

Preliminary

February 2002

Product Bulletin



THE ALL-NEW

Challenger[®]
MT800 SERIES

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Challenger®
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Introducing the Challenger® MT800 Series tractors – an all-new line that stretches the limits on productivity and performance in the high-horsepower tractor category with the first modern-age 500-horsepower tractor, the MT865.

As with the Challenger MT700 Series tractors launched in Fall 2001, the Challenger MT800 Series are designed to optimize tractor performance, bringing to bear nearly two decades of design leadership in rubber-belted track technology.

This line expands the horsepower ranges set by earlier Challenger tractor models. All MT800 tractors feature new-design Cat® engines for power and performance:

- MT835 – 340 gross horsepower – Cat® C12 engine
- MT845 – 380 gross horsepower – Cat® C12 engine
- MT855 – 450 gross horsepower – Cat® C15 engine
- MT865 – 500 gross horsepower – Cat® C16 engine

The Challenger MT800 tractors offer versatility not seen before in this category, allowing these tractors to be both row-crop capable while still able to do heavy tillage:

- First high-horsepower track tractor to feature adjustable gauge (90" to 128")
- Good under-chassis clearance for row-crop applications
- Widest choice of belts available:
 - 18" extreme application (designed specifically for row-crop applications)
 - 27.5" general ag and extreme application
 - 30" general ag and extreme application
 - 36" general ag and extreme application
- Belts feature centered guide blocks for better performance, alignment
- A choice of medium and wide undercarriage driver, idler and midwheels allow optimizing 18" to 36" belt performance and wear
- The undercarriage's inline reaction arm allows for fast, easy gauge changes without having to detension the belt
- For added flexibility, chemical tank mounts are integrated on the undercarriage; tractors are also front-blade capable for pushing snow or moving light dirt in ag applications

These tractors replace the paradigm-busting Challenger® E-Series tractors and represent the sixth-generation of Challenger tractors that began with the Model 65 introduced in 1986. Since then, more than 10,000 Challenger tractors have been put into service across the globe, establishing track tractors' presence and growing predominance in the big-tractor category. It's a trend solidified by the very real advantages of tracks: improved traction, flotation and power to the ground, with reduced compaction.

All-New Cab (pages 6-39)

- Unprecedented space and all-around visibility, including a high operator location for maximum visibility; standard instructional seat
- Patented steering wheel, ergonomically designed for tracks with optional auxiliary radio controls
- Exclusive Tractor Management Center (TMC)
 - Integrated display with transreflective LCD technology
 - Fingertip hydraulic controls
 - Integrated armrest
 - Power Management System
 - One-Touch™ management system
- Optional integrated Auto-Guide™ satellite guidance system
- Surround-Flow™ ventilation system
- Unprecedented Nightbreaker™ HID lighting package, with two forward and two rear high intensity discharge lights
- Exclusive full-coverage, parallel sweep front wiper blade
- Power-Pack™ accessory power outlets
- Full-access walkaround platform for convenient fueling, cleaning
- Dozens of other new and improved features!

All-New Mobil-trac™ Undercarriage (pages 40-52)

- Exclusive Opti-Ride™ suspension features cushioned undercarriage and suspended hardbar, resulting in superior ride on the road and in the field
- New midwheel suspension combines best features of hard-bottom suspension with benefits of bogie suspension
- Longest wheelbase in the industry (as measured from drivewheel to idler) offers maximum balance, flotation and tractive efficiency
- Patented in-line reaction arm allows for fast gauge changes without detensioning the belt
- Choice of idlers, midwheels and drivers in two widths for better matchup with belts and improved belt life
- Choice of four belt widths in two belt types match tillage, scraper or row-crop applications

All-New Cat® Powertrain, Engine (pages 53-65)

- Improved C12, C15 and C16 engines feature:
 - Large engine displacement
 - 8% power growth
 - Proven wet-liner design
 - Class-leading 500-gross-horsepower MT865 features impressive 964-cubic-inch C16 engine
- Optional factory-installed air compressor
- Delayed engine shutdown timer
- Cat-built standard 16x4 full powershift transmission utilizes electrohydraulic controls
- Updated electronic-over-hydraulic differential steering system
- Optional electronically modulated 1000 rpm PTO
- Highest transport speed of any high-horsepower track tractor at 24.6 mph
- Engine and powertrain integrated via Intellitronics™ electronic system for peak performance and longevity

All-New Hydraulics *(pages 66-70)*

- Up to six hydraulic valves available, with up to five fingertip-hydraulic levers in line
- Exclusive Load-Independent Flow Division (LIFD) ensures proportional reduction in flow when demand exceeds pump capacity; guarantees flow when implement needs it the most
- Standard 43.5 gpm hydraulic pump – optional 59 gpm hydraulic pump – ensures quick hydraulic response
- Full hydraulic brake control improves brake performance, reduces operator effort

