

VO-350/355/360-MHI VO-350X/355X/360X-MHI BASIC SPECIFICATIONS

This section includes a brief description of each of the major (standard) components

PLATFORM CONTROLS - Includes a 3-Axis single handle controller with safety trigger, a locking lever for platform tilt, and controls for emergency stop, platform stow/unstow, platform rotation, and jib/winch operation. Also includes dual hydraulic tools with a 2000 psi reducing valve. Control valves are full pressure, full flow, manual type valves.

PLATFORM CONFIGURATIONS

SINGLE 1-MAN PLATFORM – One single person, curbside mounted fiberglass platform (24" x 30" x 42" nominal size), with one inside and outside step. Includes two lanyard attachment points, 90⁰ hydraulic rotation, and a tubular rubber platform rest. The standard platform capacity is 400 lbs (180 kg).

SINGLE 2-MAN PLATFORM – One two-person, curbside mounted fiberglass platform (24" x 48" x 42" nominal size), with one inside and outside step. Includes two lanyard attachment points, 90⁰ hydraulic rotation, and a tubular rubber platform rest. The standard platform capacity is 700 lbs (317 kg) on the VO-350, VO-350X, VO-355, and VO-355X. The standard platform capacity is 600 lbs (317 kg) on the VO-360, and VO-360X.

DUAL 1-MAN PLATFORMS – Two single person, side mounted fiberglass platforms (24" x 30" x 42" nominal size), each with one inside and outside step. Includes two lanyard attachment points, 90⁰ hydraulic rotation for each platform, and a tubular rubber platform rest for each platform. The standard platform capacity is 350 lbs (160 kg) for each platform. Dual platforms are not available on the VO-360 and VO-360X.

PERSONELL RESTRAINT - A safety belt or harness and a lanyard are required and can be supplied by Time Manufacturing Company at an additional cost. Consult applicable work practices and regulations to choose between a safety belt and a harness.

MECHANICAL PLATFORM LEVELING – The platform is automatically leveled by an enclosed parallelogram system. The major components are ¾" (19 mm) diameter fiberglass rods, and ANSI #120 roller chain. The fiberglass rods maintain the insulation gaps in all boom positions and are 100% tested at twice the rated load.

HYDRAULIC PLATFORM TILT – A lever at the platform tilts the platform for rescue or clean-out. This is accomplished by a double acting hydraulic cylinder with two holding valves mounted at the turret, which drives the mechanical leveling system. A control lever at the lower control station (turret) is optional.

MANUAL EXTEND HYDRAULIC TILT 5 FT JIB AND WINCH - The material handling jib pole hydraulically articulates from +90⁰ to -35⁰, and the pole manually extends to 60" (1.5 m) in two 18" (46 cm) increments. A self-locking worm gearbox hydraulically powers the winch, which is rated at 2000 lbs (905 kg) full drum and includes 75' (22.9 m) of 9/16" (14mm) diameter polyester rope with clevis hook. A control valve for the winch is provided at both the upper and lower controls.

STANDARD JIB CAPACITY RATING (VO-350, VO-355, VO-360) – Provides the maximum available jib capacity. Jib capacities are independent of the lower boom angle. Capacities vary with model and platform configuration. The maximum jib capacity is 2000 lbs.

STANDARD JIB CAPACITY RATING (VO-350X, VO-355X, VO-360X) – Provides jib capacities that are slightly reduced from the maximum in some boom positions, to reduce the stability requirements. Jib capacities are increased when the lower boom is less than 100° above horizontal. Capacities vary with model and platform configuration. The maximum jib capacity is 2000 lbs.

UPPER BOOM – Constructed from 10.5" x 12.5" (27 cm x 32 cm) rectangular high strength filament wound epoxy resin fiberglass which is bonded and bolted to steel weldments at each end. The fiberglass section has a gel coat and high gloss urethane finish for added weather protection and water beading. The upper boom is articulated 210° by one double acting cylinder with two holding valves through a 4-bar mechanical linkage. An upper boom storage cradle mounted on the lower boom assures solid boom support in the stowed position. A ratchet-type boom tie-down strap is included. A side by side boom design allows low travel height and improved platform access.

