71H Pipelayer

Engine

Engine Model	CAT® C7.1 ACERT™	
Net Power - ISO 9249	124 kW	166 hp

Weights

Operating Weight	21 727 Kg	(47, 900 lb.)

Lift Capacity

Lift Capacity at Tipping Point - ISO 8813

27 215 Kg	(60,000 lb.)

PipeLine Machinery

Your Global Partner for Pipeline Solutions

PLM presents the 71H Pipelayer – Caterpillar® quality without compromise.

Power Productivity
Standard electro-hydraulic tractor control help improve precision and response. Dedicated hydraulics, differential steering and machine control systems aid overall productivity.

Integrated, Durable Components
Boom and hook draw works are driven by independent hydraulic winches. The compact design of the counterweight provides maximum lift capability and optimum weight distribution. The drawbar is able to accommodate a wide range of attachments.

Engine and Emissions Technology
The Cat® C7.1 ACERT™ engine meets worldwide emission standards while providing outstanding engine performance, fuel efficiency and long-term durability.

Serviceability and Customer Support
Knowledgeable product support team to assist with equipment guidance, purpose-built parts supply and coordination of local Cat dealer service.

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Pipeline Machinery International (PLM) has developed a pipelaying solution to enhance its pipelayer offerings. With the support of Caterpillar and the engineering expertise of Vanguard Equipment Inc., the challenge was met to create a utility-capacity pipelayer in the Tier 4 Final / Stage IV emissions class, designed for lifting 27 215 kg (60,000 lb.) and engineered to meet the most exacting standards in the world.

The 71H combines the proven capabilities of the Cat® D6N base tractor with Vanguard design in sideboom systems. Vanguard has many years experience with pipelayer design (including the Cat 572R, 561M and 72H) and the manufacture of hydraulic pipelayer attachments and welding systems for Caterpillar and PLM.

Pipelayer

Integrated, robust components

Winches

Boom and hook draw works are driven by independent hydraulic winches. Oil-disc brakes provide smooth operation and positive retention of boom and hook positions. A modular design allows for fast replacement, easy field service and testing. Centralized hydraulic test ports assist with troubleshooting. Infinitely variable speed controls for boom and hook allow for precise operator control. Emergency quick drop function on load line control allows the operator to drop the load quickly.

Counterweight

Hydraulically extended counterweight provides smooth, controlled weight-balance adjustment. The compact design of the counterweight provides maximum lift capability and optimum weight distribution. Dual action hydraulic counterweight relief valves provide added protection for personnel during operations and servicing activities. A manual mechanical safety lock ensures secure lock-out for worry free servicing.

Blocks & Hook

The heavy-lifting components include hook and boom blocks with sleeve bearings, a forged hook with latch and ductile iron sheaves. The high-performance cable enhances flexibility, strength and crush resistance.

Drawbar

The robust drawbar is able to accommodate a wide range of attachments. The solid, frame-bolted design is secure for train attachment or anchor tractor use.

Boom

The light weight, durable boom features high tensile strength steel construction for narrow structures and maximum visibility to the work area. Replacement boom-mount bearings aid serviceability and long life. A 6.1 m (20 ft.) boom is standard with large box section.

Implement and Steering Controls

Ergonomically Designed for Ease of Operation

Pipelayer Control

Dual control leavers place all of the boom and hook function controls in one hand.

Quick Drop Control

When activated, the quick drop control will allow the load on the hook to free fall to the ground. This control is only for use in emergency situations where the load must be released immediately.

Throttle Rocker Switch

Press the Throttle Rocker switch, it will adjust the engine speed to high or low idle. Press and hold until desired engine speed is attained and then release, the machine will maintain this new chosen speed.

Steering and Transmission Control

The electro-hydraulic differential steering controls the direction and degree of turns, forward-reverse shifting, and gear selection in a single control handle, all enhancing operator comfort. The handle is ergonomically designed to reduce operator fatigue. The thumb roller on the steering control shifts the electronically controlled power shift transmission, while the FNR switch controls the machine travel direction. The tiller allows the operator to work precisely in close areas – around the ditch, ROW stakes and other machines.

