Maren 'ProPAK 2R Series'

Two-Ram Automatic Horizontal Shear Balers

BALER DIFFERENTIATORS

Construction Differentiators

Chassis Construction

The chassis on all Maren two-ram balers are constructed by Interlocking steel plates. A36 steel plate is welded on both sides of each attaching plate, improving the strength of the weldments. The baler floor is notched, and the side walls are tabbed and when connected together, they create one, structurally-sound steel piece. This type of construction makes the baler more rigid thus extending its useful life. The thickness of the steel plates Maren uses to construct each baler are thicker than the majority of most competitors. The rigidity interlocking steel plate construction mixed with the thickness of each steel plate is correlated with the baler's weight. As you will see in the Data Performance section, Maren's baler weights are unmatched in the industry.

Main Ram Design

Maren's unique, interlocked ram design epitomizes the term "rigidity". The ram is shaped like the letter "L". It's situated in the ram where the short line that makes up the "L" is sitting vertically. This design also eliminates the buildup of any material behind the ram. During each return stroke, the ram acts as a broom and sweeps any material that may have migrated behind the main ram out of the material evacuation slot located just behind the ram's home position. The design of the rams of our competitors does not offer this convenient, time-saving feature. There will always be a time where material will need to be removed from behind the ram of a competitor's machines.

Cylinder Mount - 2R175 & 2R185 Models

Maren mounts the dual cylinders on the 2R175 & 2R185 models using a cross-tube design. This design is constructed by putting 2.5" pins through 2" thick clevis bars on both ends of each cylinder. The 2" thick, grade 50 steel clevis bars are then interlocked and braced between the 1/2" bale chamber side walls, floor and top. The entire clevis bar assembly is vertically reinforced and boxed with 3/8" 180,000psi plate. We are aware that our cross-tubed design is completely overkill, however there were balers with this mounting type in the past that weren't structurally stable. The high rate of cylinders detaching from the chassis of these balers and the design was the scapegoat when in reality it was just a combination of decreasing material costs and poor engineering. Since debuting our first baler model with this mounting design, Maren has never received a single report of a cylinder coming detached from the baler.

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Cylinder Mount - All Other Models

The cylinders on every dual & triple motor model are mounted using keylock design. This cylinder mount design is unique to Maren Pro-PAK balers (two-ram & open-end). This design ensures that the mounting bolts are never put in tension by the cylinders baling force. This nearly eliminates any possibility a mounting bolt connecting the cylinder and baler chassis from breaking. The design incorporates running the “tail" flange located on the end of the main cylinder through a "negative" shaped hole which has been cutout from the mounting plate attached to the chassis. The cylinder is rotated an 1/8 of turn and bolted in place.


Progressive Shear Blade

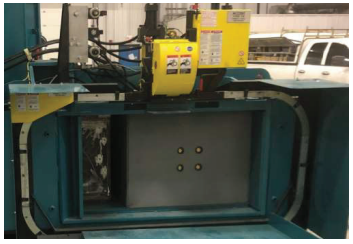
Constructed of hardened AR400 steel blade on the chassis and a hardened AR400 shear edge on the ram nose. The chassis blade is shimmable and rarely requires adjustment after factory shim. Each chassis shear blade is reversible & replaceable. The extended progressive cutting profile shears material over a long distance effectively reducing shear jams. The shear blade is very symmetrical which equally distributes the forces created during shearing to each sidewall reducing the possibility of bowing the sidewall. The “shear gap” or distance between the two shear blades is maintained by shimming the ram guide shoes.


Replaceable Liners

Replaceable NyOil (oil-impregnated) shoes on the main ram, replaceable abrasion resistance AR400 liners for each shoe on the chassis floor. The shoes glide across the liners on the floor. Abrasion resistant AR400 wear liners are stitch welded in position. After many years of use the baler can be brought back to "like new" specs by simply replacing the chassis liners and ram wear shoes with standard service parts available from Maren.

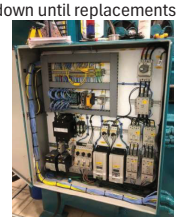

Wire-Tier

Maren equips all two-rams with the ACCENT 470 WIRE -TIER (unless requested otherwise). The Accent 470 is the industry-preferred wire-tier due to its impeccable track record in terms of quality and operating efficiency.