LOWER BOOM (VO-350) – Constructed from 12" x 14" (30 cm x 35 cm) cross-section high strength steel and a filament wound, high strength, epoxy resin fiberglass insert. The fiberglass insert provides a 12" (30 cm) insulation gap. The boom articulation is from 0 to 101° using a double acting hydraulic cylinder equipped with two integral holding valves.

LOWER BOOM (VO-350X) – Constructed from 12" x 14" (30 cm x 35 cm) cross-section high strength steel and a filament wound, high strength, epoxy resin fiberglass insert. The fiberglass insert provides a 12" (30 cm) insulation gap. The boom articulation is from 0 to 125° using a double acting hydraulic cylinder equipped with two integral holding valves.

LOWER BOOM (VO-355, VO-360) – Constructed from 12" x 14" (30 cm x 35 cm) cross-section high strength steel and a filament wound, high strength, epoxy resin fiberglass insert. The fiberglass insert provides a 24" (60 cm) insulation gap. The boom articulation is from 0 to 101° using a double acting hydraulic cylinder equipped with two integral holding valves.

LOWER BOOM (VO-355X, VO-360X) – Constructed from 12" x 14" (30 cm x 35 cm) cross-section high strength steel and a filament wound, high strength, epoxy resin fiberglass insert. The fiberglass insert provides a 24" (60 cm) insulation gap. The boom articulation is from 0 to 125° using a double acting hydraulic cylinder equipped with two integral holding valves.

BOOM CYLINDERS - The upper and lower boom cylinder rod eyes are both threaded and welded. Both cylinders are fully retracted when stowed, protecting them from damage and rust.

TURRET – Fixture welded steel structure is constructed from ¾" (19 mm) thick plate wings and a 1.5" (38 mm) thick base plate. The base plate is machined flat to support the rotation bearing and gearbox. With a single platform configuration, the turret supports the lower boom along the centerline of the chassis when stowed. With a dual platform configuration, the turret offsets the lower boom to the curb side, providing room for the street side platform.

LOWER CONTROLS – Consists of individual control levers mounted on the turret which actuate the lower boom, upper boom, rotation, and winch. The lower controls also include an upper control over-ride/e-stop. The lower control valve is a full pressure, full flow manual type valve.

CONTINUOUS ROTATION - Rotation is continuous and unrestricted in either direction. The rotation system consists of a hydraulically driven worm and spur gear acting on a shear-ball rotation bearing. The critical bolts holding the lift to the rotation bearing and the rotation bearing to the pedestal are grade 8. These critical bolts are torque seal marked to provide a quick means of detecting any loosening. An eccentric ring gearbox mounting allows for precise backlash adjustments.

PINS, BEARINGS, AND LUBRICATION – Pivot pins are made from high strength hard chrome plated steel with fiberglass reinforced Teflon non-lube bearings. Only the rotation bearing and leveling chains require lubrication.

40 IN TALL PEDESTAL - The pedestal is a fabricated steel structure incorporating a 1.5" (38 mm) thick top plate which is machined flat to support the rotation bearing. (The 40 in (1.0 m) height refers to the installed height, measured from the top of the chassis frame to the top of the pedestal.)

HYDRAULIC SYSTEM - The open center hydraulic system operates at 3000 PSI (210 kg/cm²) and provides up to 8 GPM (30 LPM). With the optional automatic throttle control, the system provides up to 8 GPM (30 LPM) at engine idle and 12 GPM (45 LPM) with the automatic two speed throttle advanced.

OIL RESERVOIR – 30 gallon bulkhead mount reservoir. Includes cleanout, 10 micron return filter that can be replaced without draining the reservoir, filter gauge, 100 mesh (149 micron) suction screen, gate valve, and magnetic drain plug.

ENGINE START/STOP CONTROL - An air cylinder at the upper controls and a toggle switch at the lower controls operate the system.