All-New Drawbar, Hitch Designs *(pages 71-74)*

- Standard wide-swinging roller drawbar features rubber bumpers and wear plates; features 32 degrees swing either direction
- Exclusive wide-swinging powered drawbar (optional) allows for offsetting drawbar loads and dampening/acting like a shock absorber on end-row turns when drawbar is unpinned for exceptional performance
- Optional 19,500 lb steerable 3-pt. hitch includes a standard drawbar with a maximum of 28 degrees of swing in either direction
- Drawbars feature auto-trigger pin for fast, easy implement hookups

Updated Appearance, Structure *(pages 75-80)*

- Impressive 305 gal fuel capacity
- Automotive-type paint technology includes clear-coat paint on non-metallic yellow surfaces (clear-coat blocks UV light from prematurely fading paint); double e-coat on black, gray components designed in for enhanced durability, corrosion resistance
- 18-gauge (and larger) wiring throughout gives good wear, servicing characteristics
- Full tilt-up access hood for excellent access
- Specific undercarriage weights minimize debris build-up and streamline the overall design (vs. using front weights)
- Wide choice of ballasting, counterweight options
- Two toolbox locations for excellent storage capabilities

Wide Choice of Attachments *(pages 81-82)*

- Extend the versatility of your Challenger® tractor

Serviceability *(pages 83-85)*

- Easy access to daily service points



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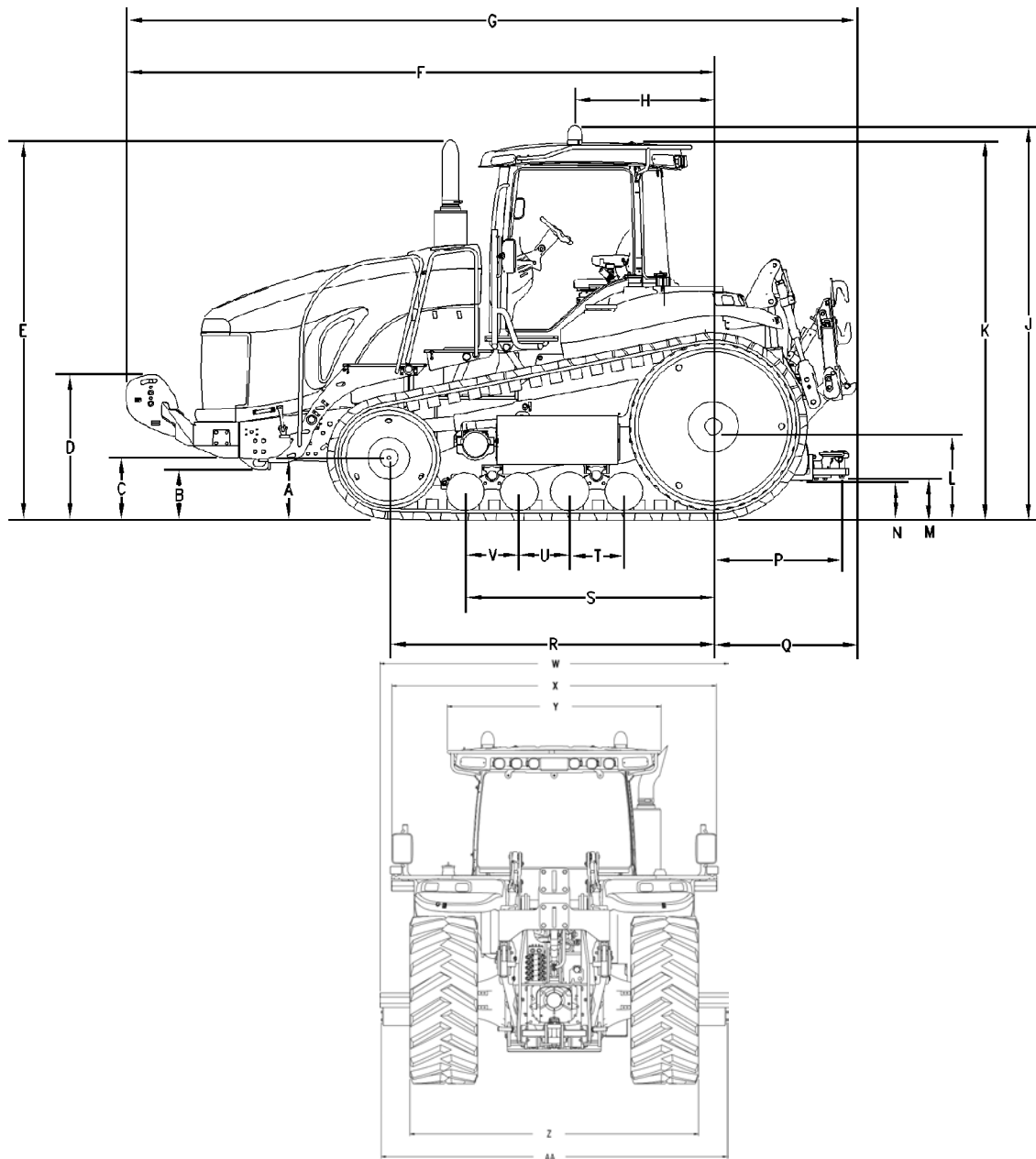
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1. Basic Specifications