Instrument Panel and Cat Monitoring System

The 71H features an in-dash display with new functionalities. The advanced monitoring system tracks the machine operating conditions in real time. The monitoring system display is illuminated for excellent visibility in low light and is glare resistant for easier view in bright light. It also includes controls for brightness and contrast.

Optional Forced-Air Heater

An optional forced-air heater is available for added operator comfort in colder weather.

Engine and Power Train

Powerful Efficiency

Engine

The 71H pipelayer features a Cat C7.1 ACERT™ engine and a Cat Clean Emission Module to deliver the performance that customers demand, while meeting U.S. Tier 4 Final / StageIV emission standards.

The ACERT Technology features advanced electronic control, precision fuel delivery, refined air management and aftertreatment technologies.

High Efficiency Torque Divider

The torque divider acts as a hydrodynamic component between the engine and transmission to provide high multiplication of torque and attain the best combination of operating efficiency and driveline reliability.

Differential Steering System

Differential steering maintains full power to both tracks to provide superior controllability. When one track speeds up, the other slows down an equal amount. Maneuverability – especially with large hook loads – is improved. Greater load capacity, power and speed control are possible in soft underfoot conditions on steep slopes because both LGP tracks are powered during turns. Low effort tiller bar, touch shift control and steering modulation ensure ease of operation.

Emissions Technology

Proven, integrated solutions

Emissions reduction technology on the D6N is designed to be transparent, with no action required from the operator. Low temperature regeneration runs automatically in the background while you work.

Aftertreatment Technologies

To meet the additional 80 percent reduction in NO_X emissions required by Tier 4 Final/Stage IV emission standards, Caterpillar engineers added Selective Catalytic Reduction (SCR) to the already proven aftertreatment solution.

Diesel Exhaust Fluid

Selective Catalytic Reduction utilizes Diesel Exhaust Fluid (DEF), which can be conveniently refilled when you refuel. The DEF fill nozzle is located next to the fuel tank, with easy access via a rear step. A tone will sound (with key on), when the tank is nearly full and a gauge on the dash shows your fluid level. The system is designed to use one tank of DEF for each tank of fuel (1:1 DEF fill ratio).

The D6N typically has used DEF at a rate of 2-3 percent of fuel consumption.

When the machine is turned off, a pump will automatically purge the DEF lines to help prevent freezing. A symbol on the dash and a light/symbol on the Ground Level Service Center indicate when the purge is complete and that it is safe to turn off the electrical disconnect. If the engine/aftertreatment temperatures are high, a Delayed Engine Shutdown will activate automatically to cool the machine and then purge the lines. For complete aftertreatment information, please refer to your machine's Operation and Maintenance Manual.

The 71H main frame is engineered to handle the unique demands of the pipelaying operation.

The final drives are elevated well above the ground level work area to protect them from impact loads, abrasion and contaminants.

Caterpillar uses robotic welding techniques in the assembly of the case and frames. The deep penetration and consistency of robotic welding insures quality for long life and durability.

Structure and Undercarriage

Underlying Strength, engineered for performance

The 71H pipelayer features the elevated sprocket design that isolates final drives, axles, and steering components from harsh impacts. The modular design aids to reduce maintenance costs.

In addition, the pipelayer lifting loads are anchored across the complete track frame cross-section, for superior strength distribution.

Heavy Duty Undercarriage

Heavy duty undercarriage is well-suited to aggressive applications like side-slopes, pipeline construction or working in rocky or uneven terrain. Components are designed for extended wear life and abrasive conditions and high impact applications.

- Fixed track frames ensure rigid stability for lifting operations.
- 600 mm (24 in) single grouser shoe, LGP guage.
- Hydraulic track-adjusters used to maintain correct track tension.
- Segmented sprocket sections for easy replacement and servicing.
- Modular design aids serviceability to help reduce maintenance costs.

