TRADITIONAL MANITOWOC

IDENTIFICATION AND LOCATION OF COMPONENTS

SERVICE TRAINING

P1773

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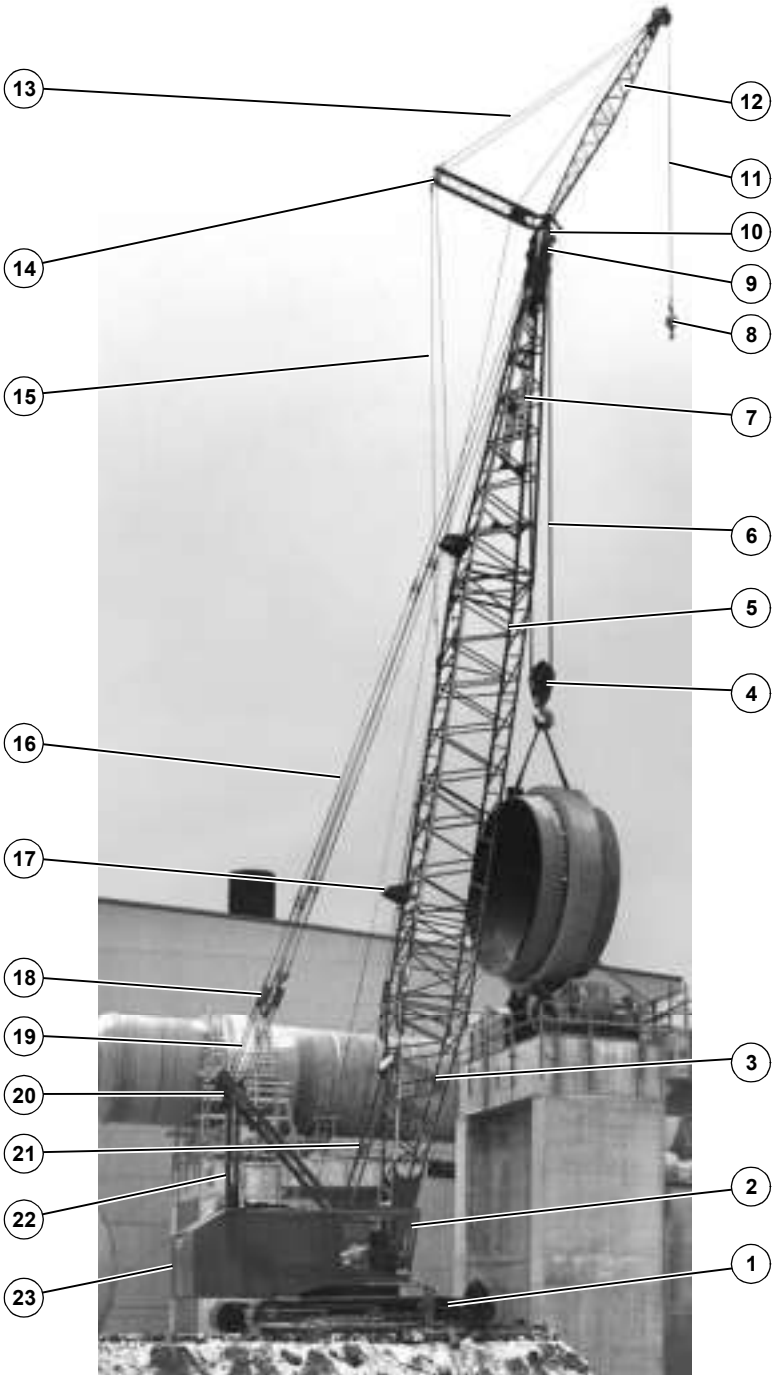
LIFTCRANE BOOM RIGGING



