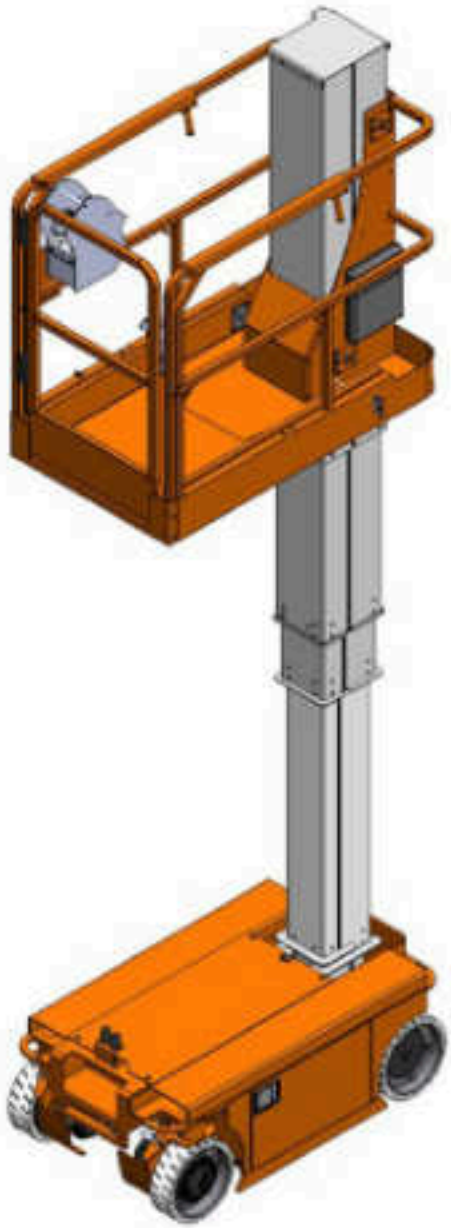
snorkel

TM12E
TM16E
TM20E



CE

OPERATOR'S MANUAL

ANSI/CSA/CE/AS/NZS
32 Inch Wide Chassis Machines

Part Number 1610427-000
February 2025

MidWestTech | Snorkel TM12E, TM16E, TM20E (32 Inch Wide Chassis) Vertical Mast Lift O... Order the manual at mid-west-tech.com >

Table of Contents

Electrical Danger ..... Inside Front Cover
Proposition 65 Warning ..... Inside Front Cover
Danger Symbols ..... Inside Front Cover
Lanyard Anchor Points ..... Inside Front Cover
Safety Rules ..... Inside Front Cover

Chapter 1 – Introduction

Aerial Platform Features 1
Options 1
Operator's Manual 1
Safety Alerts 1
Operation 1
Maintenance 2
  Used Material Disposal 2
Manual of Responsibilities – ANSI 2
MEWP Safe Use – AS/NZS 2
AS/NZS 1418.10 Commissioning 2
CE Compliance 2
Additional Information 2

Chapter 2 – Specifications

Component Identification 3
General Specifications – TM12E 4
General Specifications – TM16E 5
General Specifications – TM20E 6

Chapter 3 – Safety

Electrocution Hazards 7
Minimum Safe Approach Distance – ANSI 7
Minimum Safe Approach Distance – AS/NZS 8
Platform Capacity 8
Manual Force 8
Wind Speeds 8
Prestart Inspection 8
Work Place Inspection and Practices 8
Operation 9
Tip-Over and Falling Hazards 9
Electrical System 10
Hydraulic System 10
Placards and Decals 10
General Safety Rules 10

Chapter 4 – Safety Devices

Emergency Stop Controls 13
Control Select/Ground Operation Switch 13
Upper Control Interlock Switch 13
Pothole Protector Skids 13
Drive/Lift Level Sensor Interlock 14
Lowering Alarm 14
Overload Protection 14
Emergency Lowering Handle 14
Guardrails 15
Ground Fault Circuit Interrupter 15
Tilt Alarm 15
Horn 15
Lanyard Anchors 16