	MT835	MT845	MT855	MT865
Gross Engine Power @ Rated Engine Speed	340 HP (254 kW)	380 HP (283 kW)	450 HP (336 kW)	500 HP (433 kW)
Gross Engine Power @ Max Power Growth¹	367 HP (274 kW)	410 HP (306 kW)	486 HP (362 kW)	540 HP (403 kW)
Engine	C12	C12	C15	C16
Displacement	732 in ³ (12 L)	732 in ³ (12 L)	893 in ³ (14.6 L)	964 in ³ (15.8 L)
Bore	5.1 in (130 mm)	5.1 in (130 mm)	5.4 in (137 mm)	5.5 in (140 mm)
Stroke	5.9 in (150 mm)	5.9 in (150 mm)	6.5 in (165 mm)	6.75 in (171 mm)
Rated Speed	2100 rpm	2100 rpm	2100 rpm	2100 rpm
Transmission	16 Forward 4 Reverse Powershift Direct Drive	16 Forward 4 Reverse Powershift Direct Drive	16 Forward 4 Reverse Powershift Direct Drive	16 Forward 4 Reverse Powershift Direct Drive
Steering	Speed Compensated Electrohydraulic Differential Steer	Speed Compensated Electrohydraulic Differential Steer	Speed Compensated Electrohydraulic Differential Steer	Speed Compensated Electrohydraulic Differential Steer
Implement Hydraulics	Electrohydraulic Closed Center Load Sensing	Electrohydraulic Closed Center Load Sensing	Electrohydraulic Closed Center Load Sensing	Electrohydraulic Closed Center Load Sensing
-Flow (Standard)	43.5 U.S. gpm (166 lpm)	43.5 U.S. gpm (166 lpm)	43.5 U.S. gpm (166 lpm)	43.5 U.S. gpm (166 lpm)
-Flow (Optional)	59 U.S. gpm (223 lpm)	59 U.S. gpm (223 lpm)	59 U.S. gpm (223 lpm)	59 U.S. gpm (223 lpm)
-Relief Pressure	2900 psi (20325 kpa)	2900 psi (20325 kpa)	2900 psi (20325 kpa)	2900 psi (20325 kpa)
Hydraulic Capacity - Total	70 U.S. gal (265 L)	70 U.S. gal (265 L)	70 U.S. gal (265 L)	70 U.S. gal (265 L)
Electrical System	12 V/ 160 Amp	12 V/ 160 Amp	12 V/ 160 Amp	12 V/ 160 Amp
Belt Options	18", 27.5", 30", 36" (457, 699, 762, 914 mm)	18", 27.5", 30", 36" (457, 699, 762, 914 mm)	18", 27.5", 30", 36" (457, 699, 762, 914 mm)	18", 27.5", 30", 36" (457, 699, 762, 914 mm)
Track Gauge	90 –128" (2286 – 3251 mm)	90 –128" (2286 – 3251 mm)	90 –128" (2286 – 3251 mm)	90 –128" (2286 – 3251 mm)
Power Take-off (Optional)	1000 rpm	1000 rpm	1000 rpm	1000 rpm
Three-Point Hitch (Optional)	Cat. III/IVN & IV	Cat. III/IVN & IV	Cat. III/IVN & IV	Cat. III/IVN & IV
Fuel Capacity	305 U.S. gal (1155. L)	305 U.S. gal (1155. L)	305 U.S. gal (1155. L)	330 U.S. gal (1249. L)
- Max Fuel Capacity (with modular fuel tank)	330 U.S. gal (1249. L)	330 U.S. gal (1249. L)	330 U.S. gal (1249. L)	330 U.S. gal (1249. L)

¹ Power delivered under heavy drawbar loads with engine lugged back to 1800 RPM.