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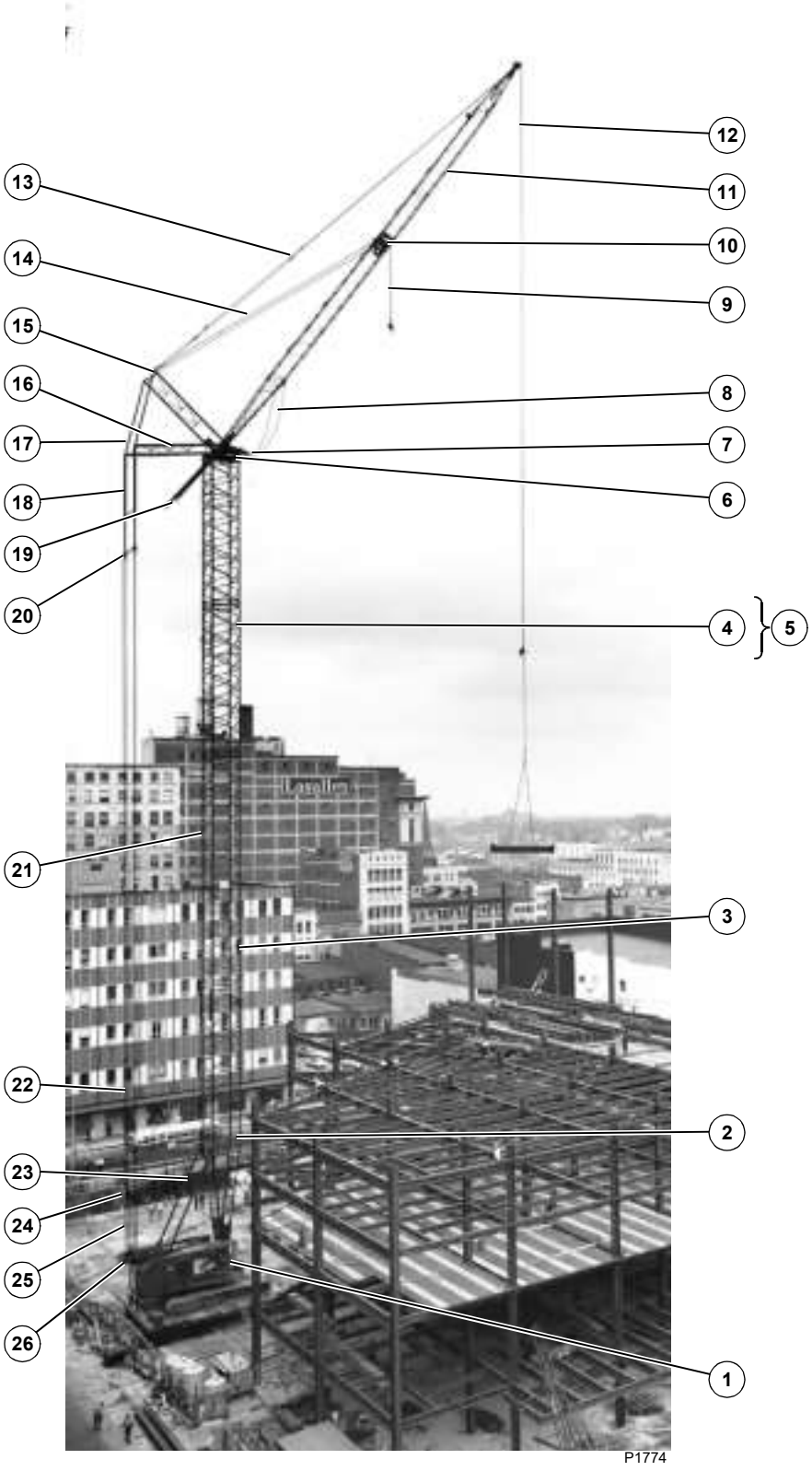
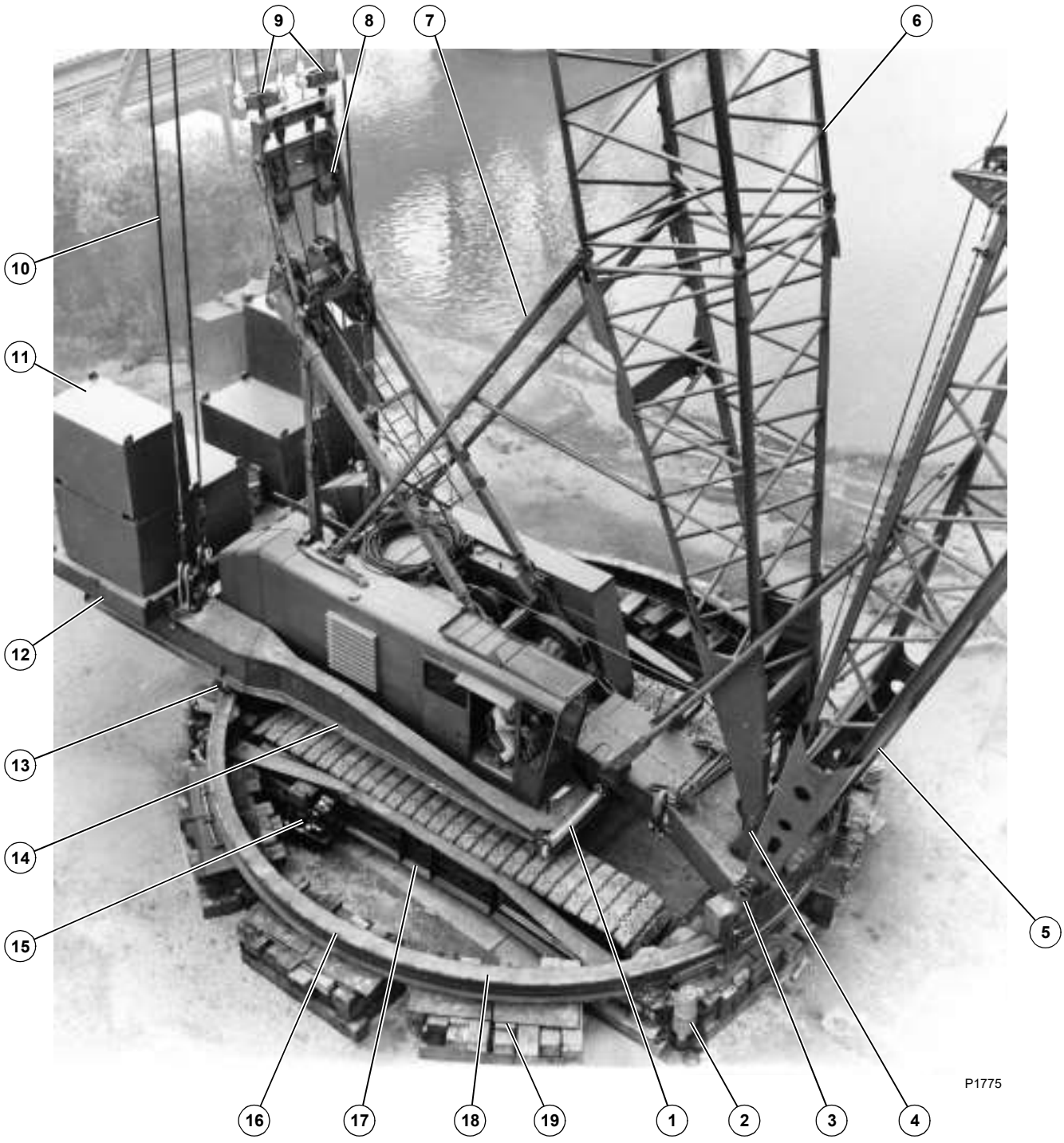
Item	Description
1	Lowerworks
2	Upperworks
3	Boom Butt
4	Load Block
5	Insert
6	Load Line
7	Boom Top
8	Hook and Weight Ball
9	Lower Boom Point
10	Jib Adapter or Upper Boom Point
11	Whip Line
12	Jib
13	Jib Pendants
14	Jib Strut
15	Jib Backstay Pendants
16	Boom Pendants
17	Wire Rope Guide
18	Equalizer
19	Boom Hoist Wire Rope
20	Gantry
21	Telescopic Boom Stops
22	Gantry Backhitch
23	Counterweights