Chapter 5 – Gauges and Displays

Battery Charge Indicator 17
Battery Condition Indicator 17
Diagnostic Center Display 17
Hydraulic Fluid Level 17

Chapter 6 – Batteries

General Maintenance 19
Charging 19

Chapter 7 – Controls

Battery Disconnect 21
Lower Controls 21
  Emergency Stop Button 21
  Control Select/Ground Operation Switch 21
  Platform Raise/Lower Switch 21
  Brake Release Switch 22
Upper Controls 22
  Emergency Stop Button 22
  Drive/Lift Selector Switch 22
  Joystick 22
  Interlock Switch 22
  Steer Switch 23
  Horn Button 23
  Battery Condition Indicator 23

Chapter 8 – Prestart Inspection

Operator's Manual Holder 25
Electrical System 25
  Battery Fluid Level 25
  Battery Terminals 26
  Battery Charger 26
Blocking the Mast 26
Cables and Wiring Harness 26
Hydraulic System 27
  Fluid Level 27
  Hoses, Tubes, and Fittings 27
Diagnostic Center Display 27
Tires and Wheels 28
Lower Control Station 28
  Operating Controls 28
  Emergency Stop 28
  Lowering Alarm 28
Emergency Lowering System 28
Structures 29
  Weldments 29
  Mast Bearings 29
  Fasteners 29
Upper Control Station 29
  Guardrail System 29
  Lanyard Anchors 30
  Platform Extension 30
  Operating Controls 30
  Emergency Stop 32
  Horn Button 32
Electrical Power Outlet 32
Placards and Decals 32
Inspection and Maintenance Schedules 36
Prestart Inspection Checklist 37

MidWestTech | Snorkel TM12E, TM16E, TM20E (32 Inch Wide Chassis) Vertical Mast Lift O... Order the manual at mid-west-tech.com >

Chapter 9 – Operation

Preparing for Operation 39
Lower Controls 39
Upper Controls 39
Platform 40
  Raising and Lowering 40
  Overload Protection 40
  Extending 40
Driving and Steering 41
  Drive Speeds 41
  Drive/Lift Level Sensor Interlock 42
Swing-Out Trays 42
Electrical Power Outlet 42
Snorkel OnSite 43
After Use Each Day 43

Chapter 10 – Stowing and Transporting

Stowing 45
Transporting 45
  Lifting With a Forklift 45
  Driving 46
  Winching 46
  Hoisting 47
Securing for Transport 48
Storage 48

Chapter 11 – Emergency Operation

Emergency Lowering 49
Towing 49

Chapter 12 – Troubleshooting

Troubleshooting Chart 51

Appendix A – Glossary

Appendix B – Inspection Checklists

Limited Warranty

MidWestTech | Snorkel TM12E, TM16E, TM20E (32 Inch Wide Chassis) Vertical Mast Lift O... Order the manual at mid-west-tech.com >

General Specifications – TM16E

Aerial Platform

Working height	22′ (6.7 m)
Maximum platform height	16′ (4.9 m)
Minimum platform height	22″ (55.8 cm)
Turning radius	
Inside	Zero
Outside	55.5" (140.9 cm)
Wheelbase	41" (104.1 cm)
Ground clearance	
Pothole protector raised	3" (7.6 cm)
Pothole protector lowered	0.7" (1.7 cm)
Maximum wheel load	762 lbs (345 kg)
Maximum ground bearing pressure	125 psi (8.7 kg/cm²)
Maximum distributed floor load	265 psf (1293.8 kg/m²)
Weight, EVW	
Approximate	2,120 lb (962 kg)
Maximum allowable manual force (side pull)	
Indoors	90 lbs (400 N)
Outdoors	0 lbs (0 N)
Width	30″ (76.2 cm)
Stowed length	53.75" (1.36 m)
Stowed height	78" (1.98 m)

Platform

Main	29" x 39" (73.7 cm x 99 cm)
Extension length	18" (45.7 cm)
Total with extension	29" x 58" (73.7 cm x 147.3 cm)
Toeboard height	5" (12.7 cm)
Guardrail height	43.75" (1.1 m)
Rated work load	
Total	600 lb (272 kg)
Extension	250 lb (113 kg)
Maximum number of occupants	
Inside use only	2 people