2. General Dimensions



(A) 23.7 inch (602 mm)
 (B) 18.7 inch (474 mm)
 (C) 22.5 inch (572 mm)
 (D) 53.2 inch (1351 mm)
 (E) 138.7 inch (3523 mm)
 (F) 213.8 inch (5430 mm)
 (G) 265.9 inch (6754 mm)
 (H) 50.4 inch (1280 mm)
 (J) 144.0 inch (3657 mm)

(K) 138.1 inch (3509 mm)
 (L) 31.3 inch (795 mm)
 (M) 15.4 inch (391 mm)
 (N) 14.4 inch (366 mm)
 (P) 47.0 inch (1193 mm)
 (Q) 52.1 inch (1324 mm)
 (R) 118.1 inch (3000 mm)
 (S) 90.4 inch (2295 mm)
 (T) 19.7 inch (500 mm)

(U) 18.3 inch (465 mm)
 (V) 19.7 inch (500 mm)
 (W) 142.1 inch (3609 mm)
 (X) 132.2 inch (3357 mm)
 (Y) 87.0 inch (2210 mm)
 (Z) 117.5 inch (2985 mm)
 (AA) 140.9 inch (3579 mm)

3. Operator Environment

The Challenger MT800 Series Tractor cabs feature the latest technology in operator ergonomics. The spacious cab provides excellent visibility and interior room. Challenger MT800 Series tractors are among the quietest in the industry while maintaining the highest sound quality for the operator. The Tractor Management Center (TMC) incorporates an innovative display for showing useful tractor/implement information along with the hydraulic, optional 3-pt. hitch, optional PTO, and transmission controls. State-of-the-art ergonomics provide the operator with easy access, maximum comfort, and unsurpassed operating convenience.

Key features of the operator's environment:

- Tractor Management Center (TMC) monitors and controls tractor functions
- Excellent visibility to front, rear, and sides
- Instructional seat
- Surround Flow™ ventilation system
- Quiet cab
- Full coverage parallel sweep front wiper
- Ergonomically designed controls and displays
- Backlit switches for improved nighttime operation
- Interior and exterior courtesy lights
- Power-Pack™ accessory power outlets for growing electrical requirements

3.1. Standard Cab

*Challenger
MT800 Series
Cab (shown
with optional
attachments)*



Figure 1

The Challenger MT800 Series standard cab is equipped with significantly more features than previous models. The spacious cab boasts 108 ft³ (3.06 m³) cab volume surrounded by 67.5 ft² (6.2 m²) of glass for excellent visibility to the front, rear and sides of the tractor. A full coverage parallel sweep front wiper keeps the front window clean.

Each cab comes equipped with an air suspension seat that swivels 25 degrees to the right for a superior view of the implement and 10 degrees to the left for easy cab entry and exit. The manually controlled standard heating and air conditioning system supplies warmed or cooled air to the Surround Flow™ ventilation system, which can deliver up to 400 cfm (11.3 m³/min) of air through vents strategically located throughout the cab. Tinted glass not only blocks the sun's glare for improved visibility, but helps keep the cab cool.

Most tractor functions are controlled by the Tractor Management Center (TMC), which has been ergonomically integrated into the operator seat armrest as a virtual extension of the operator's arm. Upfront analog gauges in the dash panel provide easy access to tractor operating information. Steering is controlled by a specially designed and patented steering wheel with an integrated hand rest designed for optimum steering comfort without hindering visibility to the dash panel. The steering wheel telescopes in and out and tilts fore and aft. A front warning horn button is built into the steering wheel. An instructional seat with seatbelt is located on the left side of the operator's seat. An attractive, washable floor mat not only enhances the appearance of the cab, but also helps reduce powertrain sound levels.

The standard cab comes fully equipped for nighttime operation so the workday doesn't have to end when the sun goes down. Eight forward facing halogen lamps will light up the tractor's path. Six of the forward facing lights are built into the hood: two roading lights, two high beam lights, and two side work lights. Two adjustable mid-mounted forward-facing lights help illuminate the tractor's path. Implement visibility is no problem with four rear-facing work lights. Two of the rear-facing lights are mounted below the cab roof, while the remaining two are built into the fender. Backlit rocker switches and an interior courtesy lights make night operation easy.

The standard cab provides plenty of storage space. Included are a cell phone holder, coat hook, three beverage holders, literature storage area, and a storage compartment that is temperature-controlled by the tractor's ventilation system. An additional storage compartment is located below the instructional seat. An ashtray and cigar lighter are also included.

Installation of auxiliary equipment (implement monitors, radios, etc) is easy with the 10 mounting bosses provided. Power is provided by two auxiliary electrical circuits (one 3-pin ag plug and one 12-volt power outlet). A second DIN radio slot is built into the headliner for installing a communications radio or GPS receiver. A sealed cable access hole routes cables in and out of the cab to the implement. The standard cab comes equipped with four 15-Watt speakers.