TOWER CRANE RIGGING



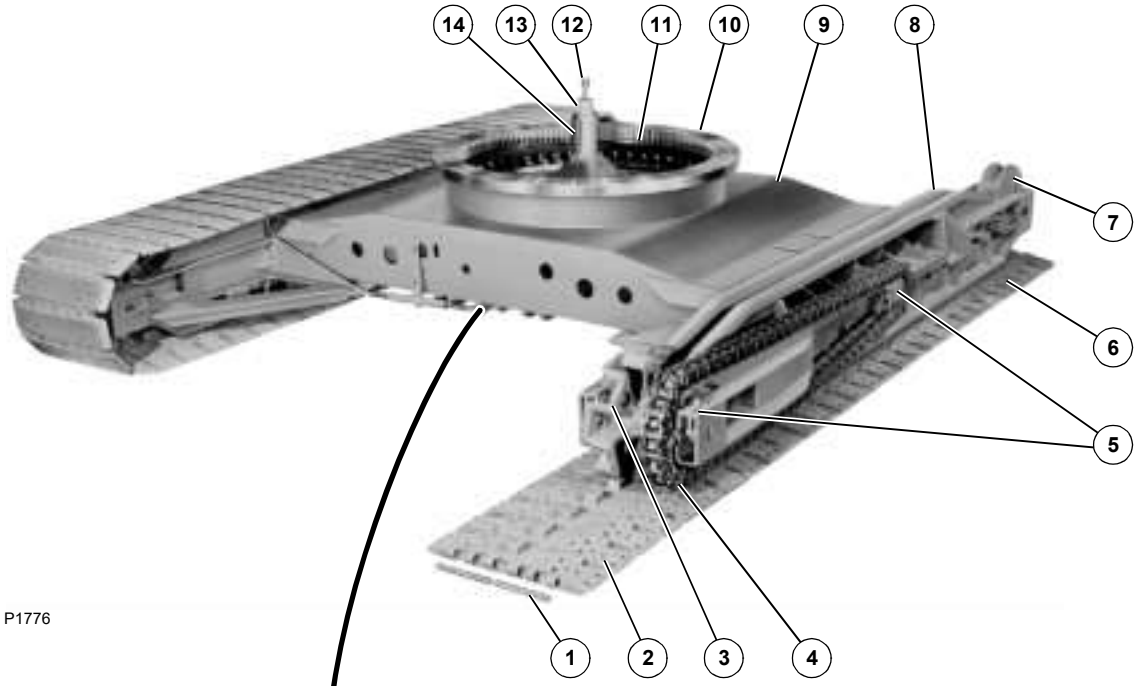
Item	Description
1	Holdback Assembly
2	Tower Butt
3	Boom Latch
4	Insert
5	Tower
6	Tower Cap
7	Boom Carrier
8	Boom Stop Pendants
9	Intermediate Fall Load Line
10	Intermediate Fall
11	Boom
12	Main Fall Load Line
13	Boom Pendants
14	Intermediate Suspension
15	Boom Strut
16	Intermediate Strut
17	Upper Straps
18	Lower Strap
19	Main Strut
20	Pendant Links
21	Outside Assist Lifting Bracket
22	Tower Pendants
23	Tower Backstay
24	Equalizer
25	Boom Hoist Wire Rope
26	Gantry

