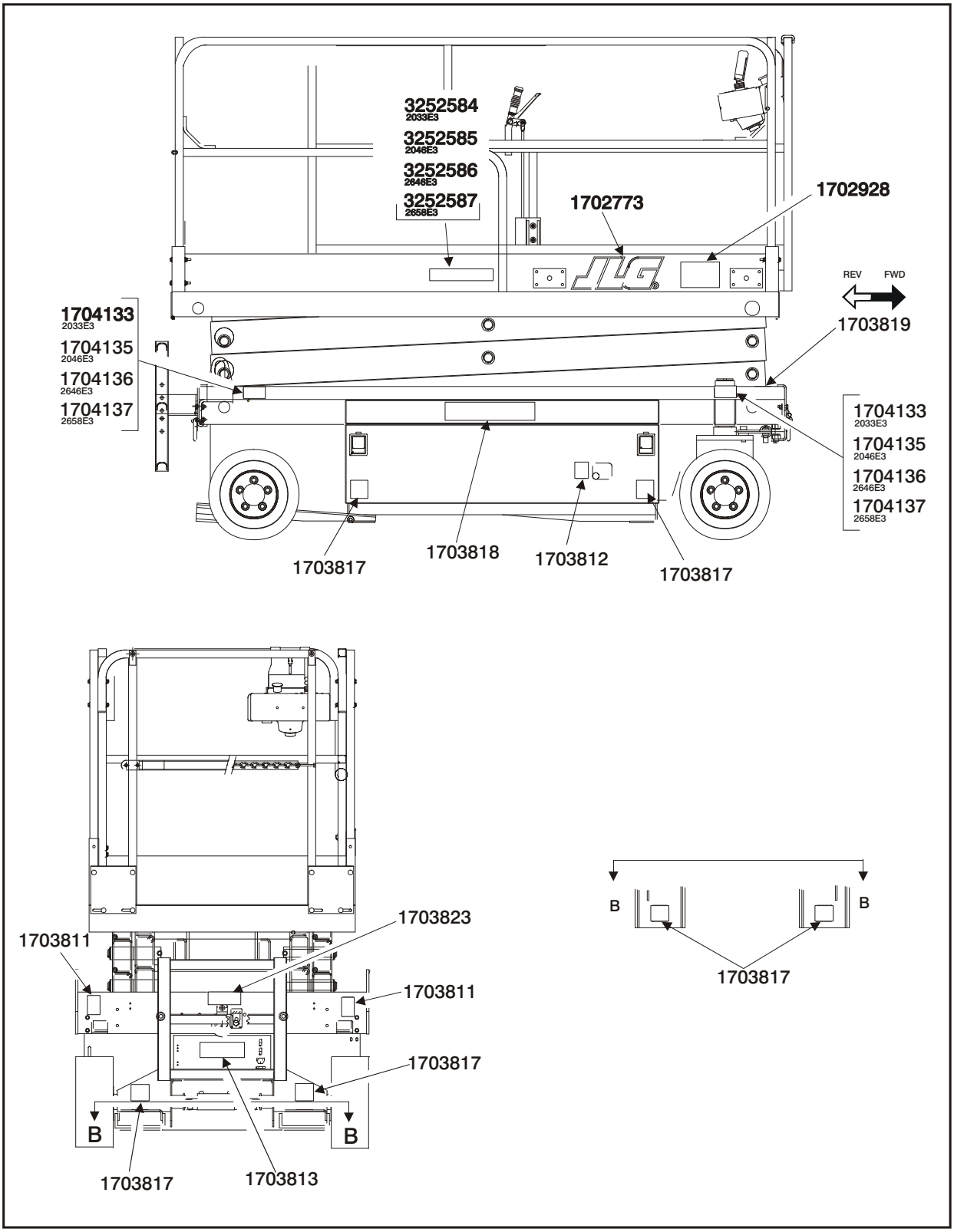

Figure 3-19. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 UK (Sheet 2 of 2)

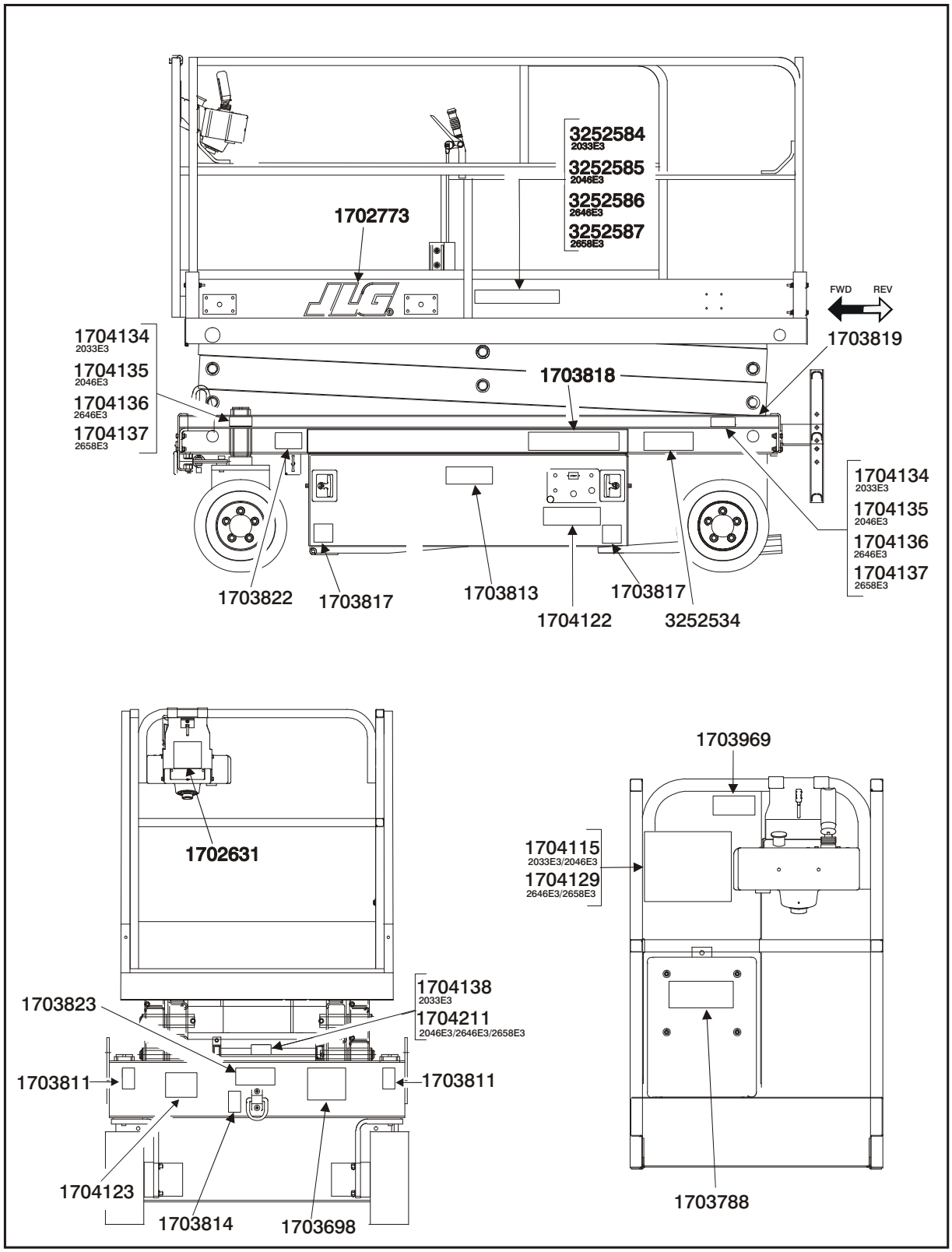

Figure 3-20. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 Australian (Sheet 1 of 2)