Cooling System

Durable and Efficient

The engine radiator, Air To Air After Cooler (ATAAC), and hydraulic oil cooler are packaged in a single plane. Aluminum bar plate construction provides durability and allows for higher heat transfer and superior corrosion resistance.

The engine mounted demand fan provides engine cooling capability that is matched to the ambient conditions. Fan speed is adapted to the cooling load and reduced when it is not needed to save fuel.

A standard manual reversible fan (only available as direct drive) allows fan blades to be reversed manually to get opposite cooling air flow when ambient temperature is low.

A sand blast grid can be located between radiator and fan and protects radiator from abrasive materials and debris.

The new engine air filter strategy includes a cyclone pre-cleaner that can be cleaned up several times simply with pressurized air.

Safety

Designed with Protection in Mind

Job site safety is a key concern for pipeline customers, and the 71H pipelayers are designed with features to help protect people in and around the machine.

- Roll Over Protective Structure (ROPS) provides the operator protection in the event of a machine rollover.
- Quick drop release on load line control allows the operator to drop the load quickly.
- Additional mirrors provide even greater visibility around the machine.
- Load Monitor Indicator (LMI) ready to help operators monitor loads for enhanced job-site safety and efficiency.
- Boom and hook drawworks are driven by independent hydraulic winches.
- Oil disc brakes provide smooth operation, positive retention of boom and hook positions
- Infinitely variable speed controls for both boom and hook allow precise control.
- Hydraulic boom stop valve provides proven, reliable automatic safety stop function to prevent overloading of key machine components.

Integrated Technology

Solutions to make work easier and more efficient

Cat Product Link™*

Remote monitoring with Product Link improves overall fleet management effectiveness. Product Link is deeply integrated into machine systems. Events and diagnostic codes, as well as hours, fuel, idle time and other detailed information are transmitted to a secure web based application, VisionLink™. VisionLink includes powerful tools to convey information to users and dealers, including mapping, working and idle time, fuel level and more.

Sustainability

Thinking generations ahead

The 71H is designed to benefit your business and reduce emissions:

- Meets U.S. Tier 4 Final/Stage IV emission standards.
- Fuel efficient engine, and features like a hydraulic demand fan, help decrease overall fuel consumption.
- Technologies like Product Link help improve overall efficiency, saving fuel and fluids, as well as wear and tear on equipment.
- Grab handles, steps, lighting packages and ground level service center help enhance job-site safety.
- Major components are built to be rebuilt, eliminating waste and saving money by giving the machine and/or major components a second – and even third – life.

Serviceability and Customer Support

When uptime counts

Accessible, Quick and Easy Maintenance
Hinged engine doors provide easy access to grouped maintenance points. The engine air filter can be easily removed for inspection. A standard electric priming pump reduces efforts and time to prime the system. Service doors on the rear provide easy access to grouped pressure taps for quick testing of the Hydraulic system. A grease gun holder is located on the rear compartment.

Access / Egress
Ladders and steps are designed for pipelayer operations offering safe and easy access/egress for the operator and service personnel. An Operator Presence Detection system allows the machine to idle when an operator is not in the seat. The system locks out the powertrain so any unintentional movements during ingress or egress will not physically move the machine.

Maintenance Monitoring
Diagnostic connectors allow Cat dealers to quickly troubleshoot the machine. The flexible monitoring system offers more diagnostic capabilities like the engine oil low level. These features are backed up by the Product Link.

Renowned Cat Dealer Support
From helping your selection of the right machine to knowledgeable ongoing support, PLM and the Cat dealer network provide the best in sales and service. With knowledgeable, pipeline industry experience, the PLM team are there – around the corner and around the world – helping the pipeline construction contractor with equipment advice, specialty parts supply and coordination of local service and parts support.