Electrical Enclosure

NEMA 4 Rated. The main service and branch circuits are protected with circuit breakers. No fuses are used in the enclosure except in non-USA 600-volt systems. Circuit breakers provide much easier trouble shooting and repair. Often even spare fuses can be used up in the trouble shooting process leaving the machine down until replacements can be obtained.



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Hydraulic Differentiators	
Hydraulic Pump(s)	Maren uses highly efficient limited HP pressure compensated piston pumps. These pumps operate up to 4,500 psi yet are capable of 6,100 psi. Maren maintains a huge safety factor by operating the pumps at just over 73% of their rated pressure.
NEMA Motors	Maren equips their horizontal balers with NEMA premium-efficiency motors. The motors on the 2R175 & 2R185 will be mounted on the rear of the baler, behind the feed hopper. The motors for all other models will be located on a remote power pack. The remote power pack can be positioned left or right of the main cylinder.
Remote Power Pack - Dual & Triple Motor/Pumps	All Maren two-ram balers with 40 or more horsepower will be supplied with a hydraulic system consisting of two/three motors and two/three pumps. The two-ram balers that fall into this category (most Maren two-ram models), will be mounted a remote power pack separate from the baler. Two pump systems will be supplied with two motors. Three pump systems will have three motors. We design our hydraulic in this way for a couple reasons. The first reason we do this is to help the end user keep their electrical costs & footprint low during the slower periods of their output cycle. Most end users aren't going to be operating at max capacity 100% of the time, so using all the available HP isn't necessary. Splitting the overall HP in half or thirds allows the end user to operate the baler on just one of the two or three motors their baler is equipped with. Running one out of two 20HP motors for 3 out of 12 months compared to running one 40HP motor the entire year is going to lower their electrical costs and carbon footprint. The other reason we designed our hydraulic system this way is to keep the system redundant. If one of the pumps/motors goes bad, there is always a backup available. Switching pump/motor B or C into pump A takes a little time and expertise, however if this situation were to arise, the end user can still keep the baler operational until the replacement arrives.
Hydraulic Operating Pressure	Running the limited HP pressure compensated pistons pumps at a higher pressure allows us to equip our two-ram balers with a smaller cylinder bore than most of Maren's competitors. This higher operating pressure allows our balers to maintain the same (if not higher) platen force and ram fae pressure. Running at a high pressure maximizes the efficiency of the motors available horsepower during operation.
No-Load Cycle Time	No-load cycle times only tell the story of how fast the baler will be if there is no material in the chamber (which is a pretty useless metric). Maren two-ram balers are going to have a higher no-load cycle time when compared to a comparable competitor model. The only reason our balers have a higher no-load cycle time is due to the fact the stroke lengths of our cylinders are considerably longer than the majority of our competitors (The reason we equip our balers with this extra stroke length will be explained later in this document). In most cases, our two-ram balers are actually going to be quicker under-load. The limited HP compensating piston pumps operate in a way where once the preset pressure is reached, the pumps will maximize the available HP throughout the remaining length of the stroke.
Hydraulic Pump Volume	As you will see in the performance data, Maren only provides (2) different pump sizes - 48gpm and 100gpm. Should a pump unfortunately stop operating, we would be able to ship the replacement out that day or the next at the latest.
Flooded-Suction Pumps	Maren pumps are flooded suction mounted below fluid level, but external from the tank. Pumps that are flooded suction ensures you never have a dry start-up, yet the external mounting allows simple and easy access for maintenance.
Feature Differentiators	
Bale Separation/Sizing Door	Bale Sizing Door allows ejection of up to a 13"oversized bale. Facilitates instant material changes and virtually eliminates cross contamination between bales. This feature is standard on all Maren two-ram balers; most competitors list it as a very expensive option due to the thickness of the steel needed to endure forces from the baled material and eject cylinder. The added cost for all the additional hydraulics components required are the other factor.
Remote Baler Controls	Pedestal-mounted controls allow it to be positioned wherever the customer requires it as long as the operator has a clear view of the eject door. NEMA 4 rated. Maren baler has touch screen electronic control panel to allow for storage and recall of saved programmed material settings, including bale size, wire count, wire placement, photo-eye selection, and current bale statistics.
Bale Width Adjustability	The width of the bale can be adjusted on the baler's HMI screen controls. This feature allows the user to achieve expanded bale widths between 38" and 50". Adjusting the width of a bale is extremely important for maximizing trailer and sea container loading of lighter materials like foam. The ability to make bales of varying width is very useful in times where the user doesn't have enough material to make a bale that meets mil-spec.
Main Ram Penetration	Ram penetrates baling chamber to within 8" of the endwall. This dramatically increases the bale weights at any given bale force by fully compacting each lamination. The main ram penetrates close enough to the endwall where materials can be fully compressed from the first to final stroke. The main ram extends 40" into the chamber a penetration ratio of 83%.
Stroke After Shear Length	S-A-S is the distance between the edge of the shear blade to the location where the ram is positioned on a complete bale. Too short of distance in this area causes the baler to shear and compress at the same time; decreases ability to do either job properly. A longer stroke after shear allows the baler to concentrate its pressure on shearing and then transferring that pressure on compaction. The potential for shear jams is worse at the end of every bale and these shear jams cause the operator to shut down the baler, enter the bale chamber and clear the jam. Adding extra length to the baler in this area both increases the baler cost because of the extra chassis length and increases the cost of the cylinder as a longer cylinder stroke is required.
Detection Systems - Low Oil, Over Temperature, Clogged Oil Filter	Oil level is monitored, and the baler main pump motor will be shut down in the event a low oil condition is detected. The feature prevents the baler from pumping the reservoir out onto the production floor in the event of a hose or component failure. Oil temperature is monitored, and the baler will automatically drop out of automatic operation and go into a cool down cycle if overheat is detected. Oil filter backpressure is monitored, and will alarm the operator if the filter becomes clogged.
Ram Dwell Time Adjustments	Both ram forward and ram home dwell times are user adjustable for each material recipe saved in the HMI SmartBale touch screen. The adjustable ram forward dwell time is very useful when "dewatering" materials or squeezing liquids from punctured cans, bottles or containers.
Shear Jam Prevention-Correction	If the machine detects a shear jam it will reverse the main ram multiple times before it alerts the operator. Ultimately if the jam cannot be cleared automatically the baler will drop out of automatic mode into manual mode and alerts the operator with an audible and visual signal. The number of times the main ram reverses can be adjusted in the material recipe creation.
Hopper Bridge Detection	Automatic detection and clearing of material bridged in transition hopper. Maren baler automatically detects if hopper bridging has occurred and attempts to clear the material before alerting operator.
Labeled Grease Points	Grease points are labeled, and a grease gun is provided, mounted to baler. All grease points are accessible from the outside of the baler without removing any safety covers or entering danger zones. Simple labeled grease points allow daily operators to do most of the preventative.