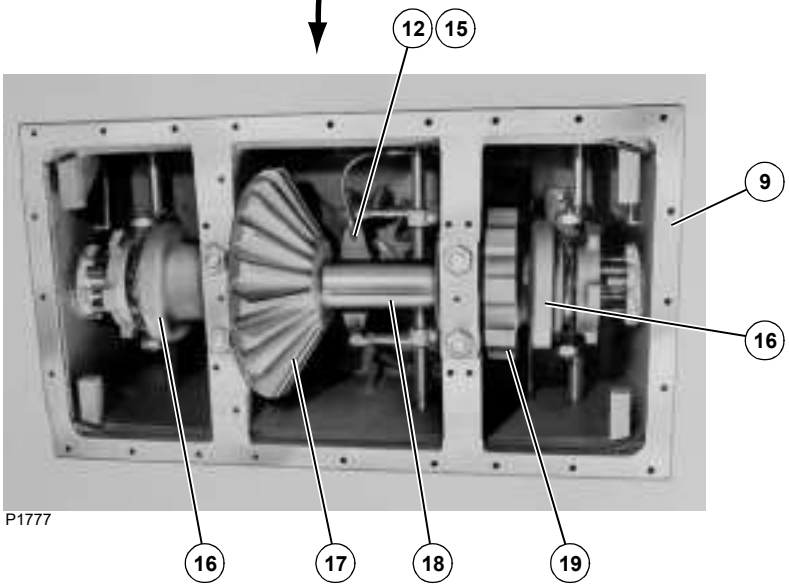
RINGER® RIGGING



Item	Description	Item	Description	Item	Description
1	Front Crossover Beam	8	Self-Erecting Equalizer	15	Hydraulic Jacking System
2	Hydraulic Jack	9	Backhitch Pendants	16	Ring
3	Boom Carrier	10	Counterweight Pendants	17	Ring Side Beam
4	Mast Support	11	Auxiliary Counterweight	18	Wear Plate
5	Boom	12	Counterweight Carrier	19	Wood Blocking
6	Mast	13	Counterweight Carrier Roller		
7	Mast Stop	14	Counterweight Carrier Side Beam		

LOWERWORKS

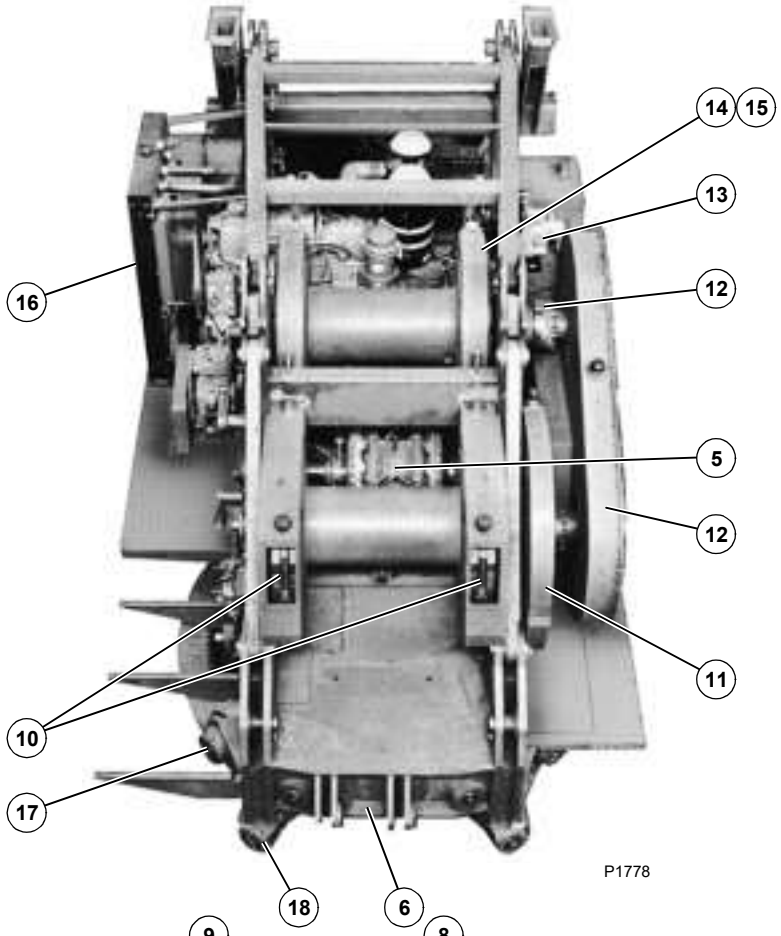




Item	Description	Item	Description	Item	Description
1	Tread Pins	8	Crawler Frame	15	Bevel Gear
2	Treads	9	Carbody	16	Steering Clutch
3	Tumbler	10	Roller Path	17	Bevel Pinion
4	Chain	11	Ring Gear	18	Horizontal Travel Shaft
5	Sprocket	12	Air Swivel	19	Travel Lock
6	Intermediate Roller	13	Vertical Travel Shaft		
7	Front Roller	14	King Pin		

UPPERWORKS (4100W)