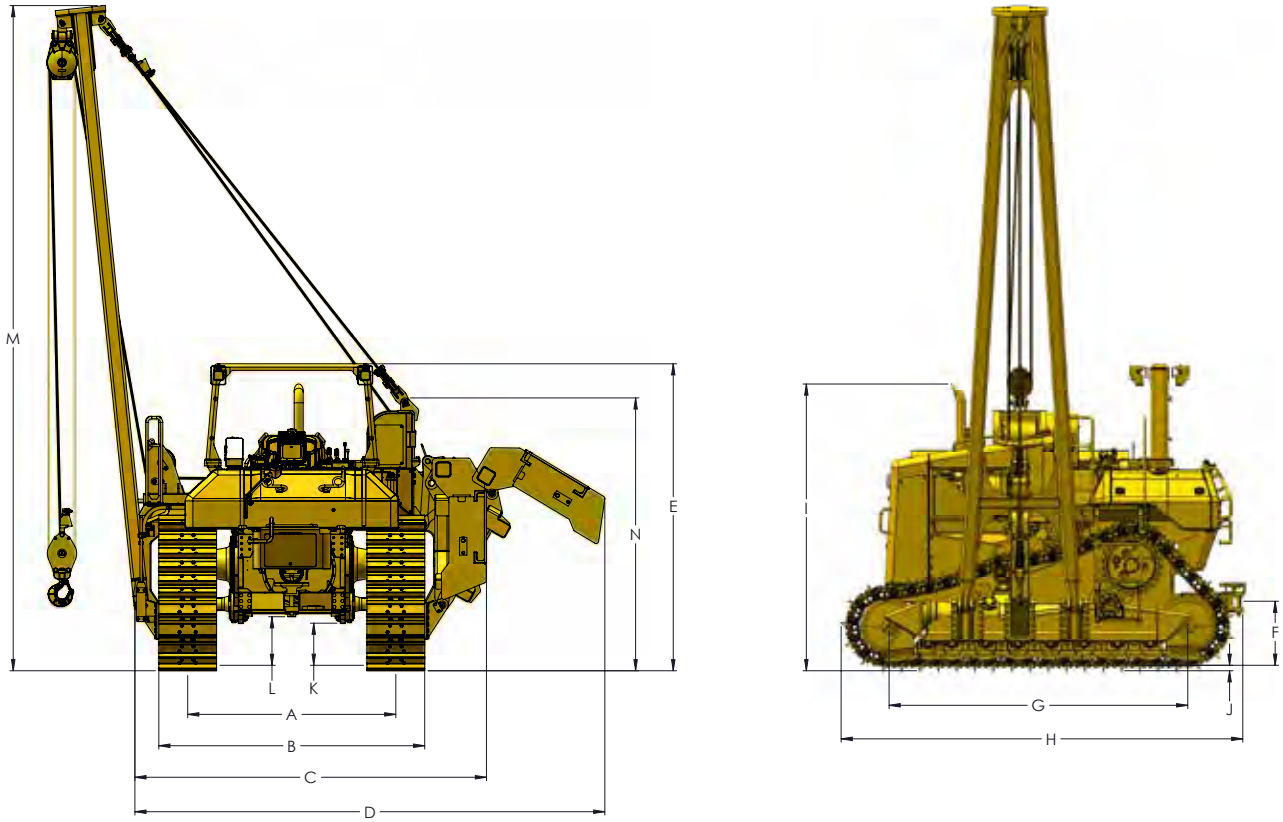
71H pipelayer replacement parts are available through the PLM purpose-built parts department and are made available to the entire Cat dealer network.