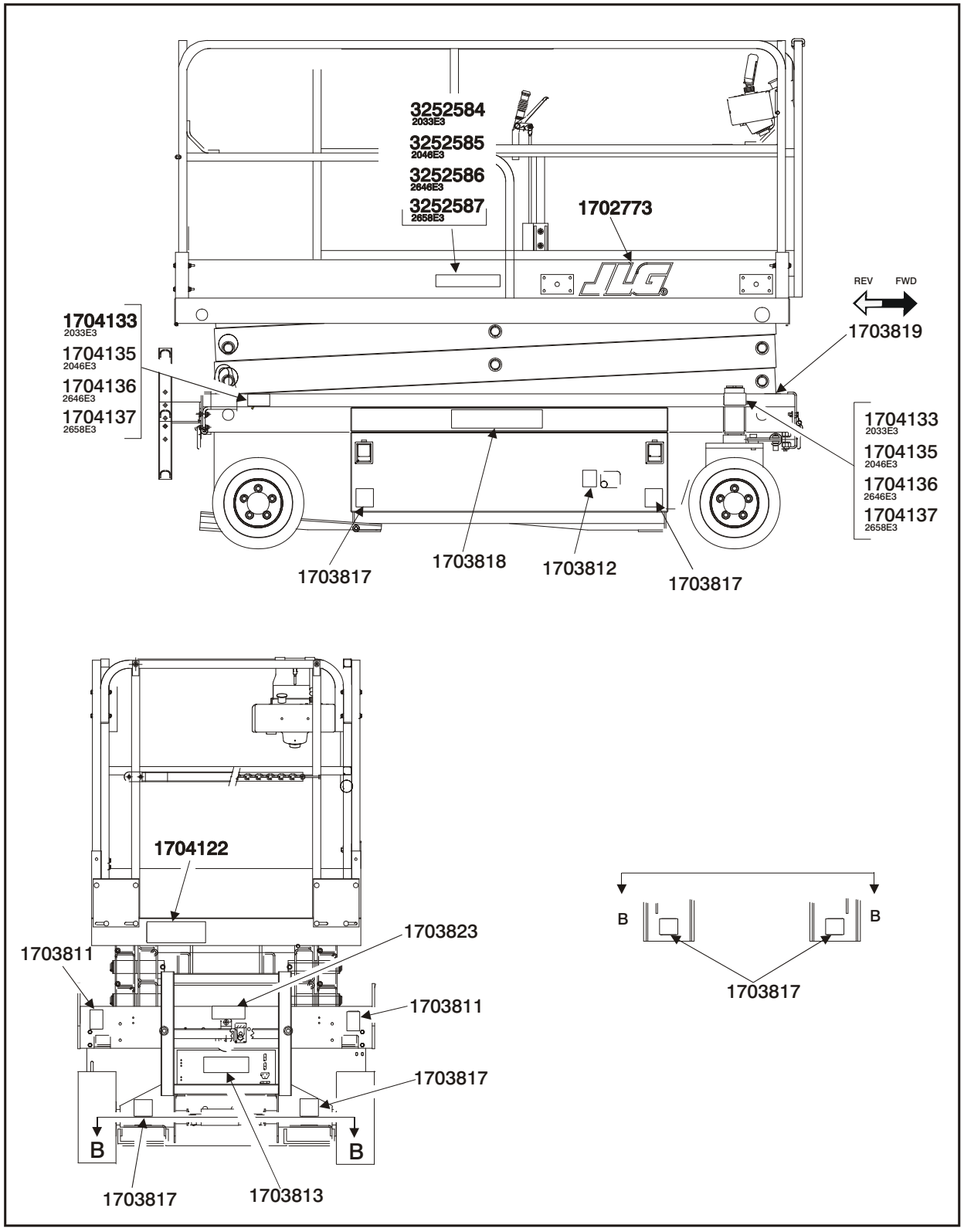

Figure 3-21. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 Australian (Sheet 2 of 2)

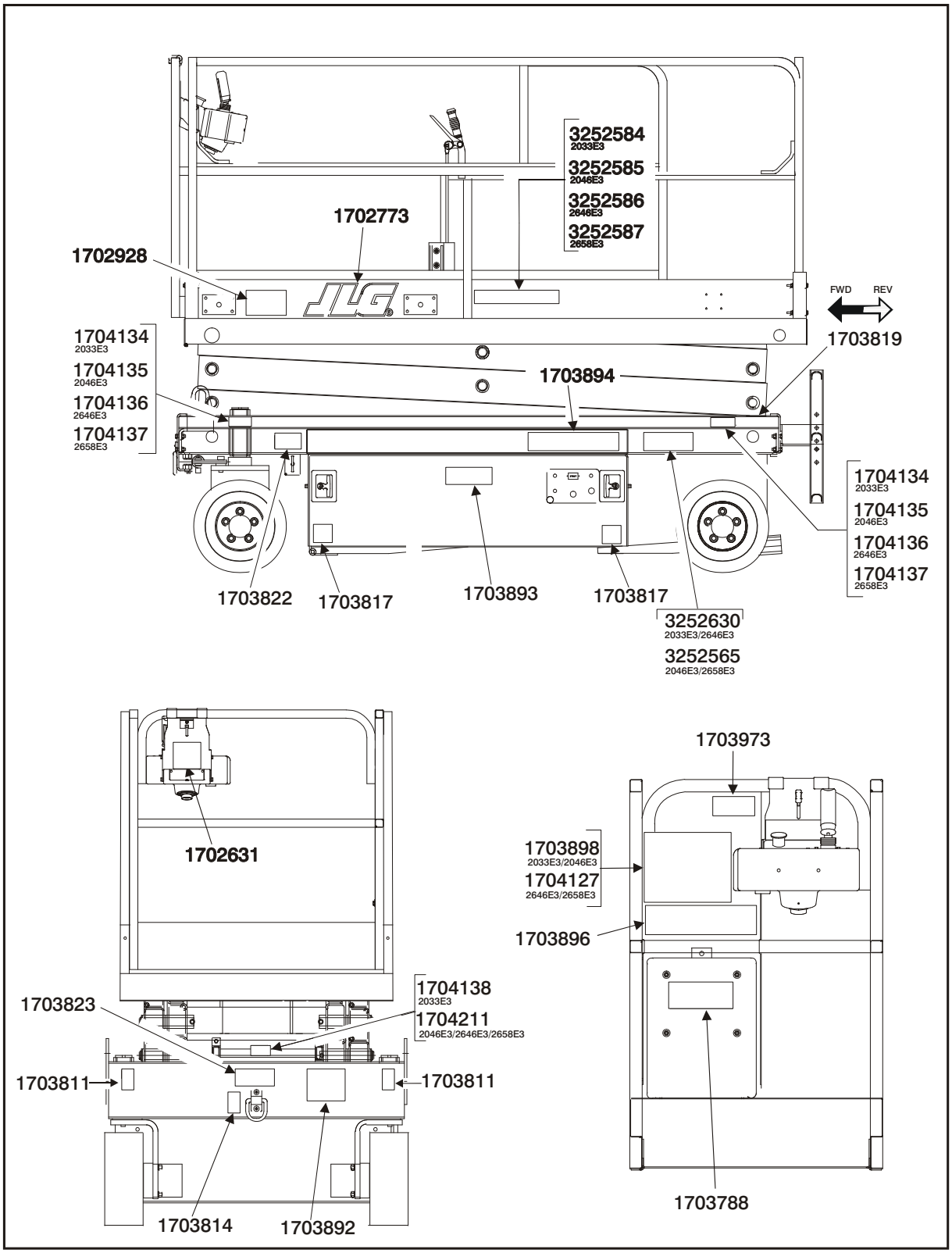

Figure 3-22. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 Dutch (Sheet 1 of 2)

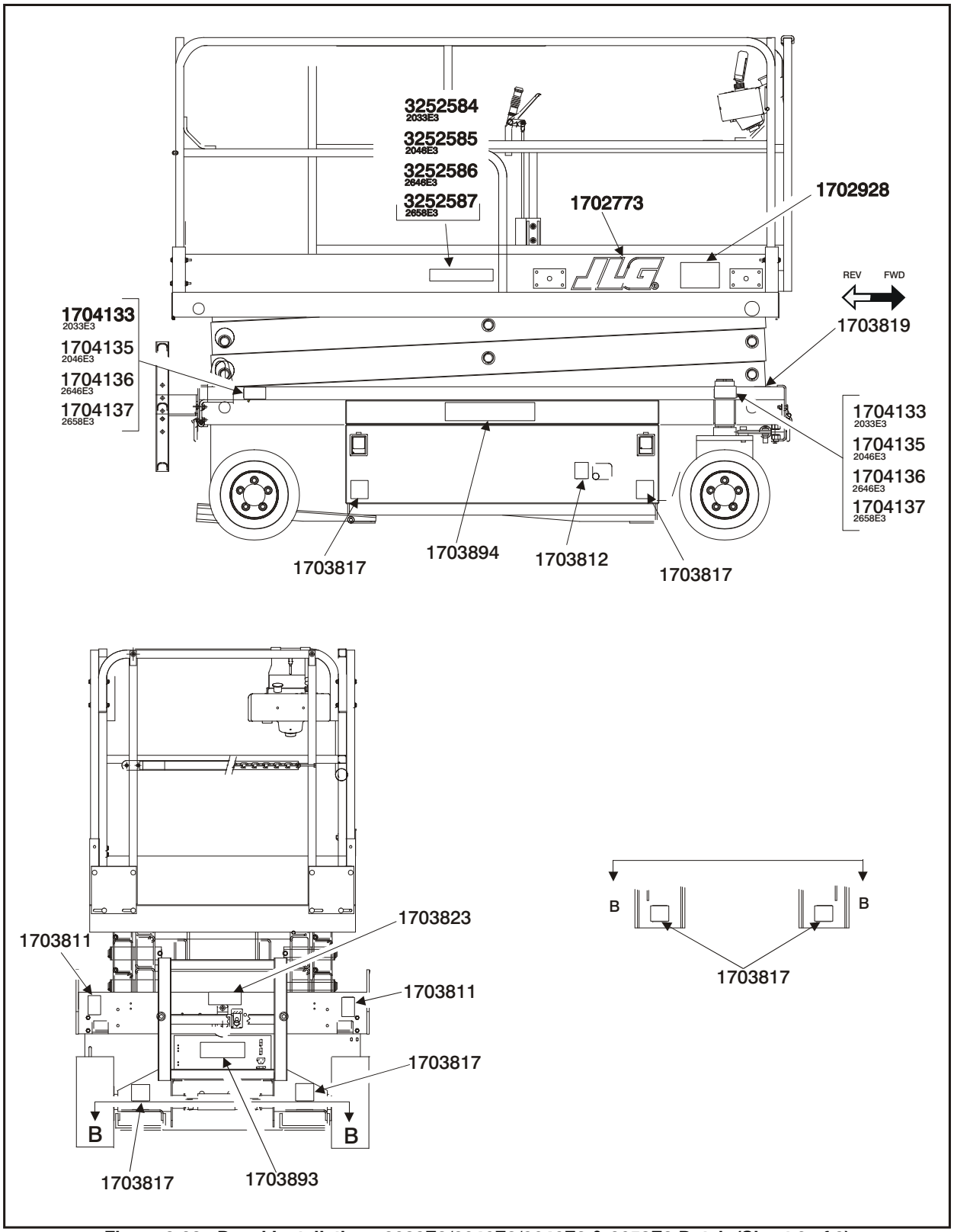

Figure 3-23. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 Dutch (Sheet 2 of 2)