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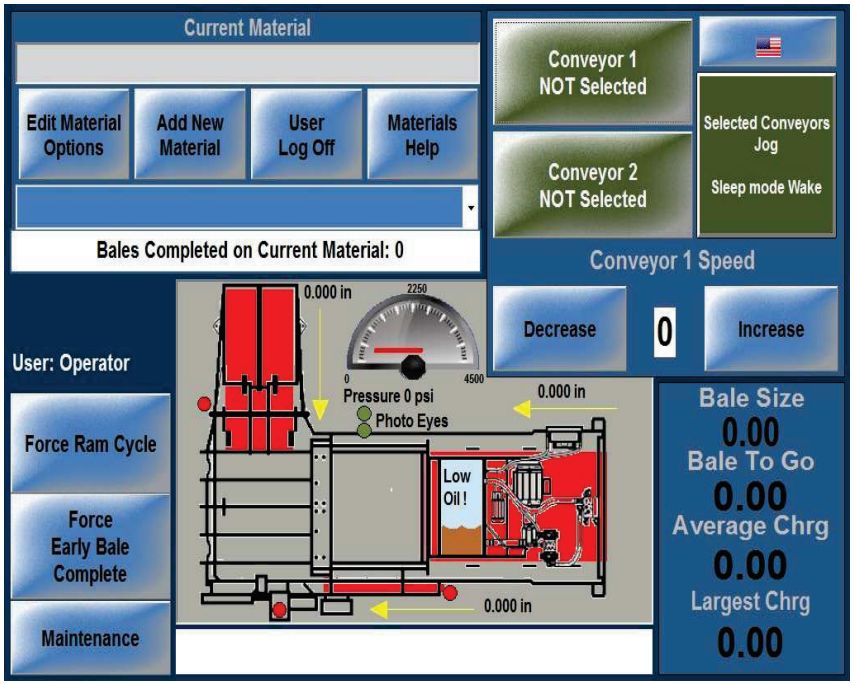
Technological Differentiators