Engine Specifications

Engine		
Engine Model	Cat® C7.1 ACERT™	
Global Emissions	U.S. Tier 4 Final / Stage IV Korea Tier 4 Final	
Engine Power (Maximum) @2,200 rpm		
SAE J1995	136 k W	182 hp
SO 14396	133 k W	178 hp
ISO 14396 (DIN)		180 hp
Net Power @1,800 rpm		
ISO 9249/SAE J1349	124 k W	166 hp
ISO 9249/SAE J1349 (DIN)		168 hp
Bore	105 mm	4.1 in.
Stroke	135 mm	5.3 in.
Displacement	7.1 L	433 in^3

- Net power advertised is the power available at the engine flywheel when the engine is equipped with the air cleaner, muffler, alternator, cooling fan at maximum speed.
- No derating required up to 3000 m (9,840 ft) altitude, beyond 3000 m (9,840 ft) automatic derating occurs.
- All non-road Tier 4 Interim and Final, Stage IIIB and IV, and Korea Tier 4 Final diesel engines are required to use only Ultra Low Sulfur Diesel (ULSD) fuels containing 15 ppm EPA/10 ppm EU (mg/kg) sulfur or less. Biodiesel blends up to B20 (20% blend by volume) are acceptable when blended with 15 ppm (mg/kg) sulfur or less ULSD. B20 should meet ASTM D7467 specification (biodiesel blend stock should meet Cat biodiesel spec, ASTM D6751 or EN 14214). Cat DEO-ULS™ or oils that meet the Cat ECF-3, API CJ-4, and ACEA E9 specification are required. Consult your OMM for further machine specific fuel recommendations.
- Diesel Exhaust Fluid (DEF) used in Cat Selective Catalytic Reduction (SCR) systems must meet the requirements outlined in the International Organization for Standardization (ISO) standard 22241.

71H Specifications



DIMENSION	DESCRIPTION	MILLIMETERS	INCHES
A	Track Guage	2162	85.1
B	Width of Tractor (600 mm [23.6 in.] shoes)	2762	108.7
C	Width of machine - boom removed	3658	144.0
D	Width of machine - counterweight extended	4882	192.2
E	Machine height - tip of grouser to top of ROPS	3200	126.0
F	Drawbar height - ground face of shoe to center of clevis	668	26.3
G	Length of track on ground	3116	122.7
H	Length of basic tractor with drawbar	4146	163.2
I	Height over stack from tip of grouser	3046	119.9
J	Grouser height	57	2.2
K	Ground clearance - lowest point on frame to ground face of shoe	440	17.3
L	Ground clearance (SAE J1234)	507	20.0
M	Boom height from tip of grouser at ISO 88.13 1.25 m overhang	6910	272.0
N	Height of tail block attachment lug from tip of grouser	2845	112.0

Weights

Operating weight of standard machine [1]	21 727 kg (47,900 lb.)
Shipping weight of standard machine [2]	20 452 kg (45,090 lb.)
Weight of 6.1 m (20 ft.) boom	965 kg (2,127 lb.)
Weight of boom sheave blocks, the load blocks and pins	204 kg (450 lb.)

[1] Operating Weight: Includes lubricants, coolant, 100% fuel, hydraulic controls and fluids, backup alarm, seat belt, 600 mm (23.6 in) single grouser shoes, drawbar, counterweight, boom and pulley blocks and cable and operator.

[2] Shipping Weight: Includes lubricants, coolant, 10% fuel, hydraulic controls and fluids, backup alarm, seat belt, 600 mm (23.6 in) single grouser shoes, drawbar, counterweight, and pulley blocks and cables.

Winch Dimensions

	Hook	Boom
Drum diameter	270 mm (10.63 in.)	270 mm (10.63 in.)
Flange Diameter	419.1 mm (16.5 in.)	419.1 mm (16.5 in.)
Effective Drum Length	254 mm (10 in.)	349.2 mm (13.75 in.)
Capacity - 3/4" (19.05 mm) diameter	40.2 m (132 ft.)	78.3 m (257 ft.)

