

SPECIFICATIONS

GENERAL DESCRIPTION

The Arva Model PE-28 is a radio remote controlled four (4) section, full power, hydraulic crane, with a capacity of 14,000 lbs @8-12 ft radius and 4,500 lbs @ 40 ft. It has been designed for use on a tower structure, or can be used on a trolley in combination with tower structures. The crane is powered via an electric cable extending from the crane through the tower. One hundred thirty (130) feet of cable has been supplied to allow reach to the power source. The controls are radio remote on a hand held control box equipped with a waist belt. The remote control box can be stored in an access controlled container.

This crane is designed with a universal boom nose. There are interchangeable devices made to augment/enhance the cranes function.

CRANE DESCRIPTION

Controls

Radio remote controls are infinitely variable with manual control for emergency operation.

There is a two position rotary switch on the electrical panel located on the side of the turret, installed to limit operation from one control console at a time.

Controls have all function levers required for complete operation including optional equipment.

Boom Telescope

The boom is a four section telescopic and full hydraulic powered.

The four (4) boom sections are fabricated utilizing a rectangular box section design. The steel used in fabrication is designed for operation in cold ambient temperatures of -40E C. Boom is specifically configured for rotational torque (Manipulator attachment).

The boom extension cylinders are connected in a parallel circuit and are controlled by a single lever thereby eliminating the requirement for hose reels or feed festoons. A pilot operated double holding valve is incorporated in the boom extend/retract circuit. A double feed festoon is used to supply hydraulics for the optional manipulator functions. The festoon is removable when unit is used for crane applications.

The boom extension cylinders are sized to permit telescoping with rated load to maximum extension. Replaceable nylatron wear pads are used in each boom section.

Cylinders have holding valves to hold boom position at either positive or negative boom angles.

Boom Lift

The boom lift function is controlled by two (2) cylinders, vertically positioned, to give maximum clearance when handling loads with fully retracted -20E boom. The boom maximum lift angle is +52°

Holding valves are bolted to the cylinders to prevent accidental boom lowering due to hose or tube damage.

Swing

Crane rotation is 360° continuous. A ball type swing bearing used for turret rotation is driven by a low speed high torque motor which is directly coupled to the planetary gear reduction driving the large external gear on the slew bearing. Function speed is 1.5 rpm.

The slew bearing is a large diameter ball type bearing sized for sturdiness and long life. High strength bolts hold the upper turret structure to the shear ball bearing and to the base mount plate.

A fail safe hydraulically released spring applied disc brake is located between the motor and planetary reduction.

Boom Head

The boom head has positions for two sheaves with dead end for single, two or four part reeving. A pinned on boom head attachment must be removed if manipulator attachment is to be used.

Winch and Cable

The hoist is mounted on the bottom of the boom to permit use as a Tugger Winch without removal of crane boom. Hoist has planetary reduction dynamic braking with integral disc holding brake. The winch has 3,500 lb single line pull on fourth layer, equal speed, with maximum line speed of 250 fpm, 430 ft of ½" cable drum capacity, supplied with rotation resistant cable and cable follower.

Cable supplied is 430 ft of 1/2" 19 x 7 IWRC, with 10.8 ton breaking strength, rotation resistant RRL (right regular lay).

NOTE:

Hoist line pull may vary due to manufacturer's tolerance, oil viscosity and or oil temperature.

Hook Block

A 7 ½ ton hook block is supplied with the crane. It has two (2) sheaves for 4 part reeving.

Overhaul Ball

A three (3) ton capacity overhaul ball for single part reeving is supplied. A non-swivel hook is supplied with non-rotating type wire rope.

Load Monitor System

The load moment indicating system with warning and anti two block cut-off is incorporated into the crane controls. (see service package section of these manuals for more details)

Power Source

A 40 HP, 480V ac, motor drives the pressure and flow compensated pump. Pump supplies hydraulic power on demand. The oil reservoir is mounted above the pump. Power unit assembly with return filter, suction screen and breather is bolted to the crane turret. Electric slip ring assembly with hydraulic swivel for main power supply and optional trolley permits 360 degree (continuous) swing, located in swing bearing support structure.

Mounting

The crane base supplied for mounting on to either, pedestal mount, base mount, or trolley mount. Hydraulic swivel and valving is supplied for trolley application. It is interchangeable with model PE-58 crane. The top of base mount will accept either towers or cranes. The base mount is assembled utilizing pin and bolt design so that component parts may be shipped on standard highway trucks and assembled at customer site.