Function Speed

Platform	
Up, maximum	25 seconds
Down, maximum	28 seconds
Drive	
High, platform lowered	2.7 mph (4.3 km/h)
Low, platform raised	0.5 mph (0.80 km/h)

Drive System

Standard	Two wheel drive
Gradeability	30%
Maximum drive height	16′ (4.9 m)
Parking brake	2 wheel spring applied electric release

Drive/Lift Level Sensor Interlock

Side-to-side	2 degrees
Front-to-rear	3 degrees

Tires

Non-marking, solid rubber	12.7" (323 mm) diameter

Electrical System

Voltage	24 V DC negative chassis ground
Source	Four - 6 V 220 Ah batteries
Fluid recommended	distilled water
Battery duty cycle	25% for 8 hours
Battery charger	25 amp
Input	90/240 V
Minimum battery weight	65 lb (29.5 kg)
DC electric motor	24VDC/2kw/2.7 hp

Hydraulic System

Maximum pressure	2,000 psi (13789.5 kPa)
Reservoir capacity – Wuxi	1.1 US gal (4 l)
Reservoir capacity	0.8 US gal (3 l)
Maximum operating temperature	200°F (93°C)
Minimum operating temperature	-20°F (-28°C)
Hydraulic fluid recommended	
Above 10°F (-12°C)	ISO VG32
Below 10°F (-12°C)	ISO VG15

Ambient Air Temperature Operating Range

Fahrenheit	0°F to 110°F
Celsius	-18°C to 43°C

Maximum Wind Speed

Gust or steady	Zero

MidWestTech | Snorkel TM12E, TM16E, TM20E (32 Inch Wide Chassis) Vertical Mast Lift O... Order the manual at mid-west-tech.com >

Steer Switch
The steer switch (refer to Figure 7.3) is a momentary contact, rocker switch on top of the drive joystick. This switch controls the two front wheels to steer the aerial platform.

- To steer to the right, engage the interlock switch on the joystick and hold down the right side of the steer switch.

- To steer to the left, engage the interlock switch on the joystick and hold down the left side of the steer switch.

Note
The steering wheels are not self-centering. Set the steering wheels straight ahead after completing a turn.

Horn Button
The horn button (refer to Figure 7.3) is on the front of the upper control panel.

Press the button to sound the horn.

Battery Condition Indicator
The battery condition indicator (refer to Figure 7.3) is located on the top of the upper control panel. When the light comes on, the lift function is cut out and drive speed is reduced to slow.

MidWestTech | Snorkel TM12E, TM16E, TM20E (32 Inch Wide Chassis) Vertical Mast Lift O... Order the manual at mid-west-tech.com >

Annual Maintenance – Every 500 Hours

Item	Procedure	Information	P/F/R
Frequent Maintenance Checklist	Complete Frequent Maintenance		
Hydraulic System			
Hydraulic fluid condition	Drain, flush, and clean hydraulic system. Refill with new fluid.	Above 10°F (-12°C) ISO VG32 Below 10°F (-12°C) ISO VG15	
Suction filter	Replace	Refer to Parts Manual for filter part number	
System pressure	Check system relief pressure	System Relief Pressure 2,000 psi (137 bar)	

Maintenance Table Key: P = Pass, F = Fail, R = Repaired

Date:_____ Owner:_____

Model:_____ Serial Number:_____

Serviced By:_____

MidWestTech | Snorkel TM12E, TM16E, TM20E (32 Inch Wide Chassis) Vertical Mast Lift O... Order the manual at mid-west-tech.com >

SAFETY RULES

⚠Warning

All personnel shall carefully read, understand and follow all safety rules and operating instructions before operating or performing maintenance on any Snorkel aerial work platform.

Electrocution Hazard	Tip Over Hazard	Collision Hazard	Fall Hazard
			
THIS MACHINE IS NOT INSULATED!	**NEVER** elevate the platform or drive the machine while elevated unless the machine is on a firm, level surface.	**NEVER** position the platform without first checking for overhead obstructions or other hazards.	**NEVER** climb, stand, or sit on platform guardrails or midrail.