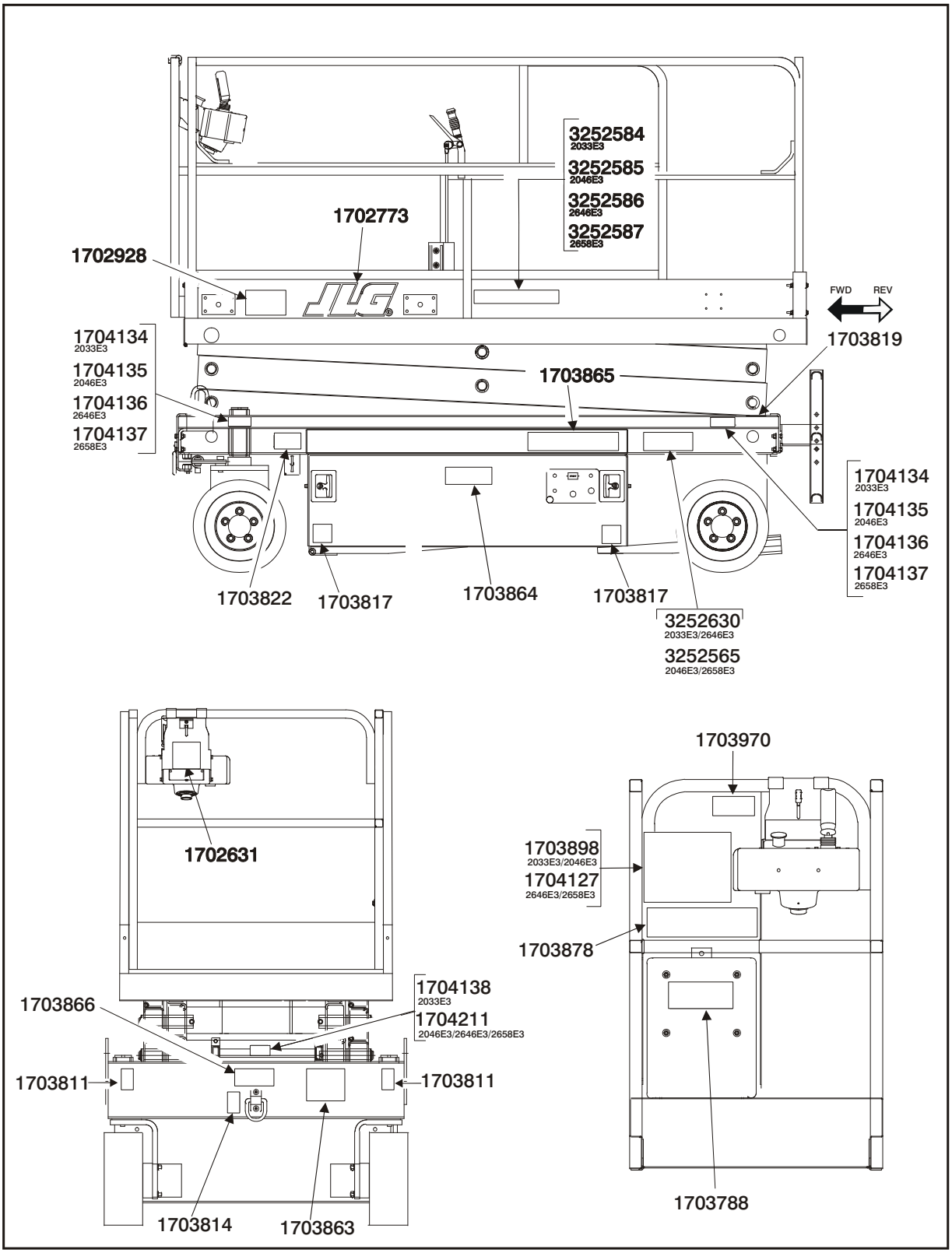

Figure 3-24. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 French (Sheet 1 of 2)

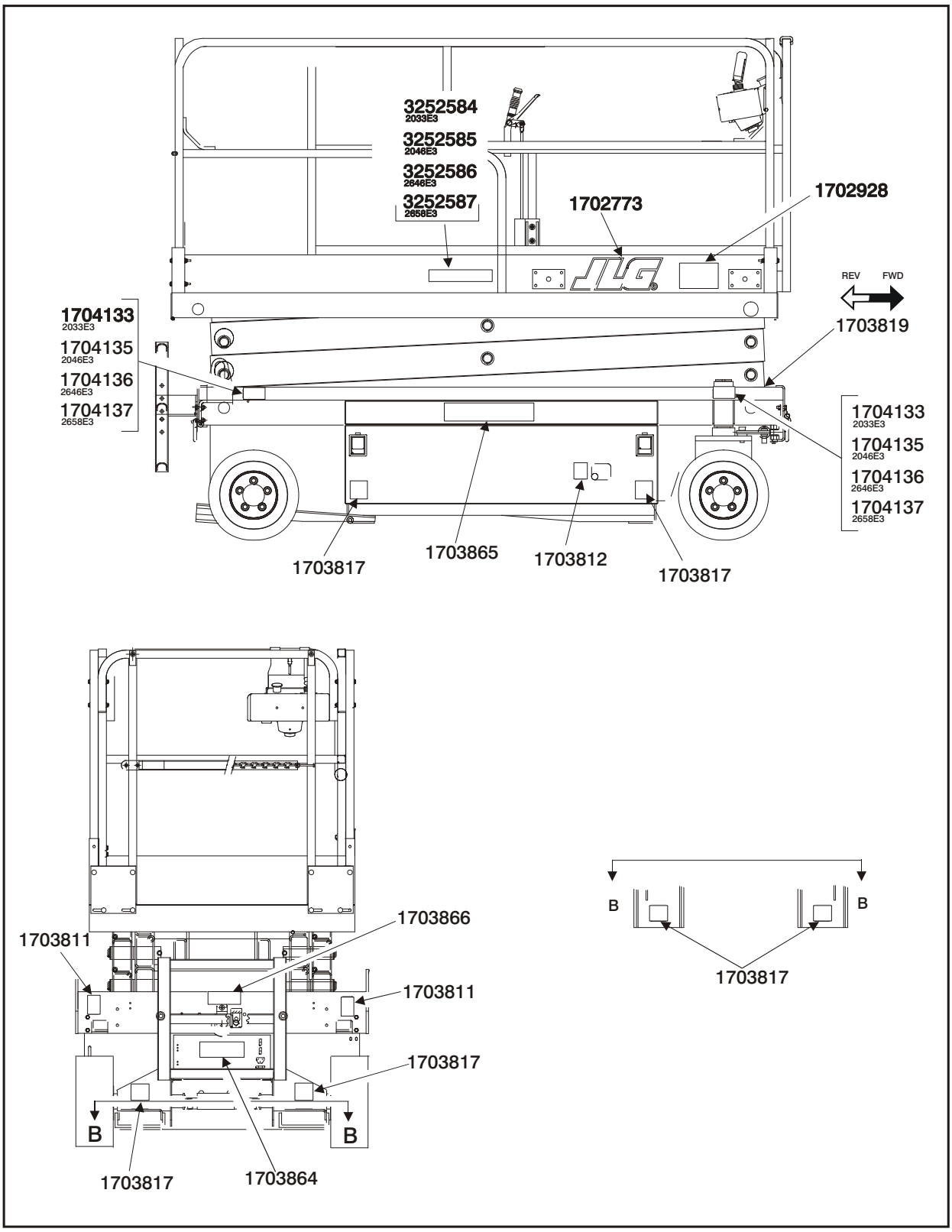

Figure 3-25. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 French (Sheet 2 of 2)