HOSES AND FITTINGS - The high pressure hoses routed through the booms are non-conductive hoses with swaged hose end fittings. Retainers are used to separate the hoses inside the booms to prevent chafing and nylon sleeves are installed over hoses at points of movement. Reusable hose fittings can be installed if a hose is damaged.

ELECTRICAL INSULATION SPECIFICATIONS - The upper boom is tested and certified according to ANSI A92.2 Category C dielectric rating requirements. This allows the unit to be rated at the design voltage of 46kv and below. The chassis insulating system (lower boom insert) is also tested and certified according to ANSI A92.2. Vacuum prevention for all the hydraulic hoses routed through the insulated booms is standard.

MANUALS - Two operator's manuals and two service manuals are included.

PAINTING - The complete unit is primed and painted prior to assembly. The standard color is white urethane.

**VO-350/355/360-MHI
VO-350X/355X/360X-MHI
OPTION SPECIFICATIONS**

This section contains a brief description of some of the numerous available options.

DUAL UPPER CONTROLS – Additional 3-axis single handle controller with safety trigger mounted between the street side platform and the boom. Available with dual platforms only. With this option, the maximum platform capacity is 350 lbs (160 kg) for each platform on the VO-355 and VO-355X.

HR UPPER CONTROLS – The high electrical resistant (HR) upper single stick control and control panel incorporate nonconductive materials into the design to provide a secondary layer of protection for the operator. The single stick includes a trigger interlock guard to help prevent inadvertent operation. The main control handle is tested to assure resistance at 40kV with a maximum current level of 400 microamperes. The ancillary boom and jib controls are covered with non conductive materials, but are not tested. The control panel is covered with a non-conductive panel to cover any exposed metal components.

INSULATED PLATFORM LINER - Liners are available for all standard sized platforms. The liners are tested and rated for 50 KV AC.

PLATFORM COVER - Soft vinyl covers are available to fit all standard sized platforms.

HYDRAULIC EXTEND HYDRAULIC TILT 5 FT JIB AND WINCH - The material handling jib pole hydraulically articulates from +90⁰ to -35⁰, and the pole hydraulically extends to 60" (1.5 m) in two 18" (46 cm) increments. A self-locking worm gearbox hydraulically powers the winch, which is rated at 2000 lbs (905 kg) full drum and includes 75' (22.9 m) of 9/16" (14mm) diameter polyester rope with clevis hook. A control valve for the winch is provided at both the upper and lower controls.

MANUAL EXTEND HYDRAULIC TILT 6.5 FT JIB AND WINCH - The material handling jib pole hydraulically articulates from +90⁰ to -35⁰, and the pole manually extends to 78" (2.0 m) in three 18" (46 cm) increments. A self-locking worm gearbox hydraulically powers the winch, which is rated at 2000 lbs (905 kg) full drum and includes 75' (22.9 m) of 9/16" (14mm) diameter polyester rope with clevis hook. A control valve for the winch is provided at both the upper and lower controls.

HYDRAULIC EXTEND HYDRAULIC TILT 6.5 FT JIB AND WINCH - The material handling jib pole hydraulically articulates from +90⁰ to -35⁰, and the pole hydraulically extends to 78" (2.0 m) in three 18" (46 cm) increments. A self-locking worm gearbox hydraulically powers the winch, which is rated at 2000 lbs (905 kg) full drum and includes 75' (22.9 m) of 9/16" (14mm) diameter polyester rope with clevis hook. A control valve for the winch is provided at both the upper and lower controls.

LIFTING EYE ATTACHMENT - The lifting eye attachment is located near the elbow on the lower boom. The lifting eye has a maximum capacity of 2500 lbs (1100 kg).

AUTOMATIC TWO SPEED THROTTLE – Automatically advances the engine idle speed when operating a boom function from the upper controls. At engine idle, the system provides the desired flow for hydraulic tools. When a lift function is engaged, the engine speed increases to provide efficient boom speeds. The system also includes a toggle switch to manually advance the throttle from the lower controls. This option requires the use of an additional pass in the collector ring assembly.