Item	Description
1	Boom Hoist
2	Engine
3	Air Compressor
4	Independent Horizontal Swing Shaft
5	Main Drive Shaft
6	Rotating Bed
7	Front Drum
8	Drum Clutch
9	Rear Drum
10	Drum Brake (Both Drums)
11	Gear Case
12	Chain Cases
13	Boom Hoist Pump
14	Transmission
15	Converters
16	Radiator
17	House Roller
18	Hook Roller



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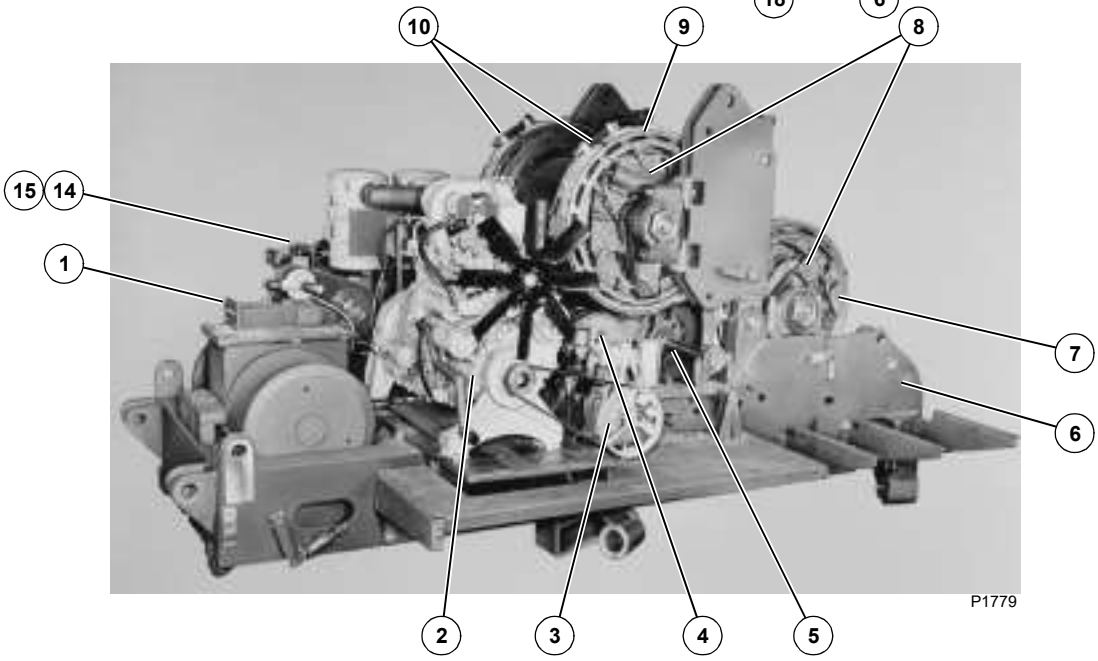