USE OF THE AERIAL WORK PLATFORM: This aerial work platform is intended to lift persons, their tools and materials used for the job. It is designed for repair, assembly, stockpicking jobs, etc., and assignments at workplaces above head height (ceilings, cranes, roof structures, buildings, shelving, etc.). All other uses of the aerial work platform are prohibited and the rules below must be adhered to!

THIS AERIAL WORK PLATFORM IS NOT INSULATED! Refer to applicable national standards for safe approach distances.

Exceeding the specified permissible maximum load **is prohibited!** See "Platform Capacity" for details.

The use and operation of the aerial work platform as a lifting tool or a crane **is prohibited!**

NEVER exceed the manual force allowed for this machine. See "Manual Force" for details.

DISTRIBUTE all platform loads evenly on the platform.

NEVER operate the machine without first surveying the work area for stationary or moving obstacles and surface hazards such as holes, drop-offs, bumps, curbs, or debris; and avoiding them. **NEVER** strike or bump into stationary or moving obstacles while driving or raising, lowering, or extending the platform.

USE THREE POINTS OF SUPPORT when entering or exiting the platform. For example, use two hands and one foot when climbing into the platform.

PLATFORM passengers should watch their hands and fingers for pinch points while holding on the guardrails while the platform is moving.

OPERATE machine only on surfaces capable of supporting wheel loads.

NEVER operate the machine when wind speeds exceed this machine's wind rating. See "Beaufort Scale" for details.

Do not operate the aerial platform in windy or gusty conditions. Do not add anything to or take anything into the aerial platform that will increase the wind loading such as billboards, banners, flags, etc.

IN CASE OF EMERGENCY push EMERGENCY STOP switch to deactivate all powered functions.

IF ALARM SOUNDS while platform is elevated, STOP, carefully lower platform. Move machine to a firm, level surface.

Climbing up the railing of the platform, standing on or stepping from the platform onto buildings, steel or prefab concrete structures, etc., **is prohibited! NEVER** exit or enter the platform when it is elevated.

Dismantling the entry gate or other railing components **is prohibited!** Always make certain that the entry gate is closed!

It is prohibited to keep the entry gate in an open position when the platform is raised!

To extend the height or the range by placing of ladders, scaffolds or similar devices on the platform **is prohibited!**

NEVER perform service on machine while platform is elevated without blocking elevating assembly.

INSPECT the machine thoroughly for cracked welds, loose or missing hardware, hydraulic leaks, loose wire connections, and damaged cables or hoses before using.

VERIFY that all labels are in place and legible before using.

NEVER use a machine that is damaged, not functioning properly, or has damaged or missing labels.

To bypass any safety equipment **is prohibited** and presents a danger for the persons on the aerial work platform and in its working range.

NEVER charge batteries near sparks or open flame. Charging batteries emit explosive hydrogen gas.

Modifications to the aerial work platform **are prohibited** or permissible only at the approval by **Snorkel**.

AFTER USE, secure the work platform from unauthorized use by turning the keyswitch off and removing key.

The driving of MEWP's on the public highway is subject to national traffic regulations.

Certain inherent risks remain in the operation of this machine despite utilizing proper design practices and safeguarding.

Care must be taken to ensure that the machines meets the requirements of stability during use, transportation, assembly, dismantling when out of service, testing, or foreseeable breakdowns.

In the event of an accident or breakdown see "Emergency Lowering." Do not operate the aerial platform if it is damaged or not functioning properly. Qualified maintenance personnel must correct the problem before putting the aerial platform back into service.

MidWestTech | Snorkel TM12E, TM16E, TM20E (32 Inch Wide Chassis) Vertical Mast Lift O... Order the manual at mid-west-tech.com >

Minimum Safe Approach Distance – AS/NZS

Minimum safe approach distances to energized power lines and their associated parts must be observed while operating the aerial platform.