EMERGENCY POWER - An auxiliary hydraulic pump designed to bring the booms down in case the main hydraulic source fails. This system consists of a hydraulic pump driven by a DC motor, which is powered by the truck's engine battery. The system is connected in parallel with the main pump and is designed for non-continuous operation. An air cylinder at the upper controls is used to energize this system. This option requires the use of an additional pass in the collector ring assembly.

CATEGORY B DIELECTRIC TESTING AND CERTIFICATION - Testing and certification for ANSI A92.2 Category B. This option includes a lower test electrode system (test bands). This option allows the unit to be rated up to the design voltage of 69 KV.

SUB-FRAME – The full length sub-frame is constructed of 3" x 6" (76 mm x 152 mm) rectangular tubing and 3/8" (10 mm) plate. Shear plates are provided to attach to the vehicle chassis.

46 IN TALL PEDESTAL - The pedestal is a fabricated steel structure incorporating a 1.5" (38 mm) thick top plate which is machined flat to support the rotation bearing. (The 46 in (1.2 m) height refers to the installed height, measured from the top of the chassis frame to the top of the pedestal.) This pedestal may be trimmed at installation up to 6 in (15 cm) to obtain the desired travel height and cab clearance.

A-FRAME OUTRIGGERS - A-frame outriggers are designed and constructed from high-strength steel. The cross-beam is shipped loose to allow the desired ground clearance and penetration to be determined at installation. At maximum extension the outriggers provide 158" (4.0 m) of spread and from 6" to 11" (15 cm to 28 cm) of penetration based on a 40" (1.02 m) frame height. Outriggers are equipped with pilot operated check valves, internal thermal relief valves, and separate operating controls for each outrigger. Slide pads at each leg ensure smooth operation. The standard pivot feet swivel a minimum of 10° each way.

X-FRAME OUTRIGGERS, FLIP FOOT - X-frame outriggers are designed and constructed from high-strength steel. The mounting plates are shipped loose to allow the desired ground clearance and penetration to be determined at installation. At maximum extension the outriggers provide 176.5" (4.5 m) of spread and from 5" to 12" (13 cm to 30 cm) of penetration based on a 40" (1.02 m) frame height. Outriggers are equipped with pilot operated check valves, internal thermal relief valves, and separate operating controls for each outrigger. Slide pads at each leg ensure smooth operation. The standard pivot feet swivel a minimum of 10° each way.

RADIAL OUTRIGGERS - Radial outriggers are designed and constructed from high-strength steel. At 11" (28 cm) of penetration the outriggers provide 211" (5.4 m) of spread based on a 40" (1.02 m) frame height. Outriggers are equipped with pilot operated check valves, internal thermal relief valves, and separate operating controls for each outrigger.

OUTRIGGER/BOOM INTERLOCK - The outrigger/boom interlock option is a feature designed to prevent the lift from being operated until the outriggers contact the ground. The interlock also prevents the outriggers from being retracted before the aerial lift is properly stored.

INCREASED PLATFORM CAPACITY – Increased platform capacities are available, up to the maximums shown on the tables below. Increased platform capacities may increase the curb weight required for stability.

REDUCED PLATFORM CAPACITY – Reduced platform capacities below the listed standard values are available.

MAXIMUM JIB CAPACITY RATING (VO-350X, VO-355X, VO-360X) – Provides the maximum available jib capacity. Jib capacities are independent of the lower boom angle. Capacities vary with model and platform configuration. The maximum jib capacity is 2000 lbs.

PLATFORM TILT AT LOWER CONTROLS – An additional lever at the lower control station operates the platform stow/unstow function.

DIMENSIONAL SPECIFICATIONS

All values are nominal.