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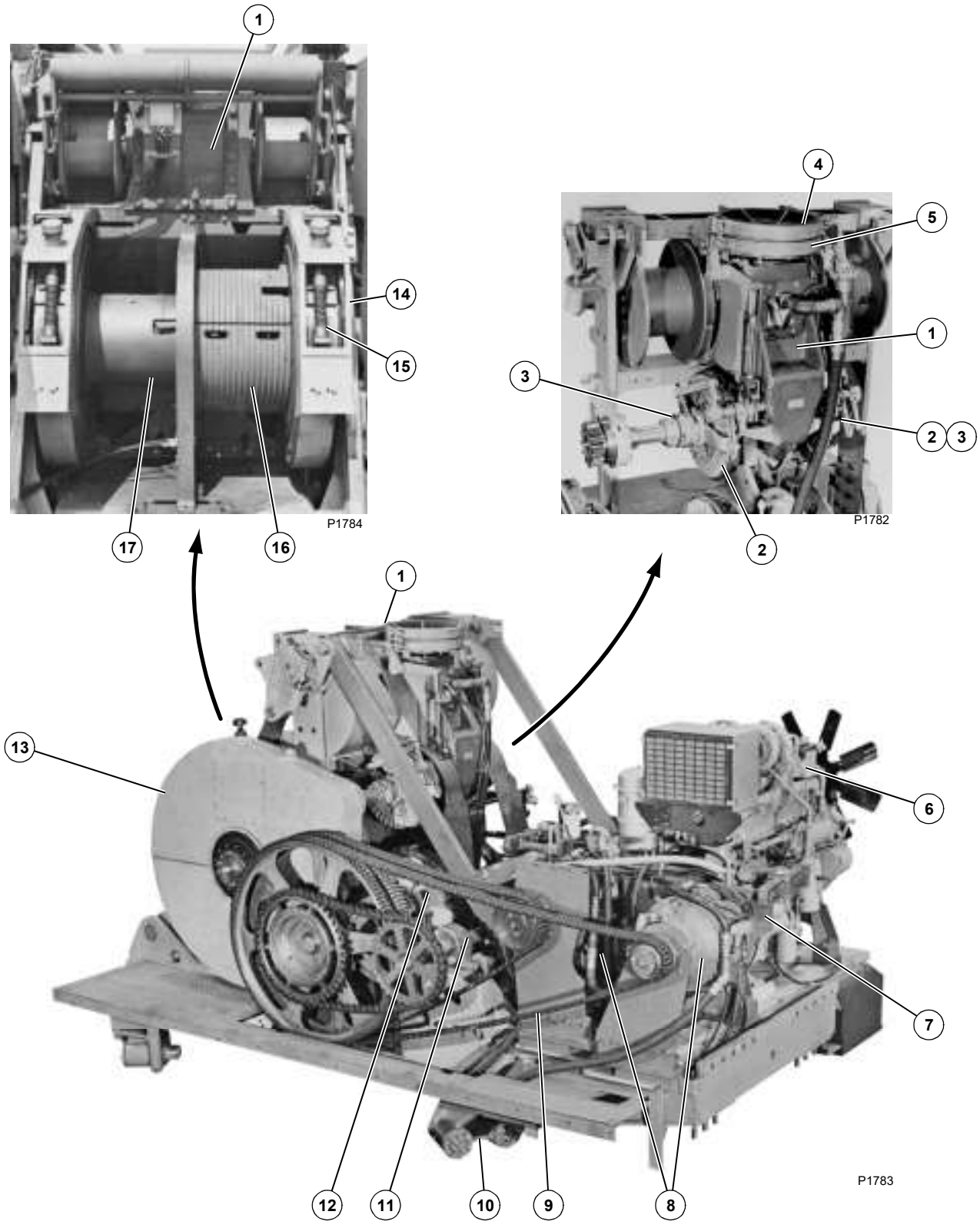
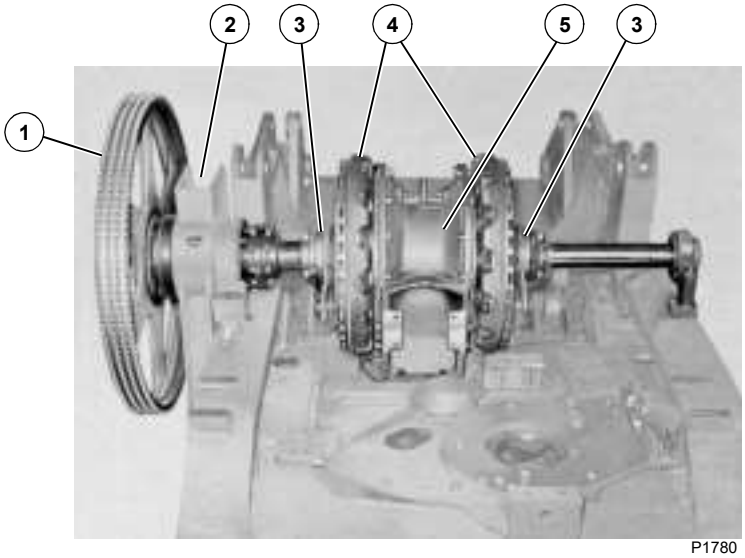
UPPERWORKS (3900)

Item	Description
1	Boom Hoist
2	Clutch with Spider, Discs, and Pressure Plate
3	Clutch Cams (stationary and moveable)
4	Auxiliary Boom Hoist Brake
5	Automatic Boom Hoist Brake
6	Engine
7	Transmission
8	Converters
9	Drive Chains (inside case)
10	Hook Rollers
11	Horizontal Independent Swing Shaft (see Page 10)
12	Main Drive Shaft (see Page 10)
13	Gear Case
14	Drum Clutch (internal, both drums)
15	Drum Brake (external, both drums)
16	Left Drum
17	Right Drum

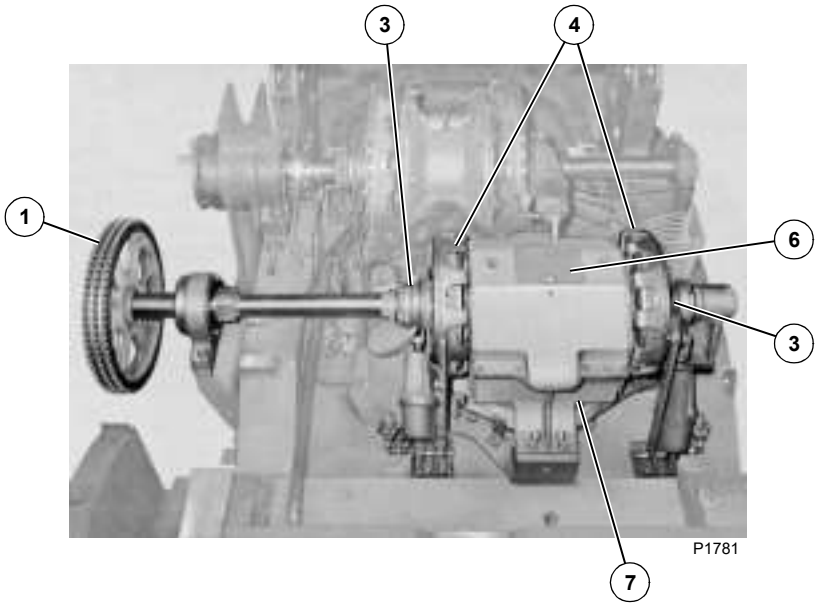
UPPERWORKS (3900)



MAIN DRIVE SHAFT



HORIZONTAL INDEPENDENT SWING SHAFT



Item	Description
1	Sprocket
2	Drum Drive Pinion
3	Clutch Cams (stationary and moveable)
4	Clutch with Spider, Discs, and Pressure Plate
5	Main Drive Shaft Center Housing with Bevel Gears and Pinion
6	Swing Shaft Center Housing with Bevel Gears and Pinion
7	Swing Brake

COMMON CRANE TERMS

ANSI B30.5

American National Standards Institute; safety code for crawler, locomotive, and truck cranes.