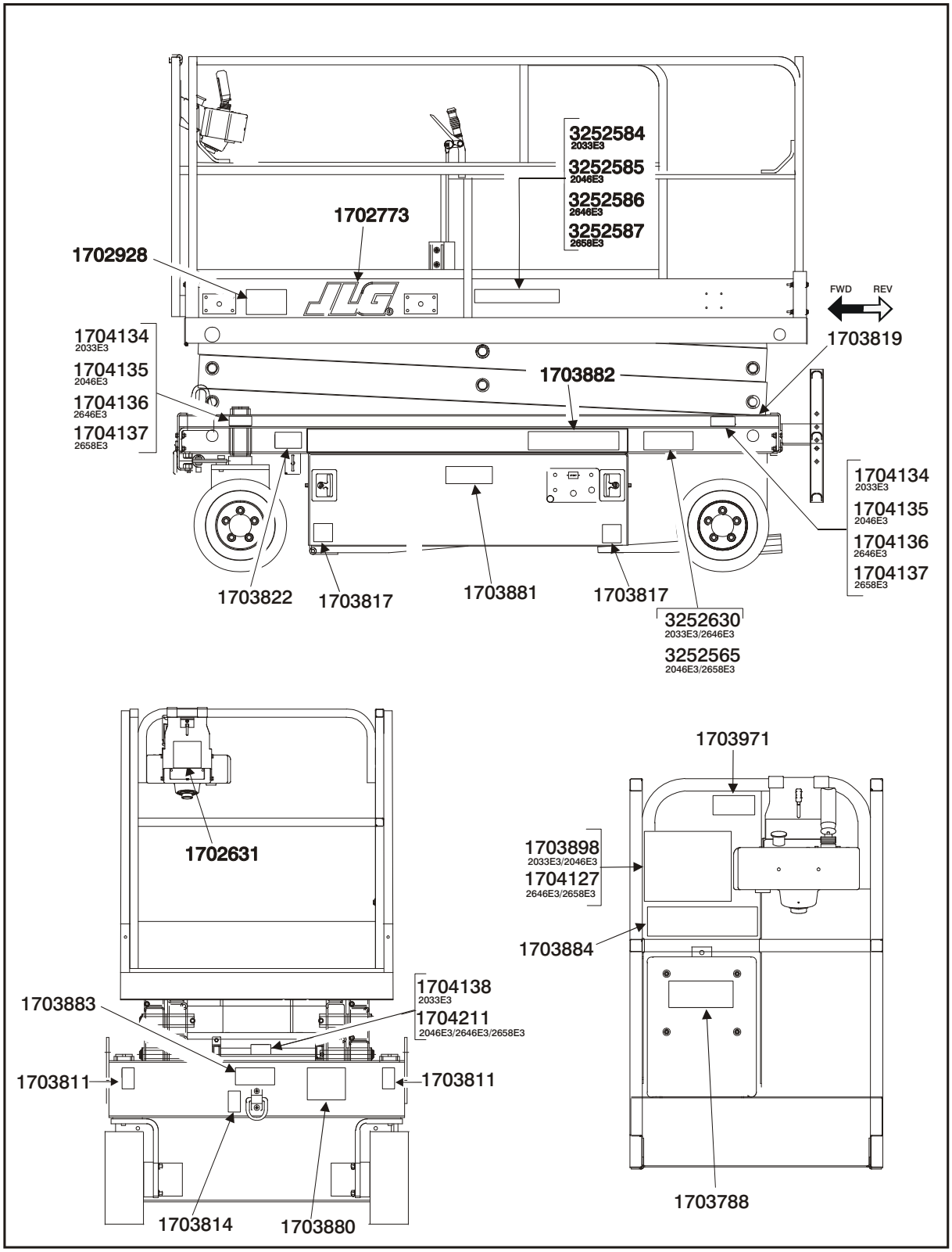

Figure 3-26. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 German (Sheet 1 of 2)

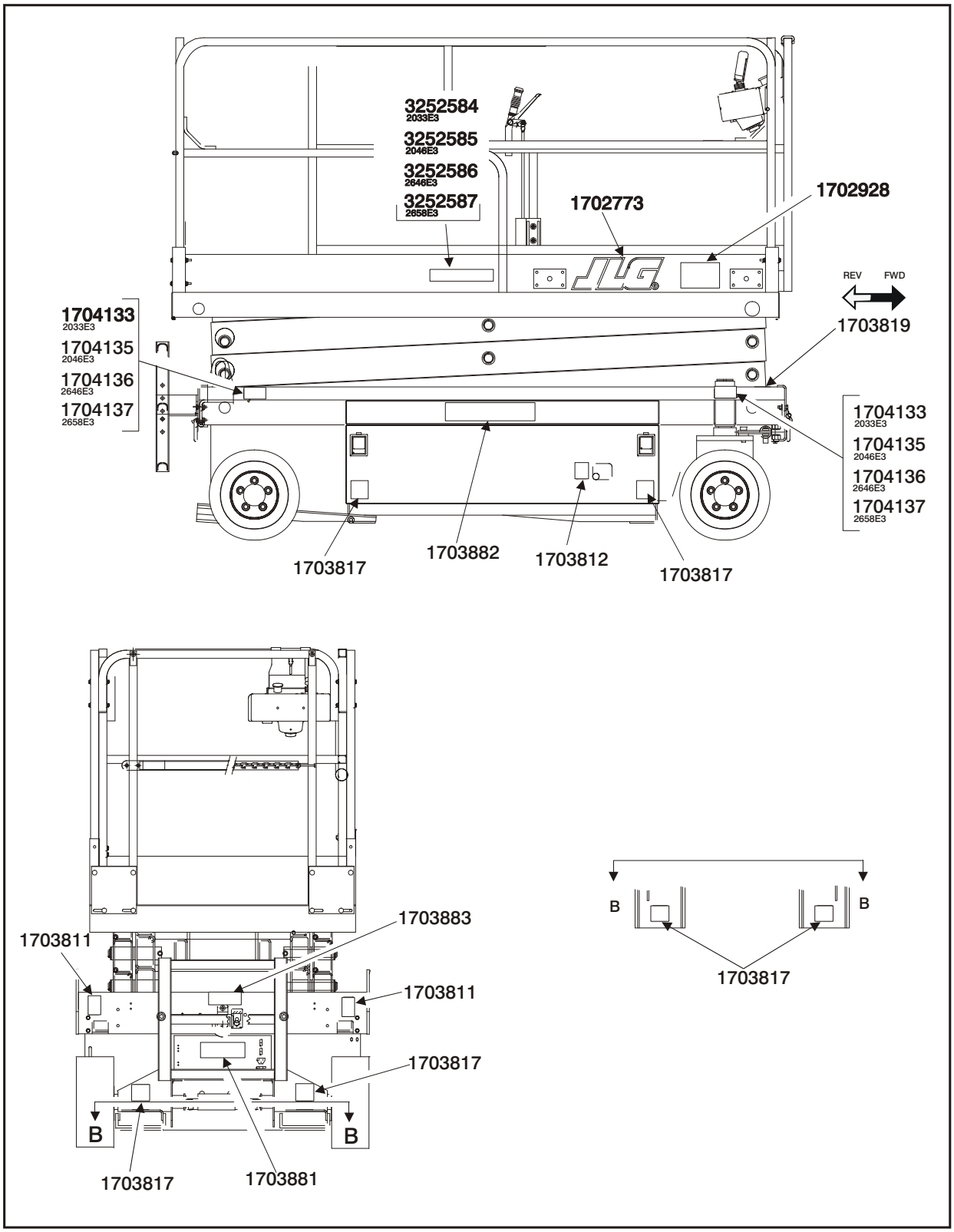

Figure 3-27. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 German (Sheet 2 of 2)

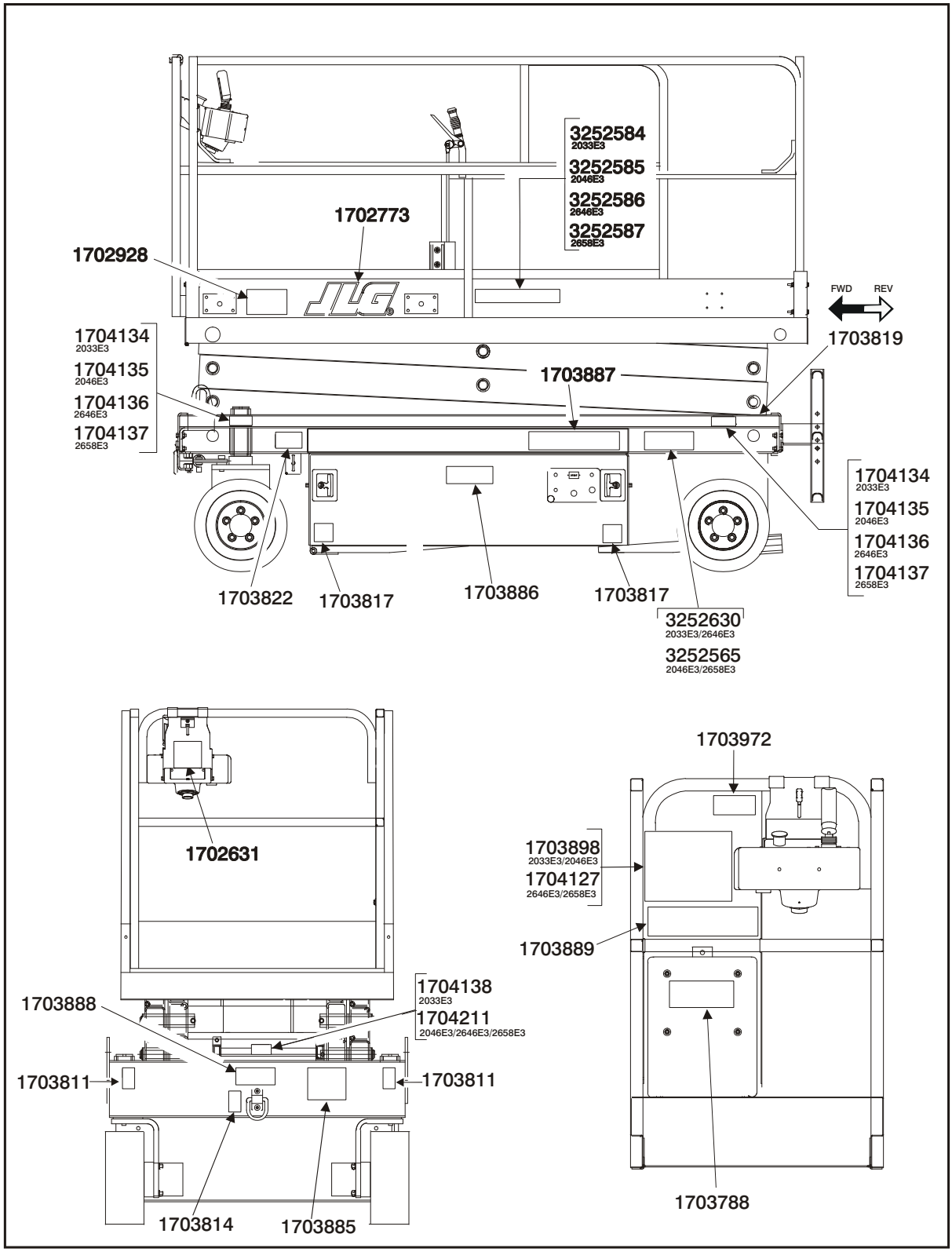

Figure 3-28. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 Italian (Sheet 1 of 2)