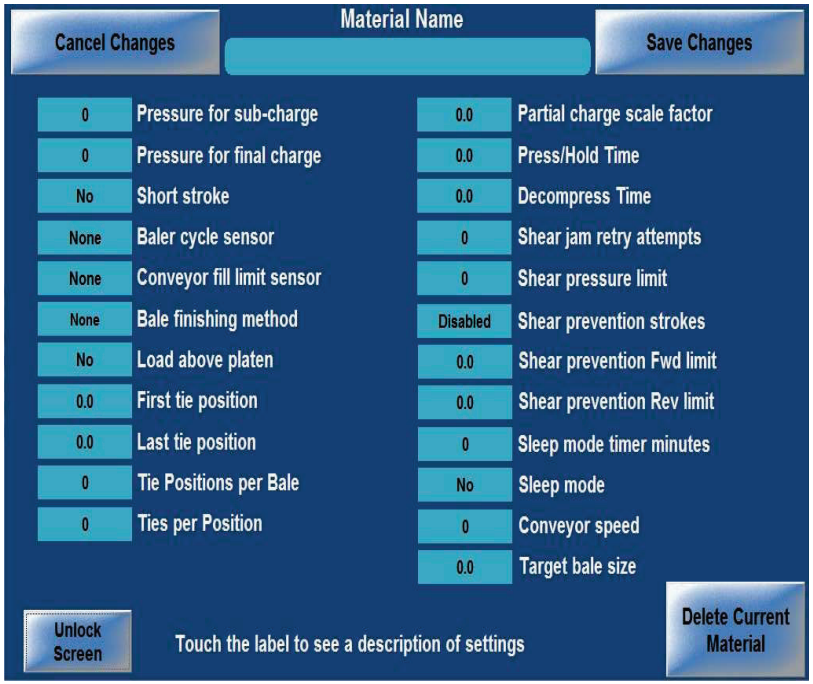
SmartBale Intelligent Baler Control Technology

Main/Home Screen Statistics	The main HMI screen monitors the following statistics: current hydraulic pressure, stroke length position, ram speed (in/sec)
Current/Completed Bale Statistics	The main HMI screen monitors the following statistics: current bale size, remaining length until bale is completed, average length per charge baled, largest charge baled during current bale
Create & Save "Material Bale Recipes"	Allows the operator to simply hit one drop down button on the home screen and select the material the user wishes to bale. When a material is selected, the baler automatically adjusts to the bale parameters that have been programmed/selected for that specific material.
SmartBale Mobile Remote Interface	Monitor and control the operation of your ProPAK two ram baler with a portable full color touch screen. Allows you to monitor bale size and statistics, read messages, clear jams and change materials safely from the seat of your loader.
Password Protection	Material Recipe Creation & Maintenance Screens