All base and diagonal members are square mechanical tubing. Tower/crane mounting is fabricated steel.

Base has provision for positioning of 14,000 lbs of concrete counterweight blocks (to be supplied by customer) on four (4) sides of base. Electric, hydraulic or mechanical quick disconnect couplings and lifting lugs (where required) are supplied for rapid relocation.

Counterweight

6,500 pounds of removable counterweight is supplied with the crane. It is removable for relocating the crane.

Hydraulic System

The hydraulic system consists of a pressure compensated load sensing variable displacement pump with a capacity of 25.5 GPM. Pump is driven by a 40 hp electric motor. The pump supplies oil flow to a directional control valve stack located on the side of the turret. It provides function and direction for the following; Swing, Boom extend retract, Boom lift, hoist, trolley, and manipulator functions. The functions may only be operated with the crane attached to an externally provided electrical power source.

Electrical System

The electrical control system is 24 volts DC. Main power is 480 Volt AC. There is an emergency start /stop button on the electrical panel on the side of the counterweight and on the radio control console, which stops the hydraulic pump motor and transformer for 24 volt DC control power.

WARNING

ELECTRICAL PANEL HAS DUAL VOLTAGE.

MANIPULATOR APPLICATION

NOTE

This is an optional piece of equipment and may not be supplied with your crane.

The crane with manipulator attachment is designed to pick up materials of various types and sizes weighing up to 4,000 pounds, from a vertical position on the ground, then raise and rotate in both vertical and horizontal directions, level and precisely position into place. Unit also has capability to retrieve material from location and lower to a pre determined location.

Manipulator Horizontal Rotation

The horizontal rotation is supported by a shear ball type bearing with external teeth which is driven by a 85 to 1 ratio worm gear. Power to rotate is supplied by a hydraulic gerotor style motor. As drive ratio is self locking a separate brake is not required. Function speed is infinitely variable.

Manipulator Vertical Rotation

The vertical rotation of the manipulator rotates on a large shear ball bearing with external spur gearing. Power is supplied by a gerotor style high torque hydraulic motor driving thru the 25.78 to 1 ratio planetary gear reduction with fail safe hydraulically released spring applied disc brake. Total gear reduction is 134.3 to 1.

Gear reduction output pinion meshes with gear teeth (spur gearing) on shear ball bearing. Rotation speed is infinitely variable.

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To prevent possible over running of function due to off centre loading on the function, a double acting pilot operated hydraulic over-centre valve is utilized in the motor drive circuit.

Manipulator Levelling Function

The levelling/angularity function is controlled by a hydraulic cylinder with a pilot operated holding valve on the pressure (rod) side of the cylinder. The function speed is infinitely variable. The function has capability of 20 degrees backward and 52 degrees forward motion when positioning loads overhead. Angles match boom angle.

TOWER AND PLATFORM

Tower mounting is for use with either Arva Crane model PE-28 or PE-58. The arrangement provides for a maximum of 120 feet of tower and when mounted on the base mount provides for approximately 130 ft to boom hinge pin height.

As the tower sections are also to be used as mid span track support, which must accommodate incremental heights; the arrangement consists of four (4) 20 ft sections, three (3) 10 ft section and two (2) five ft sections.

The tower sections have the same bolt together pattern as the bottom of the crane turret, top of trolley mount, and base mount for rapid assembly and/or removal.

Towers are fabricated using square mechanical tubing providing maximum crane stability. A caged ladder (bolt on)

1.4

is incorporated into each tower. Lifting eyes are installed (where required) on each piece for removing and re-installing, connection bolts are supplied.

TROLLEY AND RAILS **(To be determined)**

The trolley mount (optional) is for use with either Arva Crane model PE-28 or PE-58. Mounting arrangement is designed to permit quick removal or installation of crane for crane relocation.

Trolley travels on top of two (2) W36 x 150 side flange beams. Flat guide wheels prevent vertical lift of wheels and provide horizontal alignment. One set of vertical and horizontal guide wheels is used per trolley corner. Guide and hook rollers bolt to main trolley frame for rapid relocation.

Trolley has four wheel hydraulic drive with infinitely variable control from 0 to 50 fpm.

A four section gear type flow divider guarantees equal traction effort at all wheels. Hydraulic motors are fitted with fail safe hydraulically released spring applied brakes.

Travel power is supplied by crane power unit. Control is infinitely variable via radio remote control or manual levers mounted on crane.

Trolley frame is fabricated consisting of steel beams and plates. Trolley frame is fitted with 10,000 pounds of steel counterweight ballast. Additional concrete counterweight is to be supplied by customer.