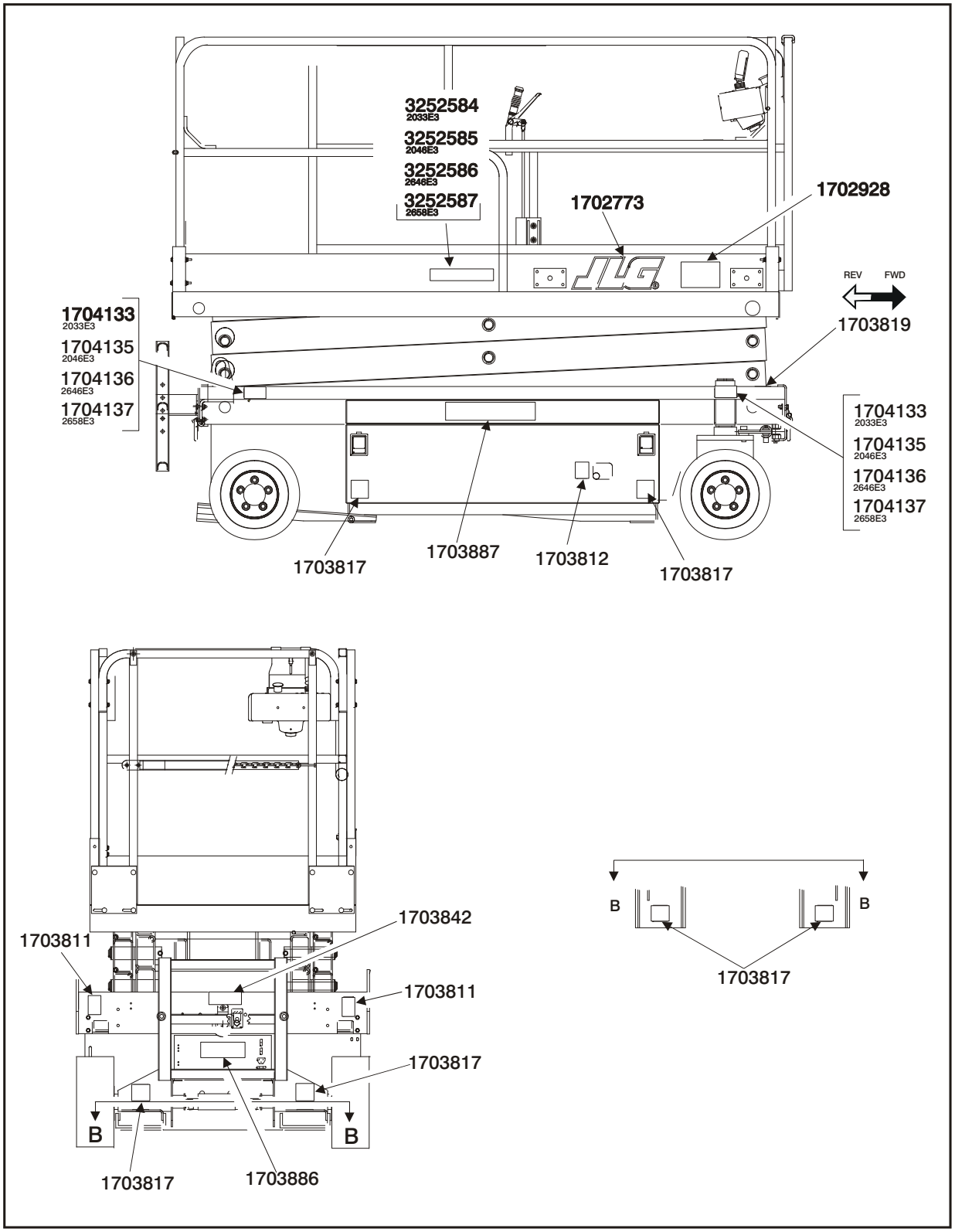

Figure 3-29. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 Italian (Sheet 2 of 2)

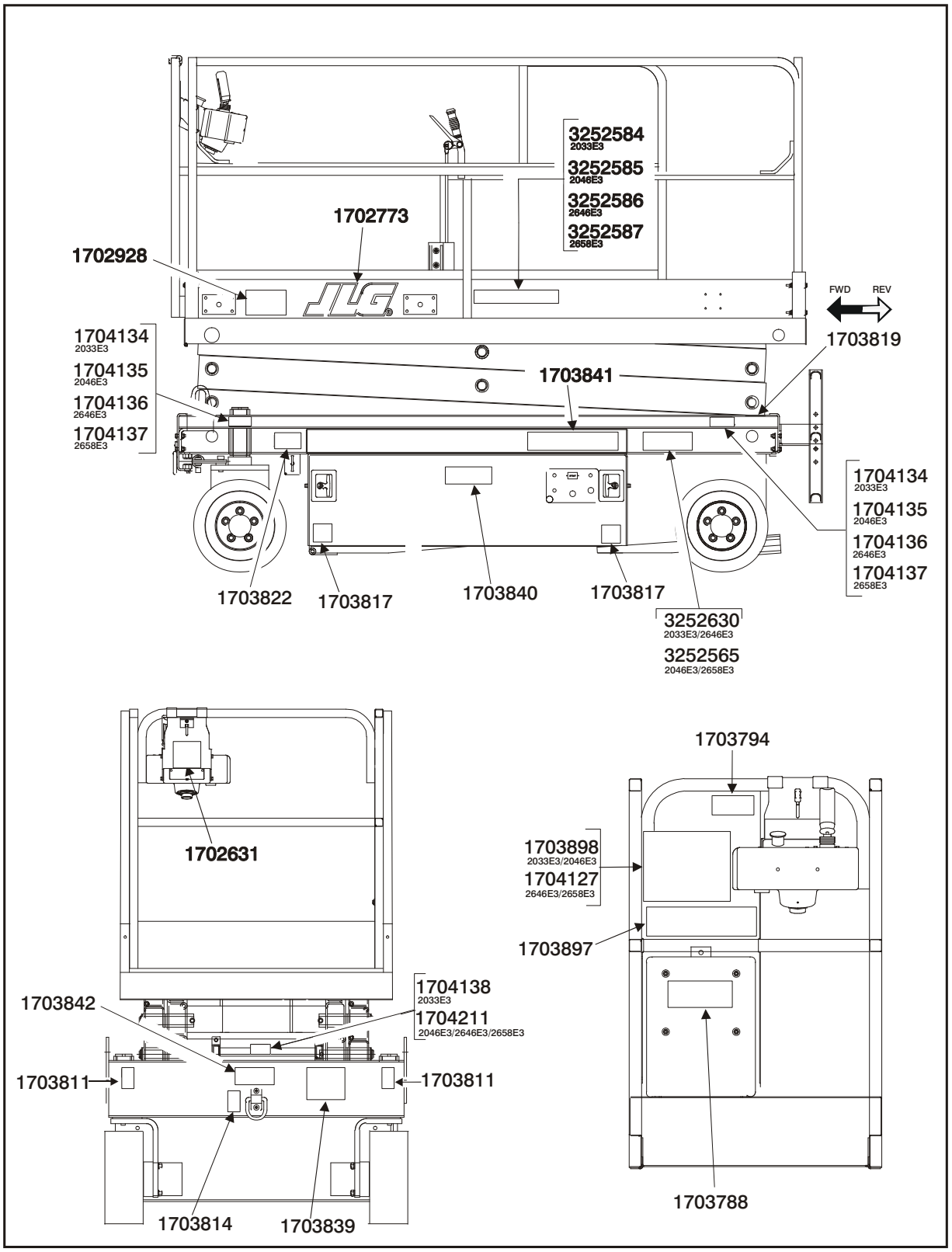

Figure 3-30. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 Spanish (Sheet 1 of 2)