3.2. Deluxe Cab

When a customer upgrades to the deluxe cab, they receive an excellent value which includes: front sunvisor; the deluxe front wiper package with washer and intermittent speeds; a rear wiper with washer; automatic climate control; delayed lighting shutdown; delayed engine shutdown; battery disconnect switch; electric adjustable/heated external mirrors; and pre-wiring for a FM two-way radio. Also included in the deluxe cab are the Power-Pack™ accessory power outlets, which provides a 20-Amp fused terminal strip with four ignition powered circuits, and two fused ignition-switched battery power 12-volt ag power plugs.

3.3. Operator Controls

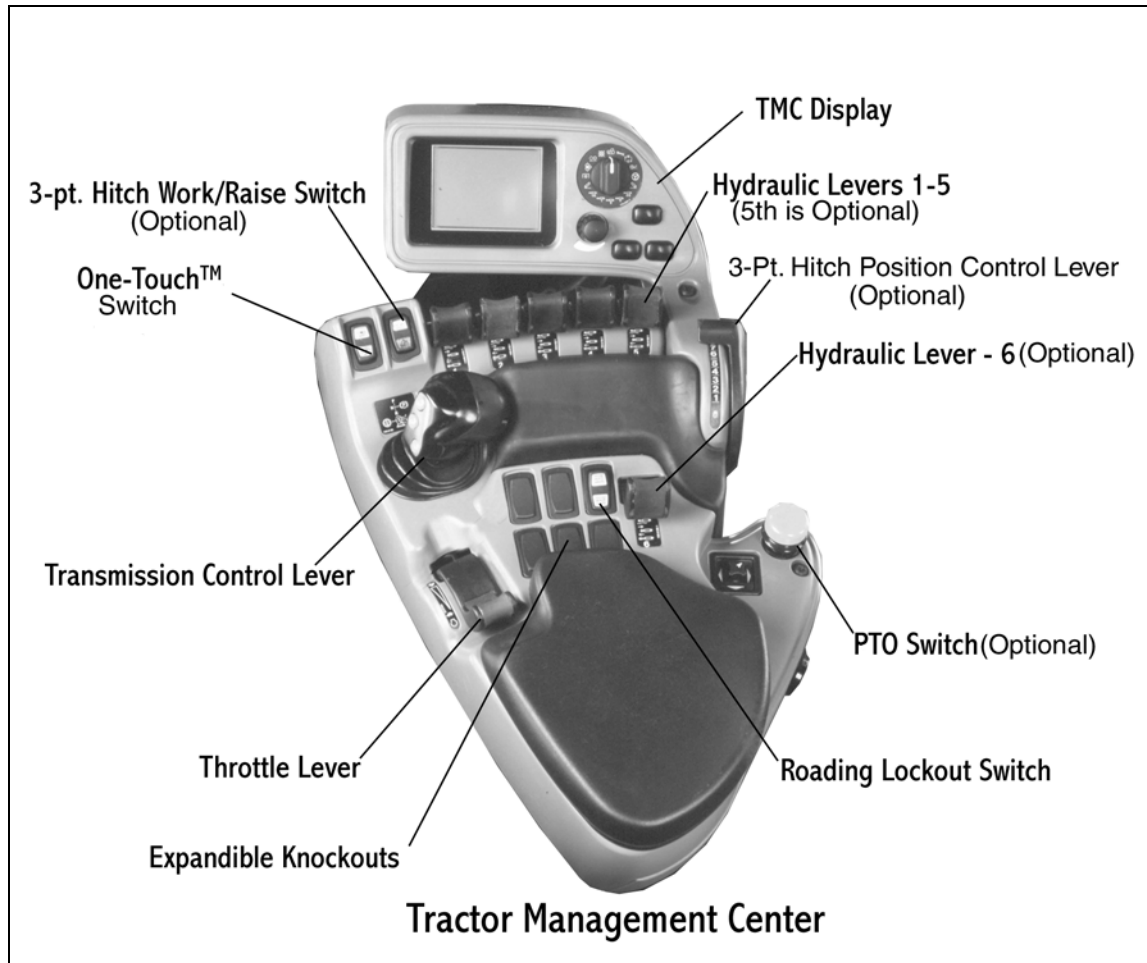


Figure 2

The **transmission control lever**, located on the left side of the TMC, controls the direction and speed of the tractor. The transmission control lever can be moved into the FORWARD, NEUTRAL, REVERSE, or PARK positions. The top two buttons on the left side of the lever are used to upshift or downshift the transmission. The bottom button on the lever engages or disengages the Power Management System.

The transmission control lever actuates the parking brake electronically. The PARK position of the lever should be used when the tractor is parked. To activate the park brake, move the lever out of the FORWARD or REVERSE position into the NEUTRAL position, and move the lever to the right. The letter "P" will appear in the "Gear" portion of the display. Steering is disabled when the transmission control lever is in the PARK position. If the tractor is shut off while in gear or in NEUTRAL, the parking brake will automatically apply after the tractor comes to a complete stop. You must cycle the transmission control lever through PARK in order to release the parking brake.