Attachment

Designation for front end equipment or any other device that may be added as a complete unit or assembly.

Automatic Boom Stop

Electric and air device which automatically stops boom at maximum operating angle.

Auxiliary Counterweight Pendants

Wire rope pendants between mast top and auxiliary counterweight carrier which transfer tension from boom to auxiliary counterweights.

Auxiliary Counterweights

Weighted boxes of cast concrete and/or steel billets which supplement weight of crane in providing lifting capacity.

Axis of Rotation

Vertical lines through axis around which crane upperworks rotates.

4-1/2 Offset Top

Open throat top with adapter links which permits greater clearance between load and boom.

Backhitch

Legs which support gantry and boom rigging and allow gantry to be raised and lowered.

Blocking System

Timber supports under complete ring assembly.

Boom

Open steel construction with tubular lacing between main corner members and consists of butt, top and inserts.

Boom Angle

Vertical angle between longitudinal centerline of boom and level.

Boom Carrier (Ringer)

Welded box section hinged to front of rotating bed which supports fixed mast and boom on ring with rollers.

Boom Carrier (Tower)

Centers boom hinge pin on tower cap to distribute load evenly on tower.

Boom Carrier Rollers

Rollers which support and rotate boom carrier on ring.

Boom Hoist

Two drums and worm gear drive which hauls in and pays out wire rope to control angle of boom.

Boom Latch

Device which locks boom to tower for raising and lowering operations.

Boom Point Elevation

Distance above a reference point — usually bottom of crawlers — to a main boom point.

Boom Rigging

Continuously reeved wire rope from boom hoist drums to equalizer and pendants for supporting boom and controlling boom angle.

Brake

Device for retarding or stopping motion by friction or power means.

Brake Band

Circular type, either external contracting or internal expanding, having a lining of heat and wear resistant friction material.

Bucket

Material container attached to machine by wire rope.

Cab

Housing which covers operator and/or machinery.

Carbody

Rigid steel base which supports upperworks and houses travel mechanism.

Clamshell Bucket

Bucket used with clamshell attachment.

Clamshell Crane

Crane with primary function to hoist and swing a clamshell type bucket at various radii.

Closing Line

Wire rope reeved from drum to control closing of clamshell bucket.

Clutch

Friction or mechanical locking device for engaging or disengaging power.

Clutch Band

Circular type, either external contracting or internal expanding, having a lining of heat and wear resistant friction material.

Controls

Levers, switches and pedals for controlling crane operation.

Counterweight

Additional machine weight to provide stability for lifting loads and attached to rear of upperworks.

Counterweight Carrier (Ringer)

Supports auxiliary counterweights fastened at rear of crane.

Counterweight Carrier Rollers (Ringer)

Antifriction bearings which support and rotate counterweight carrier on ring.

Crane Operator

Person who is qualified to operate crane.

Crawler Side Frames

Steel frame which provides support for crawler tread belt.

Crawler Sprocket

Transmits power from horizontal drive shaft to crawler drive chain which drives crawler tumbler.

Crawler Tread Belt

Assembled crawler treads and connecting pins around crawler frame which contact ground.

Crawler Tumbler

Transmits power from drive chain to crawler tread belt.

Dragline Bucket

Bucket used with dragline attachment.

Dragline Crane

Crane with a primary function to hoist and swing a dragline type bucket at various radii.

Drum

Rotating cylinder with side flanges on which wire rope is spooled.

Dynamic Loads

Loads introduced into crane by forces in motion.

Equalizer

Frame with sheaves which connects boom hoist wire rope and fixed pendants to boom.

Fairlead

Device to guide wire rope for proper spooling onto drums.

Front Crawler Roller

Guides crawler treads around crawler side frame.

Gantry

Frame pinned to upperworks which supports boom hoist wire rope.

Gantry Lifting Device

Electric and hydraulic device used to raise and lower gantry.

Gradeability

Percent slope which a machine can climb.

Hammerhead Top

Boom top with both hoist and boom suspension lines offset from centerline of boom for load clearance.

Hoist Line

Multiple part wire rope suspended from boom to load block.

Hoist Speed

Speed, in feet per minute, that hoist block travels.

Holding Line

Wire rope reeved from drum for holding clamshell bucket suspended during dumping.

Hook Rollers (Crane)

Rollers which prevent lifting of upperworks from lowerworks.

Hook Rollers (Ringer)

Rollers which prevent lifting of boom carrier from ring.

House Rollers

Rollers which support and rotate upperworks on carbody.

Hydraulic Jacking System

Self contained engine driven pump, controls, and hydraulic jacks used only to level ring and crane, not to support load.