Main/Home Screen



Material Recipe Creation Screen



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Baler Data & Performance

Hydraulic System

	2R175	2R185	2R210	2R265	2R285	2R350	2R425	2R500
Motor HP Options	20HP 30HP	20HP 30HP	40HP (20HPx2)	40HP (20HPx2) 60HP (30HPx2)	80HP (40HPx2)	80HP (40HPx2) 100HP (50HPx2) 120HP (40HPx3)	150HP (50HPx3) 180HP (60HPx3) 225HP (75HPx3)	150HP (50HPx3) 180HP (60HPx3) 225HP (75HPx3)
Main Cylinder Bore & Rod Diameter	(2) 6" x 4.5"	(2) 5.5" x 4.5"	8" x 6"	9" x 7"	9" x 7"	10" x 8"	11" x 9"	12" x 10"
Main Cylinder Stroke Length	126"	96"	117"	117"	117"	136"	158"	158"
Main Ram Thrust *(lbs.)*	175,000	187,468	211,115	267,192	286,277	353,429	427,649	509,938
Ram Face Pressure *(psi)*	102	109	117	156	167	207	250	297
No-Load Cycle Time *(seconds)*	40	28	22	22	11	80HP/100HP = 15 120HP = 11	14.5	17
Estimated Under-Load Cycle Time (*seconds* **)**	20HP = 64.6 30HP = 52.5	20HP = 35.5 30HP = 30.2	40HP = 28.2	40HP = 33.4 60HP = 25.6	80HP = 17.6	80HP = 23.9 100HP = 21.1 120HP = 12.4	150HP = 24.7 180HP = 17.2 225HP = 15.6	
Total Pump Volume *(gallons)*	48	48	96	96	200	80HP = 200 100HP = 200 120HP = 300	300	300
Hydraulic System Pressure *(psi)*	3,000	4,200	4,200	4,200	4,500	4,500	4,500	4,500
Hydraulic Oil Reservoir Volume *(gallons)*	180 (Shipped Full)	150 (Shipped Full)	400	400	600	80HP/100HP = 600 120HP = 800	150HP = 800 180HP = 900 225HP = 900	150HP = 800 180HP = 900 225HP = 900

Baler Construction

	2R175	2R185	2R210	2R265	2R285	2R350	2R425	2R500
Hopper Opening *(L x W)*	78" x 54"	48" x 54"	64" x 60"	64" x 60"	64" x 60"	80" x 60"	100" x 60"	100" x 60"
Baler Length *(in.)*	404	216	333	333	333	371	411	411
Baler Width *(in.)*	243	243	266	266	266	266	266	266
Baler Height *(in.)*	84.25	84.25	85.5	85.5	85.5	85.5	85.5	85.5
Sidewall Thickness *(in.)*	0.50	0.50	0.75	1.00	1.00	1.00	1.25	1.25
Endwall Thickness *(in.)*	0.75	0.75	1.50	1.50	1.50	1.50	2.00	2.00
Ram Penetration to Endwall	8"	8"	8"	8"	8"	8"	8"	8"
Length of Stroke After Shear	5"	5"	10"	10"	10"	12"	15"	15"
Baler Weights *(Approx,)*	20HP = 33,850# 30HP = 33,900#	20HP = 29,625# 30HP = 29,675#	40HP = 70,950#	40HP = 72,950# 60HP = 73,850#	80HP = 76,350#	80HP = 92,750# 100HP = 93,750# 120HP = 97,750#	150HP =108,350# 180HP = 108,850# 225HP =109,350#	150HP =111,350# 180HP = 111,850# 225HP =112,350#

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Baler Data & Performance

Estimated Material Bale Weights *- Assuming 30"W x 60"L x 48"W Bale (Density = 50cf)*

Material	2R175	2R185	2R210	2R265	2R285	2R350	2R425	2R500
Open-Top OCC Boxes	1,500#	1,500#	1,500#	1,600#	1,600#	1,700#	1,700#	
Comingled OCC	1,500#	1,500#	1,500#	1,600#	1,600#	1,700#	1,700#	
HDPE Containers		1,125#	1,200#	1,300#	1,300#	1,500#	1,500#	
PET Bottles		1,000#	1,100#	1,200#	1,200#	1,300#	1,300#	
Steel/Tin Cans		1,250#	2,000#	2,100#	2,100#	2,200#	2,200#	
Aluminum Cans (UBC)		700#	850#	1,000#	1,000#	1,100#	1,100#	
Magazines			1,800#	1,900#	1,900#	2,000#	2,000#	
Mixed Paper			1,600#	1,700#	1,700#	1,700#	1,700#	
Aluminum Extrusions			1,200#	1,300#	1,300#	1,400#	1,400#	
Aluminum Siding/Sheeting			1,800#	1,900#	1,900#	2,000#	2,000#	
Insulated Copper Wire			5,800#	5,900#	5,900#	6,000#	6,000#	
Municipal Solid Waste			2,200#	2,300#	2,300#	2,400#	2,400#	