ITEM	VO-350	VO-355	VO-360
Height to Bottom of Platform	50.3' (15.3 m)	55.3' (16.9 m)	60.3' (18.4 m)
Working Height	55.3' (16.9 m)	60.3' (18.4 m)	65.3' (19.9 m)
Horizontal Reach Overcenter	42.2' (12.9 m)	47.2' (14.4 m)	52.2' (15.9 m)
Horizontal Reach Non-Overcenter	31.9' (9.7 m)	34.9' (10.6 m)	37.9' (11.6 m)
Max Platform Capacity Single 1-Man	450 lbs (205 kg)	450 lbs (205 kg)	450 lbs (205 kg)
Max Platform Capacity Single 2-Man	800 lbs (360 kg)	800 lbs (360 kg)	600 lbs (270 kg)
Max Total Platform Capacity Dual 1-Man	800 lbs (360 kg)	800 lbs (360 kg)	Not available
Max Total Platform Capacity Dual 1-Man With Dual Controls	800 lbs (360 kg)	700 lbs (320 kg)	Not available
Upper Boom Articulation		210 ⁰	
Lower Boom Articulation		101 ⁰	
Stowed Travel Height		11' (3.4 m)	
Maximum Jib Capacity		2000 lbs (900 kg)	
Lower Boom Lift Eye Capacity		2500 lbs (1100 kg)	
Hydraulic System Pressure		3000 psi (210 kg/cm ²)	
Hydraulic System Type		Open Center	
Upper Boom Insulation Gap	9.5' (2.9 m)	12' (3.7 m)	14.5' (4.4 m)
Lower Boom Insulation Gap	12" (30 cm)	24" (60 cm)	24" (60 cm)
Approximate Weight of Lift with Pedestal	7230 lbs (3280 kg)	7380 lbs (3350 kg)	7570 lbs (3430 kg)
Ambient Temperature Range for Structural Integrity		-40°F (-40°C) to 125°F (52°C)	

Notes:

1. All height dimensions are based on a 40" (1.02 m) chassis frame height and a standard 40" (1.02 m) tall pedestal. Subtract 6" (15 cm) for the 36" (.91 m) pedestal. Add 6" (15 cm) for the 46" (1.17 m) pedestal.
2. Actual travel height will vary with frame height, cab height, pedestal height, mounting location, etc.

DIMENSIONAL SPECIFICATIONS

All values are nominal.

ITEM	VO-350X	VO-355X	VO-360X
Height to Bottom of Platform	50.3' (15.3 m)	55.3' (16.9 m)	60.3' (18.4 m)
Working Height	55.3' (16.9 m)	60.3' (18.4 m)	65.3' (19.9 m)
Horizontal Reach Overcenter	42.2' (12.9 m)	47.2' (14.4 m)	52.2' (15.9 m)
Horizontal Reach Non-Overcenter	39.2' (11.9 m)	43.2' (13.2 m)	47.1' (14.4 m)
Max Platform Capacity Single 1-Man	450 lbs (205 kg)	450 lbs (205 kg)	450 lbs (205 kg)
Max Platform Capacity Single 2-Man	800 lbs (360 kg)	800 lbs (360 kg)	600 lbs (270 kg)
Max Total Platform Capacity Dual 1-Man	800 lbs (360 kg)	800 lbs (360 kg)	Not Available
Max Total Platform Capacity Dual 1-Man With Dual Controls	800 lbs (360 kg)	700 lbs (320 kg)	Not Available
Upper Boom Articulation	210 ⁰		
Lower Boom Articulation	125 ⁰		
Stowed Travel Height	11' (3.4 m)		
Maximum Jib Capacity	2000 lbs (900 kg)		
Lower Boom Lift Eye Capacity	2500 lbs (1100 kg)		
Hydraulic System Pressure	3000 psi (210 kg/cm ²)		
Hydraulic System Type	Open Center		
Upper Boom Insulation Gap	9.5' (2.9 m)	12' (3.7 m)	14.5' (4.4 m)
Lower Boom Insulation Gap	12" (30 cm)	24" (60 cm)	24" (60 cm)
Approximate Weight of Lift with Pedestal	7560 lbs (3430 kg)	7710 lbs (3500 kg)	7910 lbs (3590 kg)
Ambient Temperature Range for Structural Integrity	-40°F (-40°C) to 125°F (52°C)		

Notes:

1. All height dimensions are based on a 40" (1.02 m) chassis frame height and a standard 40" (1.02 m) tall pedestal. Subtract 6" (15 cm) for the 36" (.91 m) pedestal. Add 6" (15 cm) for the 46" (1.17 m) pedestal.
2. Actual travel height will vary with frame height, cab height, pedestal height, mounting location, etc.