NOTE

Maximum tower height, which may be used on trolley is 60 ft.

The rails (double `I` beam) arrangement to support either Arva Crane Model PE-28 or PE-58, is to be determined on application.

Crane trolley wheels are to contact wear strip on top of W36 x 150 lb beams. Inside rollers guide horizontal trolley travel. Bottom hook rollers to ride against bottom of inside top beam flange for additional ballast.

`I` beam arrangement to be fabricated in 40 ft long sections with provision to connect for spans of 80 ft and 120 ft. Beams have mating bolt pads on both ends. Diagonal and perpendicular members are welded into 36" x 150 lbs `I` beams, providing for rapid relocation.

Provision is made to anchor the beams to the wall or the end beam sections are to be counterweighted with 30,000 lbs of counterweight per end (supplied by customer, equal to approximately 8.5 cu. yards. of concrete, 4' x 6' x 10').

When used in 80 ft or 120 ft span configuration beams must be supported at mid point (40 ft or 60 ft respectively). Beams do not require mid support when used in 40 ft configuration.

Lifting eyes are installed to expedite relocating beams.

One tower assembly, is to be utilized as a twin mid beam support when trolley beam span is 80 or 120 ft long.

As crane trolley beams are spaced 10 ft apart two (2) support columns are required for hoisting on both sides (360 degrees) of crane trolley rail. One tower assembly 120 ft to be used for up to 60 ft high twin support columns.

In addition to the tower configuration described for 120 ft of tower consisting of four 20 ft sections, three 10 ft sections and two 5 ft sections, a base support section and an upper beam support section are required to have incremental adjustment to compensate for beam height.

The upper beam tower support section has a manual pull out section with pin locations allowing for 2 ½ ft adjustment in 6 inch increments. In addition, a manual screw is used to take up remaining clearance.

The base support will have 2 positions (rotated 90 degrees) providing 2 ½ ft and 5 ft height adjustment. Support column height to be determined prior to placing crane trolley support 'I' beams.

CONTROLS

Radio remote controls are infinitely variable with manual control for emergency operation.

There is a two position rotary switch on the electrical panel located on the side of the turret, installed to limit operation from one control console at a time.

Controls have all function levers required for complete operation including optional equipment.

DIMENSIONAL DATA

PE-28 CRANE

Working Radius:
Crane -153" to 477"

Height: Boom Horizontal
from bottom of base to top of
power unit 84"

Length:
Boom Horizontal Retracted -170"
Boom Horizontal Extended -41'-1"

Width: - 83 3/8" x 109 5/8"

Swing: - 360E Continuous

Crane Counterweight = 6,500 lbs.

MANIPULATOR

Without attachments = 30 1/2" high
= 38.8" wide
= 34" deep

TOWER & PLATFORM

(includes base)
Base Layout 18'7" square
5' high
Tower sections layout 54" square
Come in 5', 10' & 20' sections
Totalling 120' high
Platform access 11'-8" square
Handrail 360° @ 42" high

TROLLEY & RAILS

Trolley 24" high
Wheel base (TBD)
Wheel centers (TBD)

Rails 40' long typical section
120' total span ability
180" wide

PERFORMANCE DATA

PE-28 CRANE

Manual Revision E (04 02 04)

Boom Angle - Minus 20 deg.,
- Plus 52 deg.

Boom Luffing Time:
Up -14.62 sec
Down -15.1 sec

Boom Telescope:
Extend - 52.0 sec
Retract - 46.7 sec

Swing 360° (1.5 rpm):
Left - 1.58 rpm, 38 sec
Right - 1.59 rpm, 39 sec
Drive - Planetary Reduction

Hoist Speed @ 4 part reeve:
42' up 43.09 sec, 240 fpm
42' dn 42.8 sec, 244 fpm

NOTE:

See capacity chart for line pull.

MANIPULATOR

Horizontal Rotator Speed - rpm
Rotation - 360 deg. Limited

Vertical Rotator - 1/2 rpm

Rotator Vertical Speed - 1/2 rpm
Rotation - 230 deg. Limited
Drive - Planetary Reduction

Manipulator Angular Movement:
- plus 20 deg.,
- minus 50 deg.