Intermediate Fall

Additional load line at intermediate position of tower crane boom for minimum radius.

Intermediate Suspension

Pendant between boom strut and intermediate fall which provides additional boom support.

Jib

Boom attachment which extends reach of boom for handling light loads at increased heights and radii.

King Pin

Vertical shaft which acts as rotation centering device for revolving upperworks on carbody.

Level

True horizontal plane.

Liftcrane

Crane with primary function to hoist, travel and swing loads at various radii.

Lifting Capacities

Crane hoist ratings established by manufacturer.

Light Tapered Top

Boom top made of lighter chord and lacing material for handling lighter loads at maximum radius.

Load Block

Assembly consisting of frame, sheaves, and hook which provides multiple part hoist reeving and load attachment.

Load Line Reeving

Wire rope around drums and sheaves for hoisting loads.

Lowerworks

Ring gear, roller path, carbody, crawlers and gear trains for swing and travel operation.

Main Drive Shaft

Transmits power from torque converters to drums, swing shafts, and travel shafts.

Mast (Ringer)

Transfers lifted load stresses from boom to auxiliary counterweights and crane.

Mast Backhitch Pendants

Wire rope pendants between mast top and crane which transfer tension from mast to crane.

Mast Backstay Struts

Support mast when boom hoist wire rope is slack.

Open Throat Top

Tapered boom top which permits load to hang under boom for minimum radius.

Operating Radii

Horizontal distance measured from crane axis of rotation to center of vertical hoist lines.

Pendant

Supporting wire rope which maintains constant distance between two components connected by pendant.

Power Lowering

Hydraulic driven mechanism which drives hoist drums in reverse direction to lower light loads.

Ringer

Crane attachment which moves “tipping fulcrum” forward of standard crane which results in higher lift capacities.

Ring Gear

Gear teeth cut into roller path which swing pinion meshes with to provide swing motion.

Ring Segments (Ringer)

Weldments bolted together to form circular roller path on which boom carrier and auxiliary counterweights rotate.

Self-Erecting Rigging (Ringer)

Wire rope and equalizer used to raise and lower mast with crane drum.

Roller Path

Circular steel surface which house and hook rollers rotate on.

Rotating Bed

Rigid steel deck on which upper machinery is mounted and front end attachment is connected.

Screw Jacks (Ringer)

Adjustable vertical shafts fastened to ring side beams to support ring assembly.

Screw Jack Pads

Square metal weldments connected to end of screw jacks which support ring assembly on ground.

Split Drum Shaft

Two independently controlled drums mounted side-by-side on same shaft.

Stability

Ability of crane to resist tipping.

Structural Competence

Ability of machine and its components to withstand stresses imposed by applied loads.

Swing Lock

Mechanical device which engages ring gear to prevent upperworks from swinging.

Swing Shaft (Horizontal)

Transmits engine power to vertical swing shaft(s) through bevel gear and clutch arrangement.

Swing Shaft(s) (Vertical)

Connected to bevel gears on horizontal swing shaft to drive swing pinion which meshes with ring gear.

Swing Speed

Speed, in revolutions per minute, that upperworks rotates.

Tagline

Wire rope attached to load to help control load from auxiliary drum.

Tandem Drum Shafts

Two independently controlled drums mounted on separate front and rear shafts.

Telescopic Boom Stop

Telescoping tubes which physically stop boom at highest recommended angle.

Torque Converter

Hydraulic coupling connected to engine which increases engine torque as load increases with a corresponding decrease in speed.

Tower Attachment

Attachment adaptable to basic crane consisting of vertical tower with luffing boom attached to tower cap.

Tower Backstay

Struts which support vertical position of tower.

Tower Cap

Provides hinge point between tower and luffing boom.

Tower Holdback

Wire rope device to assist raising and lowering tower.

Tower Struts

Pinned to tower cap to provide connection between boom pendants and tower pendants.

Transmission

Gear box which transmits power from engine to converters and pumps which drive crane machinery.

Travel and Steering Jaw Clutches

Mechanical locking clutches for transferring power from upperworks to lowerworks for travel and steering operation.

Travel Locks

Mechanical device which holds crane stationary by locking crawlers.

Travel Shafts

Vertical and horizontal gear shafts which transfer travel power from main drive shaft to crawlers.

Travel Speed

Speed, in miles per hour, that crane travels.

Truck Crane

Crane upperworks mounted on independent engine-driven rubber-tire carrier.

Upper Boom Point

Sheave assembly at boom top for additional hoist line.

Upperworks

Rotating bed, engine, gear train, and controls for powering and controlling crane operation.

VICON

Variable independent control through patented torque converters which provide precise operator control of rated loads.

Wear Plates (Ringer)

Plates fastened to top of ring segments for function wear from boom carrier and auxiliary counterweight rollers.

Whip Line

Secondary hoist line used on jib or upper boom point.

Wire Rope

Flexible, multi-wired member usually consisting of core member around which a number of multi-wired strands are wound.

Wire Rope Guide

Sheaves which guide wire rope to hoist drums.

Wire Rope Roller Guide

Roller which prevents wire rope from rubbing against boom and other parts.

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