VO-350 MINIMUM VEHICLE SPECIFICATIONS

Frame Section Modulus.....	18 in ³ (295 cm ³)
Frame Resisting Bending Moment	900,000 in-lbs (1020000 N-m)
Cab to Rear Axle Dimension	108 in (2.74 m)
GVWR.....	33,000 lbs (14970 kg)
GAWR (FRONT).....	12,000 lbs (5440 kg)
GAWR (REAR)	21,000 lbs (9520 kg)
Approximate Curb Weight for Stability with Dual A-Frame Outriggers.....	28,000 lbs (12700 kg)
Approximate Curb Weight for Stability with X-Frame and A-Frame Outriggers	26,500 lbs (12020 kg)
Approximate Curb Weight for Stability with Dual X-Frame Outriggers.....	25,000 lbs (11340 kg)

VO-355 AND VO-360 MINIMUM VEHICLE SPECIFICATIONS

Frame Section Modulus.....	18 in ³ (295 cm ³)
Frame Resisting Bending Moment	900,000 in-lbs (1020000 N-m)
Cab to Rear Axle Dimension	108 in (2.74 m)
GVWR.....	33,000 lbs (14970 kg)
GAWR (FRONT).....	12,000 lbs (5440 kg)
GAWR (REAR)	21,000 lbs (9520 kg)
Approximate Curb Weight for Stability with Dual A-Frame Outriggers.....	29,000 lbs (13150 kg)
Approximate Curb Weight for Stability with X-Frame and A-Frame Outriggers	27,500 lbs (12470 kg)
Approximate Curb Weight for Stability with Dual X-Frame Outriggers.....	26,000 lbs (11800 kg)

VO-350X, VO-355X, VO-360X MINIMUM VEHICLE SPECIFICATIONS – WITH STANDARD LOAD CHART

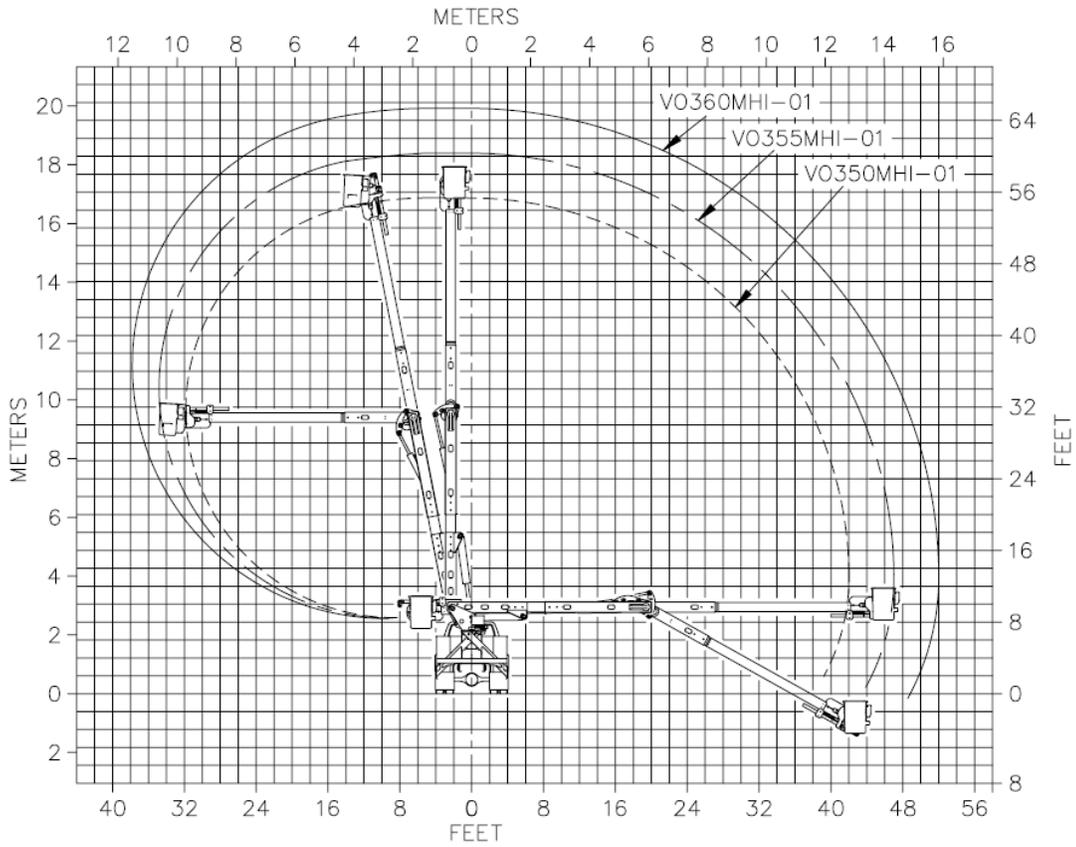
Frame Section Modulus.....	18 in ³ (295 cm ³)
Frame Resisting Bending Moment	900,000 in-lbs (1020000 N-m)
Cab to Rear Axle Dimension	108 in (2.74 m)
GVWR.....	33,000 lbs (14970 kg)
GAWR (FRONT).....	12,000 lbs (5440 kg)
GAWR (REAR)	21,000 lbs (9520 kg)
Approximate Curb Weight for Stability with X-Frame and A-Frame Outriggers.....	30,000 lbs (13600 kg)
Approximate Curb Weight for Stability with Dual X-Frame Outriggers.....	28,000 lbs (12700 kg)