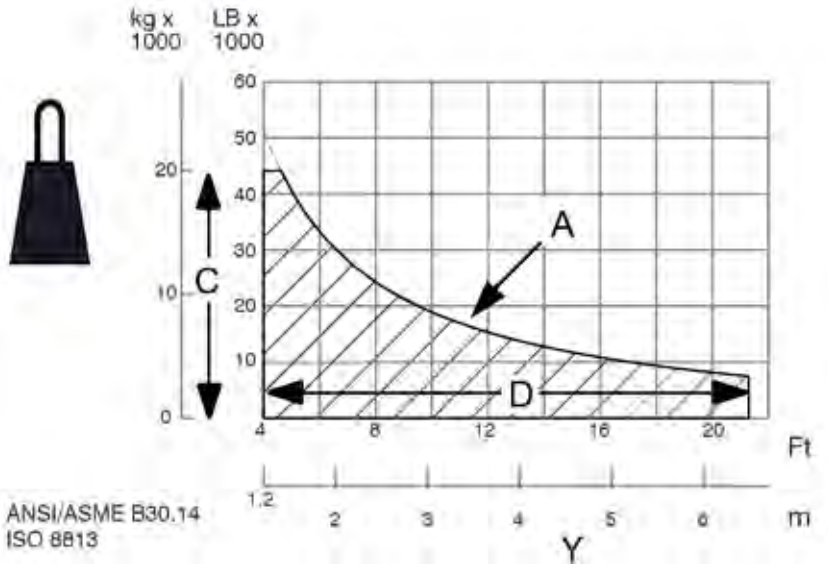
Winch Speeds

(Bare drum, nominal line speed, no load)	Hook	Boom
High Speed	67 m/min (220 ft/min)	36.9 m/min (121 ft/min)
Low Speed	26.5m/min (87 ft/min)	———

Lifiting Capacities

71H Pipelayer

Maximum lift capacity at tipping point (per ISO 8813)	27 215 kg (60,000 lb.)
Wire rope diameter	19.05 mm (0.75 in.)
Minimum breaking strength of wire rope	261.56 kN (58,800 lb.)
3 part load line	
3 part boom line	
Mass of the extended counterweight	3701 kg (8,158 lb.)
Standard boom length	6.1 m (20 ft.)
Operating weight of the standard machine	21 727 kg (47,900 lb.)



The following are as per ANSI/ ASME B30.14, ISO 8813: 1992:
(A) Load capacity
(Y) W12 Load overhang
(C) Rated tipping load lift capacity
(D) Working range

Intended Use
This machine is a Pipelayer that is described in ISO 6165:2012. The machine is intended to perform the following functions: lift, handle, and lay down pipe with a side mounted boom.

Restrictions to Application and Configuration
The maximum lift capacity is 27 215 kg (60,000 lb.). The maximum fore and aft slope is 45 degrees or a 100 per cent grade for the proper lubrication of the pipelayer components.

VANGUARD CPW 125-4 Series 2

An outstanding choice for Productivity and Versatility

Continuous Powered Welding Solution

The specifications of the 71H pipelayer makes it the preferred choice for utility type tasks on a pipeline job-site, like welding. PipeLine Machinery International is the exclusive distributor for a continuous powered welding solution that can be installed as an attachment on the 71H.

Weld Deck

Utilizing substantial research with industry leaders and technicians, Vanguard Equipment, Inc. developed the CPW 125-4 Series 2 welding package, known as the Weld Deck. This state-of-the-art unit has revolutionized the quality and efficiency of on-site pipeline welding. Unique features of this package include:

- The power generation is independent of the carrier allowing the unit to be moved without shutting down the power which results in a faster cycle time for welding a joint of pipe.
- A closely governed genset results in tighter frequency control creating higher quality welds and fewer weld repairs.
- The cycling time of line-up clamps is much quicker with this model welding package. The air compressor delivers the air at both a higher volume and pressure. The fact that there is no down time for the compressor while moving the unit adds to its ability to replenish the air much faster than other designs.
- A direct-coupled diesel engine provides zero mechanical loss to AC generator resulting in excellent fuel efficiency.
- Improved high-pressure air system offers continuous operation, delivering 50% more air over previous industry standard.

Please contact your account manager for more information on the CPW 125-4 52 Weld Deck, continuous powered welding solution.

PipeLine Machinery

Your Global Partner for Pipeline Solutions

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