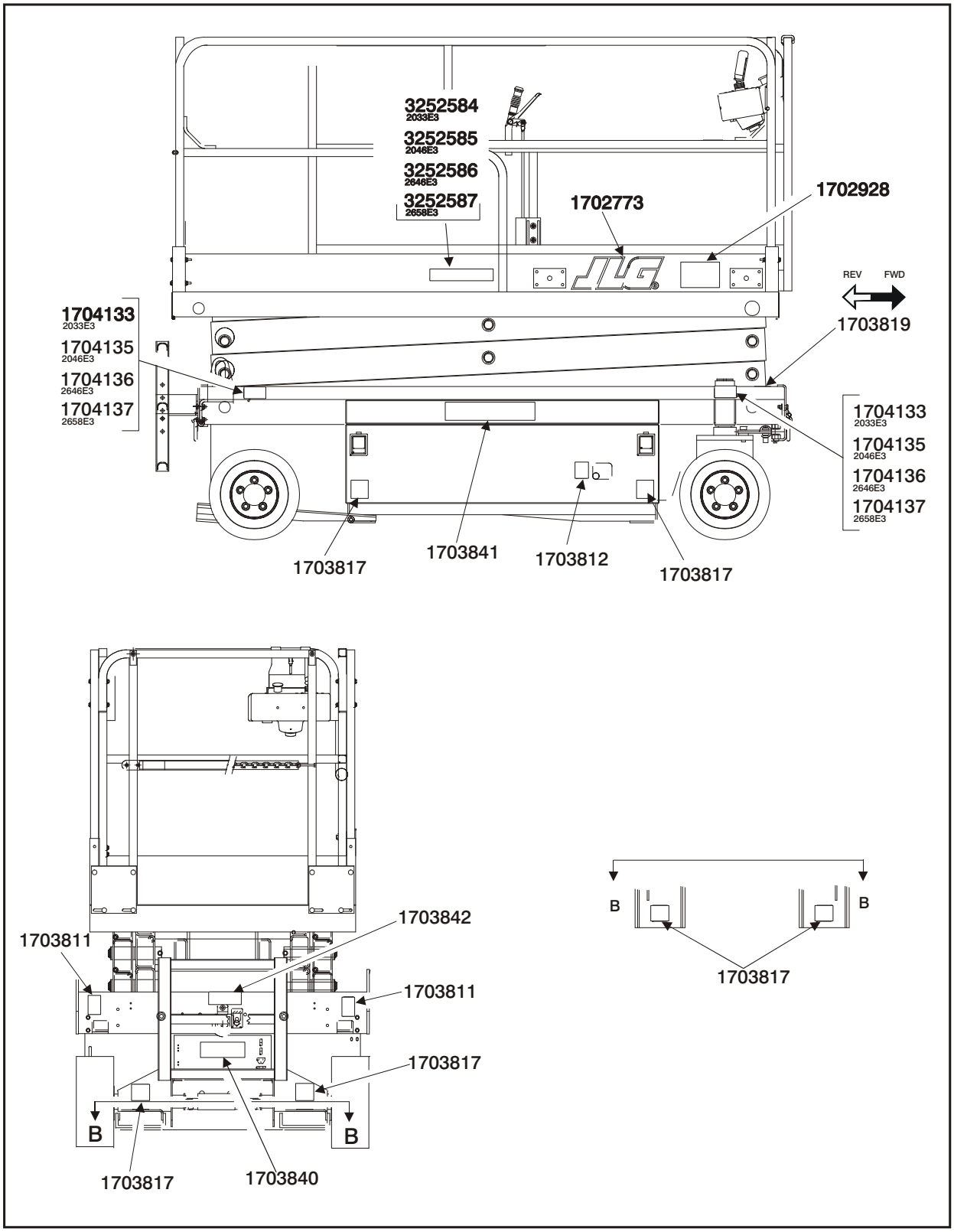

Figure 3-31. Decal Installation - 2033E3/2046E3/2646E3 & 2658E3 Spanish (Sheet 2 of 2)

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SECTION 4. MACHINE OPERATION

4.1 DESCRIPTION

This machine is a self-propelled aerial work platform on top of an elevating scissor mechanism. The Scissor Lifts intended purpose is to position personnel with their tools and supplies at positions above ground level. The machine can be used to reach work areas located above machinery or equipment positioned at ground level.

The JLG Scissor Lift has a primary operator Control Station in the platform. From this Control Station, the operator can drive and steer the machine in both forward and reverse directions, raise and lower the platform and, if equipped, operate the powered deck extension. The machine has a Ground Control Station which will override the Platform Control Station. Ground Controls operate lift up and down. Ground Controls are to be used only in an emergency to lower the platform to the ground should the operator in the platform be unable to do so. Vibrations emitted by these machines are not hazardous to an operator in the work platform. The equivalent continuous A-Weighted sound pressure level at the work platform is less than 70 dB(A).

Instructions and hazard warnings are posted adjacent to both operator control stations and at other places on the machine. It is extremely important that operators know what instructions and warnings are placed on the machine, and review these periodically so that they are fresh in their minds.

The JLG Scissor Lift is designed to provide efficient and safe operation when maintained and operated in accordance with warnings on the machine, the Operating and Safety Manual, the Service and Maintenance Manual and all jobsite and government rules and regulations. As with any type of machinery, the operator is very important to efficient and safe operation. It is absolutely necessary that the JLG Lift be regularly maintained in accordance with this manual and the machine Service and Maintenance Manual, and that any evidence of lack of maintenance, malfunction, excessive wear, damage or modification to the machine be reported immediately to the machine owner or the jobsite supervisor or safety manager and that the machine be taken out of service until all discrepancies are corrected.

The JLG Scissor Lift is not intended to be used to lift material other than supplies which personnel in the platform require to do their job. Supplies or tools which extend outside the platform are prohibited. It must not be used as a forklift, crane, support for overhead structure, or to push or pull another object.

The JLG Scissor Lift is powered using hydraulic motors and cylinders for the various machine motions. The hydraulic components are controlled by electrically activated hydraulic valves using switches and control levers. The speeds of functions controlled by control levers are variable from zero to maximum speed, depending upon the position of the control lever. Functions controlled by toggle or push-button switches are either on or off. In some instances, a function switch can be used in conjunction with the joystick to give the machine a higher function speed range.

The JLG Scissor Lift is a two wheel drive machine with drive power being supplied by a hydraulic motor for each drive wheel. The rear wheels are supplied with spring applied, hydraulically released brakes. These brakes are automatically applied any time the drive joystick is returned to the neutral position.

The platform capacity of each scissor lift model is as follows:

Model 1532E3 - 270 kg

Model 1932E3 - 230 kg

Models 2033E3 / 2646E3 - 340 kg

Models 2046E3 / 2658E3 - 450 kg

The weight in the platform should be uniformly distributed in the center of the platform. The total combined weight of personnel, tools and supplies must not exceed the above figures.

Operators should refer to the specific capacity of the individual scissor lift indicated on the warning decals, paying particular attention to any wind related restrictions which may apply.

The platform may be raised only when positioned on firm, level and uniform surfaces.

4.2 GENERAL

This section provides the necessary information needed to operate the machine. Included in this section are the procedures for starting, stopping, traveling, steering, parking, platform loading and transporting the machine. It is important that the user read and understand the proper procedures before operating the machine.

4.3 MOTOR OPERATION

Power Selector Switch

The Power Selector switch functions to direct battery power to the desired control station. With the switch in the ground position, battery power is supplied to the emergency stop switch at the ground control station. When the switch is in the platform position, battery power is sup-

plied to the emergency stop switch at the platform control station. The Power Selector Switch should be in the off position when recharging the batteries and/or parking the machine overnight.

Emergency Stop Switch

This switch, when in the on (out) position, provides battery power to the ground controls or platform controls, as applicable. In addition, the switch can be used to turn off power (push the switch in) to the function controls in the event of an emergency. If the machine shuts down due to a trouble fault, turning the Emergency Stop Switch off and then on again will reset the JLG SMART™ system.

Motor Activation

With the power selector switch in the appropriate position (platform or ground) and the applicable emergency stop switch in the on position and a function switch or controller is operated and held, the motor becomes activated and operates the desired function. When operating the platform controls, the applicable function switch must be pressed before activating the controller to operate the function.

⚠ CAUTION

IF A MOTOR MALFUNCTION NECESSITATES AN UNSCHEDULED SHUTDOWN, DETERMINE AND CORRECT THE CAUSE BEFORE RESUMING ANY OPERATION.

⚠ IMPORTANT

ALWAYS POSITION THE POWER SELECTOR AND EMERGENCY STOP SWITCHES TO THE OFF POSITION WHEN THE MACHINE IS NOT IN USE.

⚠ IMPORTANT

E3 SERIES SCISSOR LIFTS ARE EQUIPPED WITH A PQ CONTROLLER, WHICH FEATURES A TRIGGER SWITCH ON THE FRONT OF THE JOYSTICK. THIS SWITCH MUST BE DEPRESSED TO OPERATE THE JOYSTICK, SELECT DESIRED FUNCTION, SQUEEZE THE TRIGGER, THEN POSITION THE JOYSTICK TO FORWARD OR REVERSE, AS DESIRED.

4.4 RAISING AND LOWERING (LIFTING)

⚠ WARNING

DO NOT RAISE THE PLATFORM EXCEPT ON A HARD, LEVEL SURFACE FREE OF OBSTRUCTIONS AND HOLES.

Raising

1. If the machine is shut down, place the power selector switch to the desired position (platform or ground).
2. Position the applicable emergency stop switch to the on position.
3. If operating from the ground controls, position the lift switch to up and hold until the desired elevation is achieved. If operating from the platform controls, press the lift switch and move the controller (joystick) forward and hold until the desired elevation is reached. The lift switch is part of the enable circuit, which supplies power to the lift switch and the joystick for 3 seconds after the lift switch is pressed. If the joystick is not activated within 3 seconds after the lift switch is pressed, power is removed from the switch and the joystick and the switch must be pressed again before activating the joystick. When the joystick is returned to the center off position, the operator has 3 seconds to re-activate the joystick or select another function before power is removed by the enable circuit. Do not try to operate the drive, lift, and powered deck extension functions simultaneously. If the drive, lift, and powered deck extension functions are selected simultaneously, no function will operate. If this occurs, pause, then press only one of the function switches to activate the function.

Lowering

⚠ WARNING

ENSURE THE SCISSOR ARM AREA IS FREE OF PERSONNEL PRIOR TO LOWERING THE PLATFORM.

If operating from the ground controls, position the lift switch to down and hold until the desired elevation is achieved or until the platform is fully lowered. If operating from the platform controls, press the lift switch and move the joystick backward and hold until the desired elevation is reached or until the platform is fully lowered. The lift switch is part of the enable circuit, which supplies power to the lift switch and the joystick for 3 seconds after the lift switch is pressed. If the joystick is not activated within 3 seconds after the lift switch is pressed, power is removed from the switch and the joystick and the switch must be pressed again before activating the joystick. When the joystick is returned to the center off position, the operator has 3 seconds to re-activate the joystick or select another function before power is removed by the enable circuit. Do not try to operate the drive, lift, and powered deck extension functions simultaneously. If the drive, lift, and powered deck extension functions are selected simultaneously, no function will operate. If this occurs, pause, then press only one of the function switches to activate the function.