VO-350X, VO-355X, VO-360X MINIMUM VEHICLE SPECIFICATIONS – WITH MAXIMUM LOAD CHART

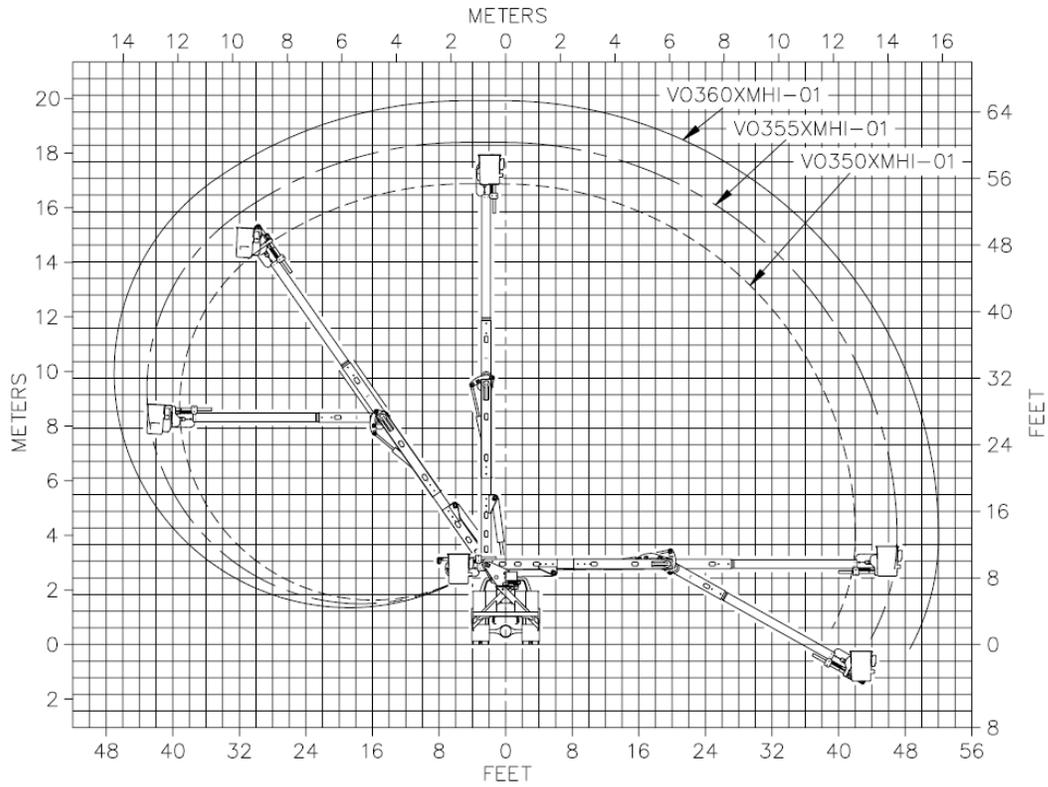
Frame Section Modulus.....	18 in ³ (295 cm ³)
Frame Resisting Bending Moment	900,000 in-lbs (1020000 N-m)
Cab to Rear Axle Dimension	108 in (2.74 m)
GVWR.....	36,000 lbs (16330 kg)
GAWR (FRONT).....	13,000 lbs (5900 kg)
GAWR (REAR)	23,000 lbs (10430 kg)
Approximate Curb Weight for Stability with Dual X-Frame Outriggers.....	30,000 lbs (13600 kg)