The red **throttle lever** is located to the rear of the transmission lever within easy and convenient reach. The standard **decelerator pedal** is a foot pedal that lowers the engine speed to an operator-set limit. The decelerator defaults to 1200 rpm when fully depressed. Using the TMC display, the operator can change the lower limit setting to anywhere within the valid speed range of 1000 to 2300 rpm. When the pedal is released, the engine returns to the current hand throttle setting.

The **electrohydraulic hydraulic control levers** electronically control the hydraulic flow to implements attached to the tractor. The TMC is designed to have up to five implement control levers in a row. An additional lever installed just behind the handrest controls the dealer-installed sixth implement control valve. Using electronic levers

eliminates the mechanical cable assemblies that were required to control hydraulic valves on previous models and enables more accurate control of hydraulic flow to implements. It also provides a means to make implement control programmable, enables timed start/stop functions and adjustable on-the-go hydraulic flow rates through TMC. The handrest provides a comfortable place for the operator's hand while activating the implement control levers.

With a flip of the **roading lockout switch**, located behind the handrest, the operator deactivates all implement hydraulic levers, the decelerator pedal, 3-pt. hitch, the One-Touch™ system, and the Auto-Guide™ satellite navigation system. This prevents inadvertent control actuation during transport. Hydraulic circuits that are already activated at the time the roading lockout switch is engaged can be disengaged while the roading lockout switch is still engaged by moving the appropriate control lever. However, no new circuits can be activated. The decelerator pedal is deactivated when this switch is activated to prevent engagement while roading.

The optional **3-pt. hitch control lever**, located on the right side of the handrest, controls the optional rear 3-pt. hitch. The ergonomically designed lever controls the movement and positioning of the vertical height of the 3-pt. hitch. The lever is designed with a fine adjustment for precision positioning of the 3-pt. hitch. The yellow button on the side of the lever is used for a quick override of the set height.

The optional **3-pt. hitch work/raise switch** that is located on the left side of the implement hydraulic levers can also control the hitch. The work/raise switch allows the operator to quickly raise the hitch to a predetermined maximum height, and quickly lower the hitch back to the position indicated by the 3-pt. hitch control lever. Pressing the top of the switch to the momentary position allows the hitch to “dive”. The dive feature is used in applications that require the operator to quickly lower the 3-pt. hitch and for situations where additional lowering is necessary to pull the tool into the ground. When the switch is held in the DIVE position, the 3-pt. hitch will lower at a faster rate of speed and to the lowest position possible, as allowed by the implement. The DIVE position temporarily overrides the WORK position. Releasing the switch from the momentary position will return the hitch to the WORK position. The operator can also raise and lower the 3-pt. hitch by using the fender-mounted **external raise/lower switch**. The switch allows slow hitch movements for ease in implement attachment and unhooking.

At the right-hand rear corner of the TMC is the optional **PTO switch**. Pulling the knob and collar upward engages the optional PTO. Pushing the knob downward disengages the PTO.

The optional **delayed engine shutdown** allows the engine to idle for a set time without the key in the ignition. This allows the turbocharger to cool down and the tractor to shut off without the operator sitting in the cab. The amount of time that the engine will run before shutting down can be changed to anywhere from 1 to 20 minutes in one-minute increments. The default setting is three minutes. The delayed engine shutdown is enabled with a rocker switch in the headliner. The switch is included in deluxe cabs.



Manual Park Brake Control

Figure 3

The **manual park brake control**, located between the operator's seat and the instructional seat, is used to engage the park brake in the event of an electrical failure of the park brake solenoid. Pull up this handle to engage the park brake.

Single spoke steering wheel specifically designed for track tractors.



Figure 4

The round “ball” built into the single-spoke **steering wheel** is specially textured and molded to add comfort and convenience during operation and act like the old-time “spinner ball” when steering. The steering wheel telescopes in and out and adjusts fore and aft for maximum operator comfort. The single spoke provides a comfortable resting location for the operator’s hand. The **horn** is in the center of the steering wheel. The flat areas on each side of the single spoke provide a convenient place to “bump steer” the tractor. “Bump steering” is a steering technique that allows tracked tractors to turn smoothly under heavy load with minimum soil disturbance. To make a turn, briefly turn the wheel and return to the centered position. Repeat the process as many times as needed, about one “bump” per second, and the tractor will gently complete any turn even under the most difficult traction conditions.

The steering wheel controls the electrohydraulic steering system. The steering system electronically controls the steering of the tractor through a track speed differential. This enables the operator to control the steering with less effort, provides a means to integrate auto-guidance into the main steering system, and allows easier system diagnostics and smoother steering. Through software modulation based on ground speed and operator input, the steering system provides the predictable consistency of a conventional wheel tractor steering system at road speeds and the spot turn capability of a track tractor at slow speeds for optimal maneuverability.