⚠Danger

The aerial platform is not electrically insulated. Death or serious injury will result from contact with, or inadequate clearance from, an energized conductor. Do not go closer than the minimum safe approach distance as defined by national safety regulations.

AS/NZS 2550.10:2006 define minimum distances that must be observed when working near overhead power lines on poles and overhead power lines on towers. Refer to the clearance requirements decals on the machine to determine safe approach distances (refer to Figure 1).

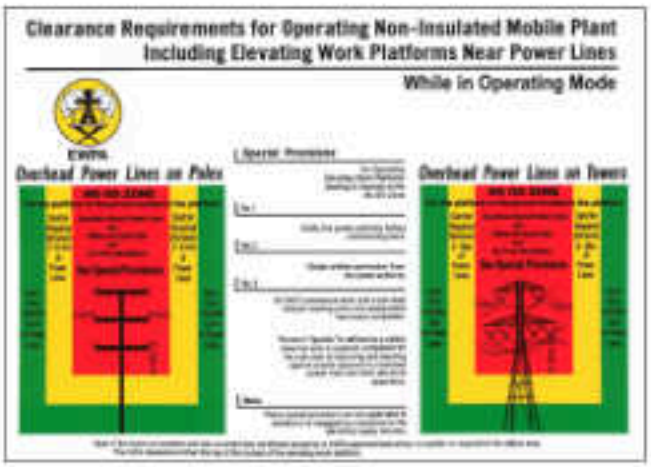


Figure 1 – Minimum Safe Approach Distance

Platform Capacity

The maximum unrestricted rated load capacity and the maximum number of occupants for the aerial platform are stated on machine decals, placards, and in the machine specifications in this manual.

⚠Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Do not exceed the capacity values indicated on the machine decals, placards, and in the machine specifications in this manual.

Manual Force

Manual force is the force applied by the occupants to objects such as walls or other structures outside the work platform.

⚠Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Do not exceed the maximum allowable manual force indicated on the machine decals, placards, and in the machine specifications in this manual.

Refer to the machine decals, placards, or machine specification in this manual for the specific machine maximum allowable manual force.

Wind Speeds

Do not add anything to the aerial platform that will increase the wind loading such as billboards, banners, flags, etc.

⚠Danger

The aerial platform can tip over if it becomes unstable. Death or serious injury will result from a tip-over accident. Refer to the machine decals, placards, and machine specification in this manual for the specific machine wind speed rating for operation in wind gusts or steady wind conditions.

Refer to the machine decals, placards, and machine specification in this manual for the specific machine wind speed rating.

If the aerial platform is rated for use in windy conditions, do not operate it in windy conditions with wind gusts or steady wind speeds of 28 mph (12.5 m/s) or greater. Refer to Figure 2.

Prestart Inspection

Perform a prestart inspection before each shift as described in Chapter 8. Do not use the aerial platform on the job unless you are trained and authorized to do so.

Work Place Inspection and Practices

Do not use the aerial platform as a ground connection when welding.

- The welding ground clamp must be attached to the same structure that is being welded.

BEAUFORT RATING	WIND SPEED				GROUND CONDITIONS
	m/s	km/h	ft/s	mph	
3	3,4~5,4	12,25~19,4	11.5~17.75	7.5~12.0	Papers and thin branches move, flags wave.
4	5,4~8,0	19,4~28,8	17.75~26.25	12.0~18	Dust is raised, paper whirls up, and small branches sway.
5	8,0~10,8	28,8~38,9	26.25~35.5	18~24.25	Shrubs with leaves start swaying. Wave crests are apparent in ponds or swamps.
6	10,8~13,9	38,9~50,0	35,5~45.5	24.5~31	Tree branches move. Power lines whistle. It is difficult to open an umbrella.
7	13,9~17,2	50,0~61,9	45.5~56.5	31.~38.5	Whole trees sway. It is difficult to walk against the wind.

Figure 2 – Beaufort Scale

MidWestTech | Snorkel TM12E, TM16E, TM20E (32 Inch Wide Chassis) Vertical Mast Lift O... Order the manual at mid-west-tech.com >