Notes:

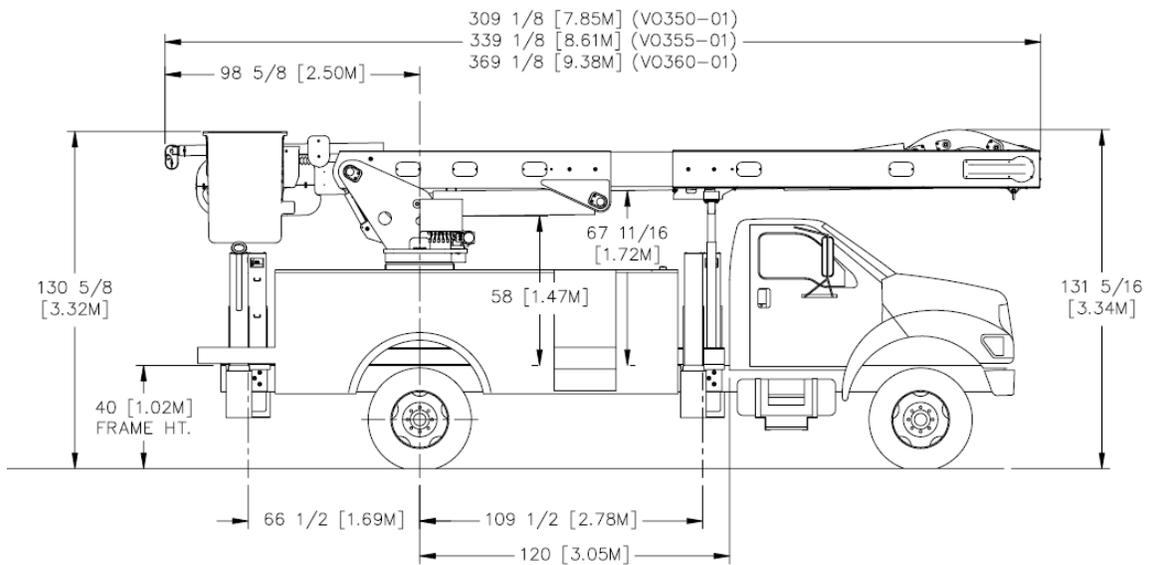
1. Actual GVWR and GAWR should be based on the weight and weight distribution of the chassis, body, lift ballast (if required), and accessories, plus the desired payload. Weights shown above are based on a typical installation on a 4x2 chassis.
2. Actual curb weight for stability will vary with rated platform capacity, mounting configuration, frame stiffness, and stability test requirements. The values provided are for reference only. The actual curb weight required to pass the ANSI A92.2 stability test may be higher or lower.



**REACH DIAGRAM
VO-350, VO-355, VO-360**



REACH DIAGRAM
VO-350X, VO-355X, VO-360X



OVERALL MOUNTED DRAWING
VO-350, VO-350X, VO-355, VO-355X, VO-360, VO-360X