Foot Pedals

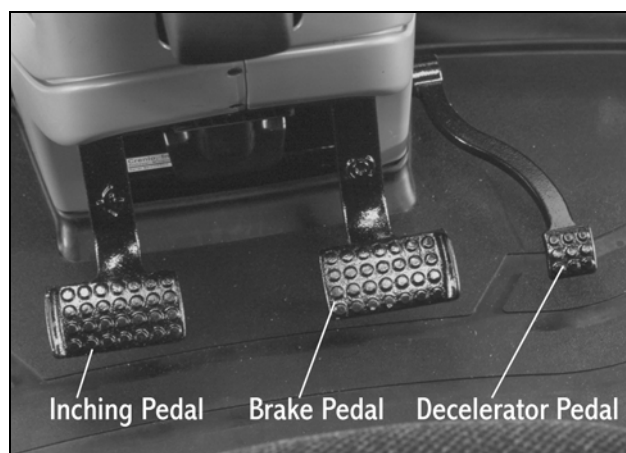


Figure 5

The inching pedal and service brake pedal are located below the front console. The **service brake pedal** applies equal force to both rear brakes. The **inching pedal** is provided for maneuvering while hooking up implements.

3.3.1. One-Touch™ Management System

One-Touch allows the operator to record a series of events and then repeat the series on command. One-Touch control can sequence events such as transmission shifting, throttle, 3-pt. hitch position, PTO status, implement raise and lower functions, and auto-guidance.



*One-Touch
Management
System Switch*

Figure 6

The One-Touch switch is a three-position rocker switch located in front of the transmission control lever. Pushing the top of the rocker switch can be used to perform the sequence at the beginning of a row. Pushing the bottom of the rocker switch can be used to perform the sequence at the end of a row.

The One-Touch system records machine functions while the operator is actuating them. The functions are then saved as a sequence. This sequence can then be executed later by pressing a single switch. Two different sequences can be recorded and are referred to as the RAISE sequence and the WORK sequence.

Example: An operator may wish to downshift the transmission by two gears, raise the rear 3-pt. hitch, and reduce the engine speed before turning around at the end of a field row. Instead of performing each of these functions individually at the end of every row, the operator executes them manually one time, and then saves them in memory as the RAISE sequence. The sequence can then be initiated at the end of subsequent rows by simply pressing a single switch. Similarly, the WORK sequence can be recorded once at the beginning of a row and initiated at the beginning of subsequent rows.

One-touch has two mutually exclusive modes of operation: SHIFT mode and ONE-TOUCH mode. One-Touch defaults to the SHIFT mode when the tractor powers-up. One-Touch will remain in SHIFT mode until a sequence is recorded.

When in **SHIFT Mode**, pressing the bottom of the One-Touch switch and releasing within three seconds causes the transmission to downshift by an operator-selected number of gears. Pressing the top of the One-Touch switch and releasing within three seconds causes the transmission to upshift by an operator-selected number of gears. The default setting will shift the transmission by three gears. One-Touch defaults to this mode on tractor power-up.

While in **ONE-TOUCH Mode**, pressing the bottom of the One-Touch switch and releasing within three seconds causes the first recorded function of the RAISE sequence to be executed. The remaining functions in that sequence will then be executed in the same order that they were recorded, including time delays between functions. This action can be used at the end of a field row prior to turning the tractor around.

Pressing the top of the One-Touch switch and releasing within three seconds, while the system is in ONE-TOUCH mode, causes the WORK sequence to be executed. This action can be used at the beginning of a field row after a turn has been completed.

To begin recording a RAISE sequence, press the bottom of the One-Touch rocker switch for at least three seconds while the system is in SHIFT or ONE-TOUCH mode. To begin recording a WORK sequence, press the top of the One-Touch rocker switch for at least three seconds, while the system is in SHIFT or ONE-TOUCH mode. An audible beep and illuminated indicator on the dash will indicate that a sequence is being recorded.

While sequence recording is active, any of the following functions initiated by the operator, and the time delays between them, will be recorded in the order in which they were performed:

- Pulse shifting the transmission up or down, excluding shifts to NEUTRAL, REVERSE, or PARK
- Changing engine speed by using the throttle or decelerator pedal
- Extend or retract any of the electrohydraulic implements at current flow rate and detent time
- Raise or lower the rear 3-pt. hitch with the raise/work switch
- Disengage or engage the rear PTO
- Disengage Auto-Guide™ system

Recording is terminated by momentarily pressing the top or bottom of the One-Touch switch. An audible beep from the display and the deactivation of the indicator light on the dash indicate that recording has stopped. Turning off the start switch key turns off One-Touch. Any recorded sequences must be recorded again after restarting the tractor.