COMPONENT WEIGHTS

Weight, Crane Assembly (including adapter base)
- A167012 Approximately 22,500 lbs

Weight, Crane w/Manipulator
- Approximately 24,000 lbs

Weight, Manipulator
- Approximately 1,500 lbs

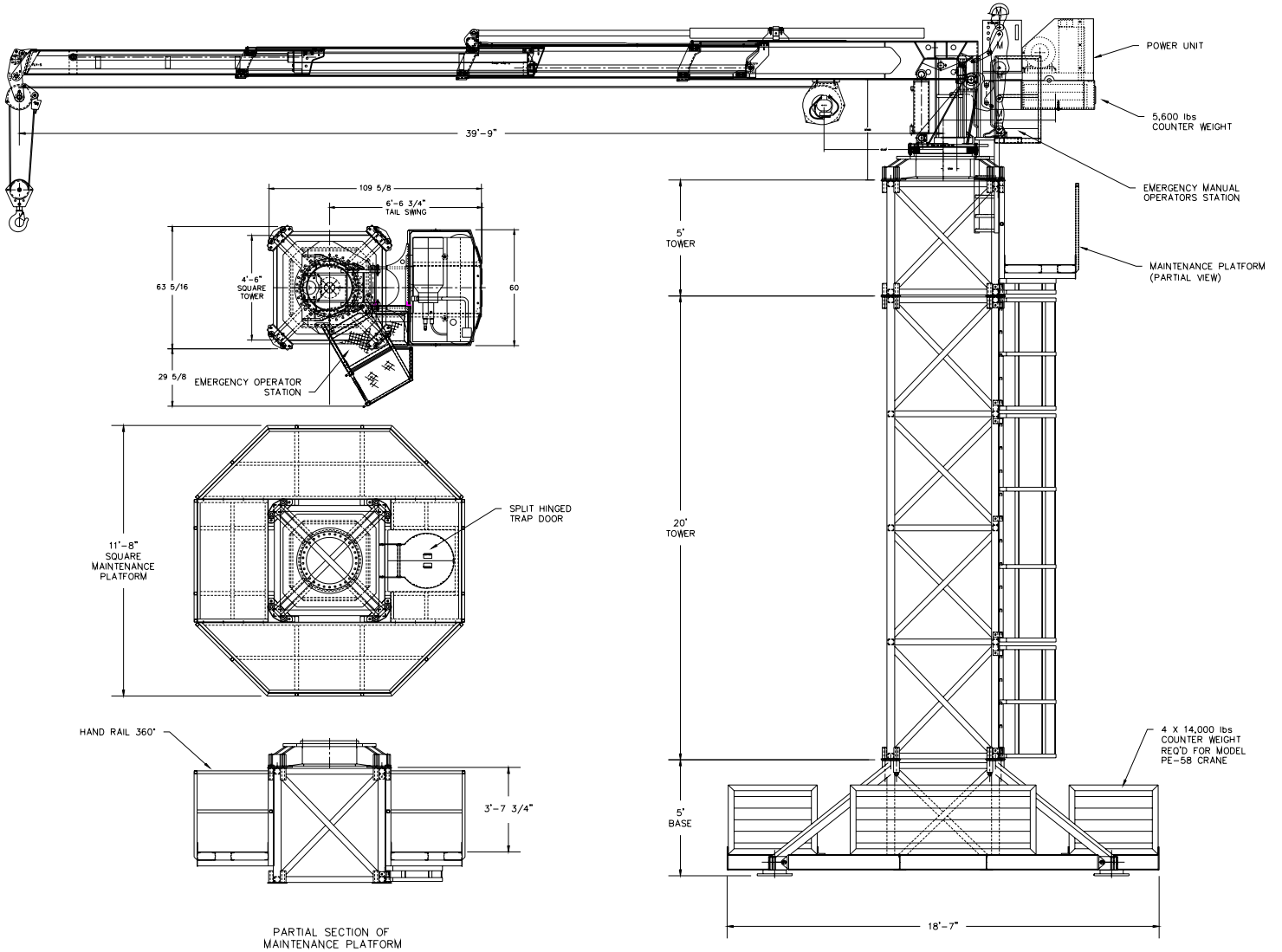
Weight, Base:
A167566 Central = 3,000 lbs
A167569 Side = 800 lbs
A167568 Horizontal = 750 lbs

Weight, Access Platform:
A167563 `A` (largest) = 850 lbs
A167564 `B` (no trap door) = 530 lbs
A167565 `C` (trap door) = 530 lbs

Weight, Tower Section;
A167556 20' section: 3,600 lbs
A167557 10' section 2,250 lbs
A167558 5' section: 1,150 lbs

Weight, Ladders;
A167559 10' ladder 210 lbs
A167560 5' ladder 130 lbs

CONFIGURATION



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