⚠ WARNING

DO NOT LIFT DOWN WITHOUT COMPLETELY RETRACTING THE PLATFORM EXTENSION.

4.5 PLATFORM EXTENSION

Manual Platform Extension

The machine is equipped with a mechanically extendible deck, which adds 0.9 meters to the front of the platform, giving the operator better access to worksites. To extend the deck, squeeze the release lever on the handle on the right side of the platform to release the lock pin, then use the handle and handrail to push the extendible deck out. To retract the deck, squeeze the release lever to release the lock pin and use the handle and handrail to pull and retract the deck. Be sure the lock pin is locked in place after the deck is retracted. Maximum capacity of the deck extension is 113 kg - 1 person.

⚠ IMPORTANT

IF THE MACHINE IS EQUIPPED WITH THE OPTIONAL PIPE RACKS, THE PLATFORM EXTENSION MUST BE IN THE RETRACTED POSITION WHEN THE PIPE RACKS ARE LOADED. FAILURE TO RETRACT THE PLATFORM EXTENSION COULD RESULT IN DAMAGE TO THE PLATFORM EXTENSION.

⚠ IMPORTANT

IF THE MACHINE IS EQUIPPED WITH A POWERED DECK EXTENSION AND THE OPTIONAL FOLD-DOWN RAILS, THE RAILS MUST BE IN THE UPRIGHT POSITION BEFORE RETRACTING THE POWER DECK EXTENSION

4.6 STEERING

To steer the machine, the thumb operated steer control switch on the controller handle is positioned to the right for traveling right, or to the left for traveling left. When released, the switch will return to the center-off position and the wheels will remain in the previously selected position. To return the wheels to the straightened position, the switch must be activated in the opposite direction until the wheels are centered.

4.7 TRAVELING (DRIVING)

⚠ WARNING

DO NOT DRIVE WITH PLATFORM RAISED EXCEPT ON A SMOOTH, FIRM AND LEVEL SURFACE FREE OF OBSTRUCTIONS AND HOLES.
TO AVOID LOSS OF TRAVEL CONTROL OR UPSET ON GRADES AND SIDESLOPES, DO NOT DRIVE MACHINE ON GRADES OR SIDESLOPES EXCEEDING THOSE SPECIFIED FOR THE MACHINE.

⚠ WARNING

TRAVEL GRADES IN LOW DRIVE SPEED ONLY. USE EXTREME CAUTION WHEN DRIVING IN REVERSE AND AT ALL TIMES WHEN DRIVING WITH PLATFORM ELEVATED AND ESPECIALLY WHEN DRIVING WITH ANY PART OF MACHINE WITHIN 1.8 METERS OF AN OBSTRUCTION.
SELECTION OF MULTIPLE FUNCTIONS WHEN TRAVELING UP A GRADE CAN CAUSE AN OVERCURRENT SHUTDOWN TO OCCUR. IF THIS SHOULD HAPPEN, LET THE CONTROL HANDLE RETURN TO NEUTRAL, THEN PAUSE FOR 3-5 SECONDS TO ALLOW THE SYSTEM TO RESET BEFORE RE-SELECTING A FUNCTION. TO GO BACK DOWN THE GRADE, IF TRAVELING FORWARD UP THE GRADE, BUMP THE CONTROL HANDLE FORWARD SLIGHTLY TO ENSURE THE BRAKES ARE RELEASED BEFORE DESCENDING THE GRADE.

⚠ IMPORTANT

WHEN TRAVELING ON A GRADE, MAXIMUM TRACTION IS OBTAINED BY TRAVELING IN REVERSE. ALWAYS USE REVERSE TRAVEL WITH LOW SPEED AND POSI-TRAC ENGAGED WHEN LOADING ON A TRUCK OR WHEN ADEQUATE TRACTION IS NOT OBTAINED TRAVELING FORWARD.

NOTE: *The machine is equipped with a Pothole Protection System which lowers automatically when the platform is raised. If the pothole protection does not fully lower, the drive function is cut out until the platform is completely lowered.*

Traveling Forward

1. Place power selector switch at ground control station to platform.
2. Position emergency stop switch at Platform Control Station to on position.
3. Press drive switch, in conjunction with the trigger switch, and move joystick forward and hold for duration of travel. Drive speed is determined by the distance the joystick is moved from the center off position. The drive switch is part of the enable circuit, which supplies power to the drive switch and the joystick for 3 seconds after the drive switch is pressed. If the joystick is not activated within 3 seconds after the drive switch is pressed, power is removed from the switch and joystick and the switch must be pressed again before activating the joystick. When the joystick is returned to the center off position, the operator has 3 seconds to re-activate the joystick or select another function before power is removed by the enable circuit. For additional drive speed, press the high drive speed switch simultaneously when depressing the drive switch or while operating in the drive forward mode. The posi-trac switch can also be used in conjunction with drive to evenly divide the oil flow to each drive motor when

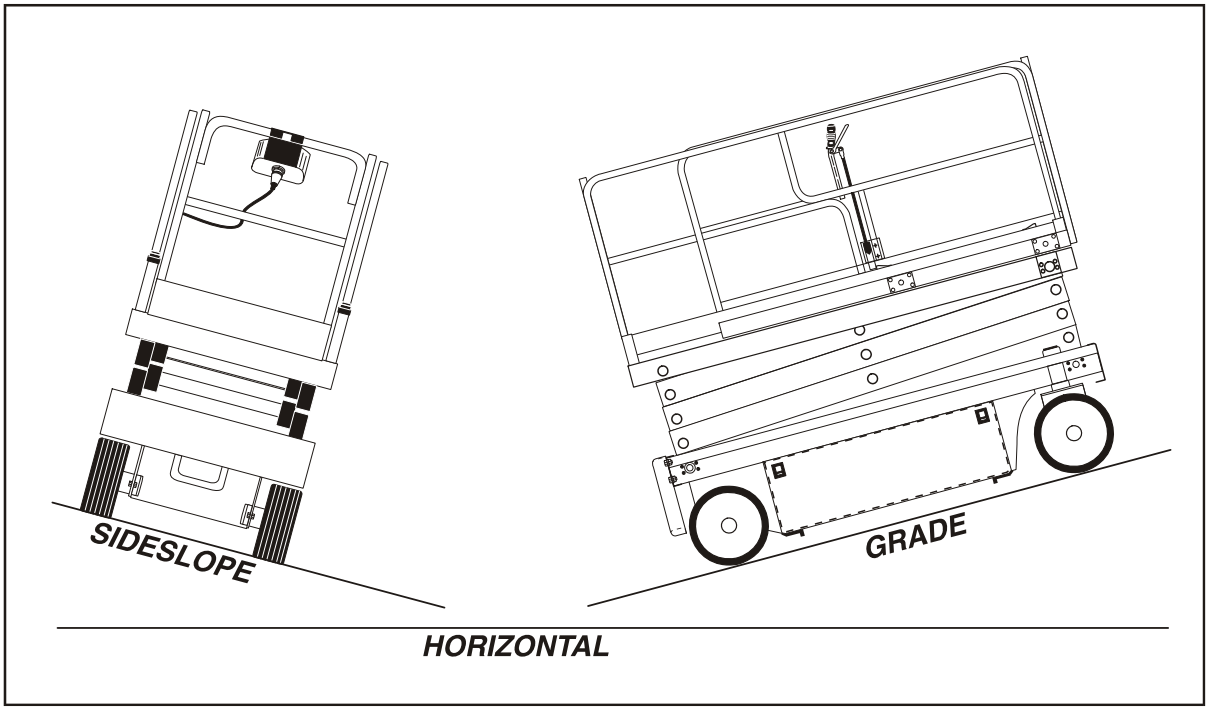


Figure 4-1. Grade and Sideslope

traction is a problem. Do not try to operate the drive, lift, and powered deck extension functions simultaneously. If the drive, lift and powered deck extension functions are selected simultaneously, no function will operate. If this occurs, pause, then press only one of the function switches to activate the function.

⚠ IMPORTANT

WHEN TRAVELING A GRADE, MAXIMUM TRACTION IS OBTAINED BY TRAVELING IN REVERSE. REVERSE TRAVEL SHOULD BE USED WHEN LOADING ON A TRUCK OR WHEN ADEQUATE TRACTION IS NOT ACHIEVED BY TRAVELING FORWARD.

Traveling in Reverse

1. Position power selector switch at ground control station to platform.
2. Position emergency stop switch at platform control station to on position.
3. Press drive switch, in conjunction with the trigger switch, and move joystick rearward (reverse) and hold for duration of travel. Drive speed is determined by the distance the joystick is moved from the center off position. The drive switch is part of the enable circuit, which supplies power to the drive switch and the joystick for 3 seconds after the drive switch is pressed. If the joystick is not activated within 3 seconds after the drive switch is pressed, power is removed from the switch and joystick and the switch must be pressed again before activating the joystick. When the joystick is returned to the center off position, the operator has 3 seconds to re-activate the joystick or select another function before power is removed by the enable circuit. **DO NOT activate the high drive speed switch when traveling in reverse.**

4.8 PARKING AND STOWING

NOTE: *When parking battery-powered units overnight, batteries should be charged in accordance with instructions in Section 2 to ensure readiness for the following workday.*

Park and stow machine as follows:

1. Drive machine to a reasonably well-protected and well-ventilated area.
2. Ensure platform is fully lowered.
3. Position emergency stop switch to off position.
4. If necessary, cover the instruction placards, caution and warning decals so that they will be protected from hostile environment.
5. Chock at least two wheels when parking machine for an extended period of time.
6. Turn switch to OFF and remove key to disable machine from unauthorized use.

4.9 PLATFORM LOADING

The platform maximum rated load capacity is shown on a placard located on the platform and is based upon the following criteria.

1. Machine is positioned on a smooth, firm and level surface.
2. All braking devices are engaged.
3. Maximum platform capacity for each model in its standard configuration is as follows:

   1532E3 - 270 kg

   1932E3 - 230 kg

   2033E3/2646E3 - 340 kg

   2046E3/2658E3 - 450 kg
4. Maximum capacity of the manual platform extension is 120 kg - 1 person.

NOTE: *It is important to remember that the load should be evenly distributed on the platform. The load should be placed near the center of the platform when possible.*

4.10 SAFETY PROP

⚠ CAUTION

THE SAFETY PROP MUST BE USED WHENEVER MAINTENANCE PERFORMED ON THE MACHINE REQUIRES THE SCISSOR ARMS TO BE RAISED.

To engage the safety prop, raise the platform, then rotate the prop clockwise until it hangs vertically. Lower the platform until the safety prop rests on the point provided on the frame. Maintenance can now begin.

To store the safety prop, raise the platform so that the prop can be rotated counterclockwise until it rests on the stop provided on the scissor arms.

4.11 TRANSPORTING, TIE DOWN AND LIFTING

Transporting (Loading/Unloading)

It is recommended the machine be winched when loading/unloading on a tilt/rollback type truck or trailer. Due to a potential loss of traction, winch using the frame mounted D-rings. To winch be sure the machines brakes are released.
Refer to the Emergency Towing Procedures in Section 6 or the Emergency Towing Decal affixed to the machine.

⚠ CAUTION

BE SURE THE MACHINE IS ON A LEVEL SURFACE OR PROPERLY SECURE BEFORE RELEASING THE BRAKES

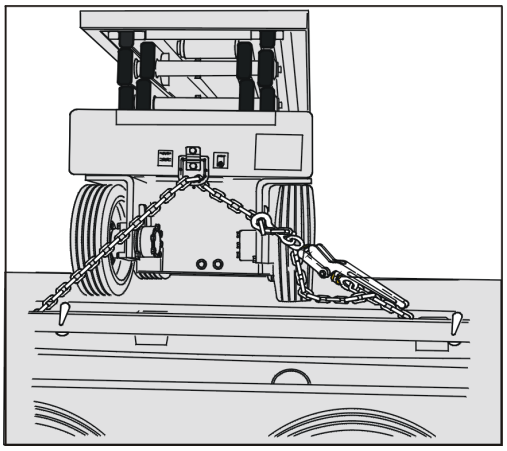


Figure 4-2. E3 Tie Down (front and rear typical)

⚠ WARNING

USE TIE DOWN EYES ONLY TO SECURE THE MACHINE FOR SHIPPING. DO NOT USE TIE DOWN EYES TO LIFT THE MACHINE.

Tie Down

When transporting the machine, the platform extension must be fully retracted and the platform fully lowered in the stowed mode with the machine securely tied down to the truck or trailer deck. A D-ring is bolted to both the center front and center rear of the frame for tie-down

Lifting

If it becomes necessary to lift the machine, it is possible to lift the machine with a forklift. On all models forklift pockets are provided at the rear of the machine.

In addition, all models can be lifted from either side with a forklift, provided the forks are placed at the positions indicated by the decals on the machine. It is very important that the forklift operator use only the designated lifting areas to lift the machine.

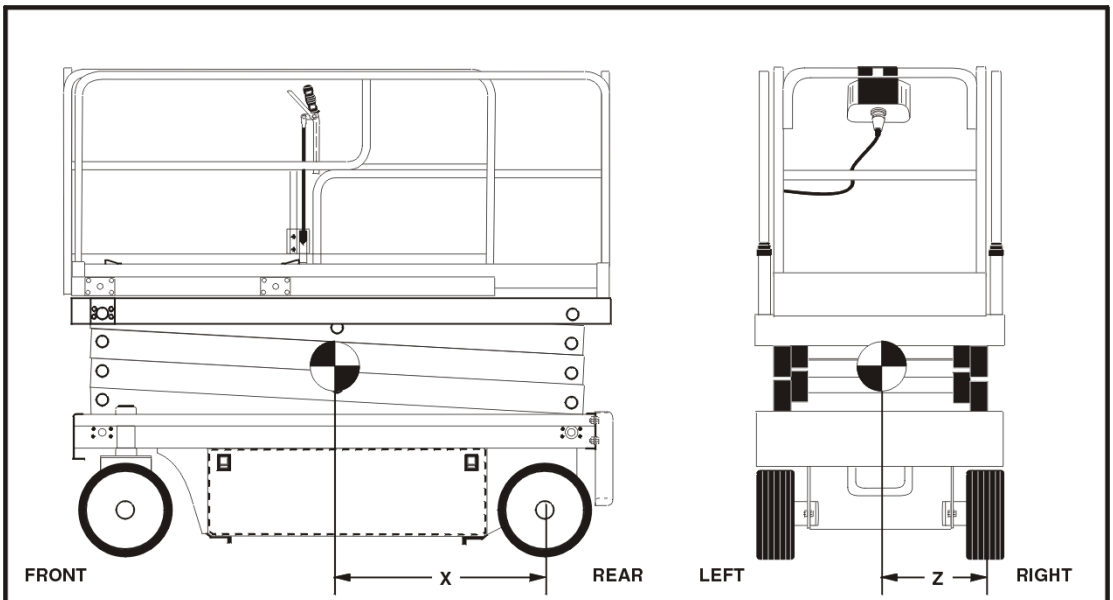
Machines may be equipped with optional bolt-on lifting lugs, which are attached to the four corners of the frame. These lugs enable the machine to be lifted using cranes or other suitable lifting devices.

NOTE: *If lifting becomes necessary, from the optional bolt on lifting lugs, JLG Industries Inc. recommends the use of a proper spreader bar to avoid damage to the machine.*

NOTE: *Forklifts, cranes, or other lifting devices must be capable of handling the following weights: 1532E3 - 1,315 kg; 1932E3 - 1,383 kg; 2033E3 - 2,032 kg; 2046E3 - 1,878 kg; 2646E3 - 2,073kg; 2658E3 - 2,236 kg.*

4.12 TOWING

It is not recommended that this machine be towed, except in the event of an emergency such as a machine malfunction or a total machine power failure. Refer to Section 6 for emergency towing procedures.



MODEL	FRONT AXLE (kg.)	REAR AXLE (kg.)	GVW (kg.)	WHEELBASE (cm.)	X (cm.)	Z (cm.)
1532E3	557	599	1315	127	61	37
1932E3	635	680	1383	127	64	38
2033E3	826	853	2032	185	91	36
2046E3	935	853	1878	185	97	54
2646E3	1026	953	2073	185	96	53
2658E3	1107	1016	2236	185	97	69

Figure 4-3. Lifting Chart

SECTION 5. EMERGENCY PROCEDURES

5.1 GENERAL

This section explains the steps to be taken in case of an emergency situation while operating.

5.2 INCIDENT NOTIFICATION

JLG Industries, Inc. must be notified immediately of any incident involving a JLG product. Even if no injury or property damage is evident, the factory should be contacted by telephone and provided with all necessary details.

JLG Phone: 717-485-5161

Failure to notify the manufacturer of an incident involving a JLG Industries product within 48 hours of such an occurrence may void any warranty consideration on that particular machine.

IMPORTANT

FOLLOWING ANY ACCIDENT, THOROUGHLY INSPECT THE MACHINE AND TEST ALL FUNCTIONS FIRST FROM THE GROUND CONTROLS, THEN FROM THE PLATFORM CONTROLS.

5.3 EMERGENCY TOWING PROCEDURES

Towing this machine is prohibited. However, provisions for moving the machine have been incorporated. The following procedures are to be used ONLY for emergency.

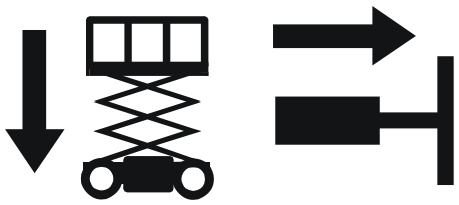
1. Chock wheels securely.
2. Engage the brake release on both drive hubs by loosening the bolts, completely reversing hub caps, and retightening the bolts.
3. Connect towing equipment and remove chocks.

After towing machine, complete the following procedure:

1. Position machine on a firm level surface.
2. Chock wheels securely.
3. Disengage the brake release on both drive hubs by loosening the bolts, completely reversing hub caps, and retightening the bolts.
4. Remove chocks.

5.4 MANUAL DESCENT SYSTEM

The manual descent system is used, in the event of total power failure, to lower the platform using gravity. Pull the handle located at the left front of the machine just above the tire.



5.5 EMERGENCY OPERATION

Operator Unable to Control Machine

NOTE: *IF THE PLATFORM OPERATOR IS PINNED, TRAPPED OR UNABLE TO OPERATE OR CONTROL MACHINE:*

1. Other personnel should operate the machine from ground controls only as required.
2. Other qualified personnel on the platform may use the platform controls. DO NOT CONTINUE OPERATION IF CONTROLS DO NOT FUNCTION PROPERLY.
3. Cranes, forklift trucks or other equipment which may be available are to be used to remove platform occupants and stabilize motion of the machine.

Platform Caught Overhead

If the platform or boom becomes jammed or snagged in overhead structures or equipment, rescue platform occupants prior to freeing the machine.

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SECTION 6. INSPECTION AND REPAIR LOG

Table 6-1.Inspection and Repair Log

Date	Comments

Table 6-1.Inspection and Repair Log

Date	Comments

3120877

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