3.3.2. Auto-Guide™ Satellite Navigation System

The Auto-Guide™ system steers the tractor without operator input when making parallel swaths, improving efficiency and reducing operator fatigue. Auto-Guide integrates parallel swathing into the electronics guiding the tractor along the parallel swath without operator assistance. The DGPS system features sub-meter accuracy. The Auto-Guide system includes software and requires the ISO11783 tractor/implement electronic communication data management.

Other Auto-Guide features:

- Straight path tracking
- Interface from guidance system to the One-Touch function
- Status indicators on dash panel
- Operator rocker switch engagement
- Auto-disengage when operator manually changes certain inputs beyond defined limits
- Operates from the TMC screens
- Light bar incorporated into TMC.
- Reduced operator fatigue by eliminating the need for continuous steering corrections
- Increases accuracy of spacing, minimizing overlap and under lap
- Allows for faster ground speed
- Easier, more accurate operation at night or in periods of low visibility
- Increased productivity
- Frees operator for management of other implement functions
- Utilizes controllers incorporated into tractor's system integration

3.3.3. Tractor/Implement Communication Bus

The tractor/implement communication bus is an electronic network that allows controllers on implements to communicate with controllers on tractors. Designed by a consortium of major manufacturers, universities, and standards organizations, it offers potential for machines from all manufacturers to “plug and play” together.

ISO11783 is a standard that defines the electronic communication bus and common language between tractors and implements. Other precision ag equipment suppliers are currently developing systems for planters, sprayers, spreaders and tillage equipment. One virtual terminal is to be used with all implements. The ISO11783 communication bus is optional on all Challenger MT800 tractors.

3.3.4. Product Link System

The Challenger MT800 Series tractors can be equipped with the Product Link 201 system. Product Link 201 is a wireless means of obtaining machine location, service hour meter readings, and remote diagnostic information. Information sent is delivered through the Caterpillar dealer information system, and can be accessed on the World Wide Web through the Dealer Storefront. Unlike competitive systems that communicate over cellular networks, Product Link 201 is a satellite-based system. Using satellites ensures coverage in areas that may not have adequate cellular service.

When Product Link is installed on a tractor that will be stored for an extended period, the batteries should be disconnected, or if the tractor is equipped with a deluxe cab, the disconnect switch should be turned off to prevent battery drain.

3.4. Monitoring Systems

The Challenger MT800 Series tractors use a sophisticated computer network to control the tractor. All controllers on the tractor are connected by high-speed data links - SAE standard J1939 and the proprietary Cat Data Link. With their built-in diagnostic capabilities, the MT800 Series tractors constantly monitor key tractor systems and warn the operator of system abnormalities, thus increasing machine uptime and decreasing repair costs.

3.4.1. Tractor Management Center (TMC) Display

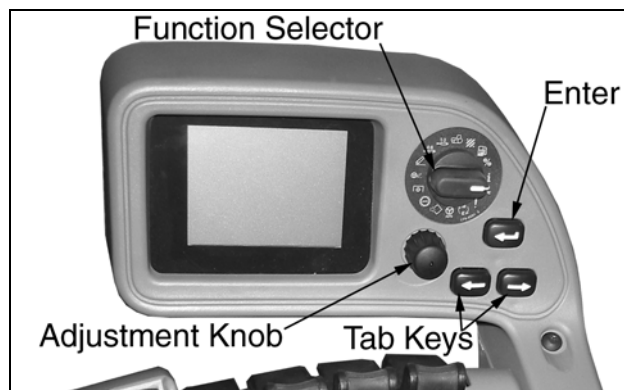
Tractor Management Center (TMC) and TMC Display



Figure 7

The Tractor Management Center (TMC) Display provides the operator with tractor and performance data. Using this information the operator is able to adjust many settings to enhance the tractors performance for each application. The TMC display in the front of the integrated armrest provides maximum view for the operator while providing optimum view from the cab. New screen display technology reflects light and transmits light from a backlight. (Other tractor manufacturers' screens are either reflective or transmissive.) The transreflective LCD display combines these two technologies to create a display that works well in both high light- and low-light conditions. The TMC display provides information in an integrated text and graphic format, making data easier for the operator to understand.

The TMC display provides basic tractor information and alerts the operator of warning events. A Check Monitor indicator light located on the dash panel, and the action alarm, alert the operator to check the monitor for the warning information. Full text descriptions, in addition to codes, are used in the explanation.



TMC Display

Figure 8

The controls for the TMC display consist of the function selector, adjustment knob, enter key, and tab keys. The function selector is used to select the type of information that is displayed on the TMC display. The operator uses the tab keys to select a parameter that needs to be changed. Once the parameter has been selected, the adjustment key is used to change the parameter's setting. The enter key is used to confirm messages, reset service intervals, and clear events.

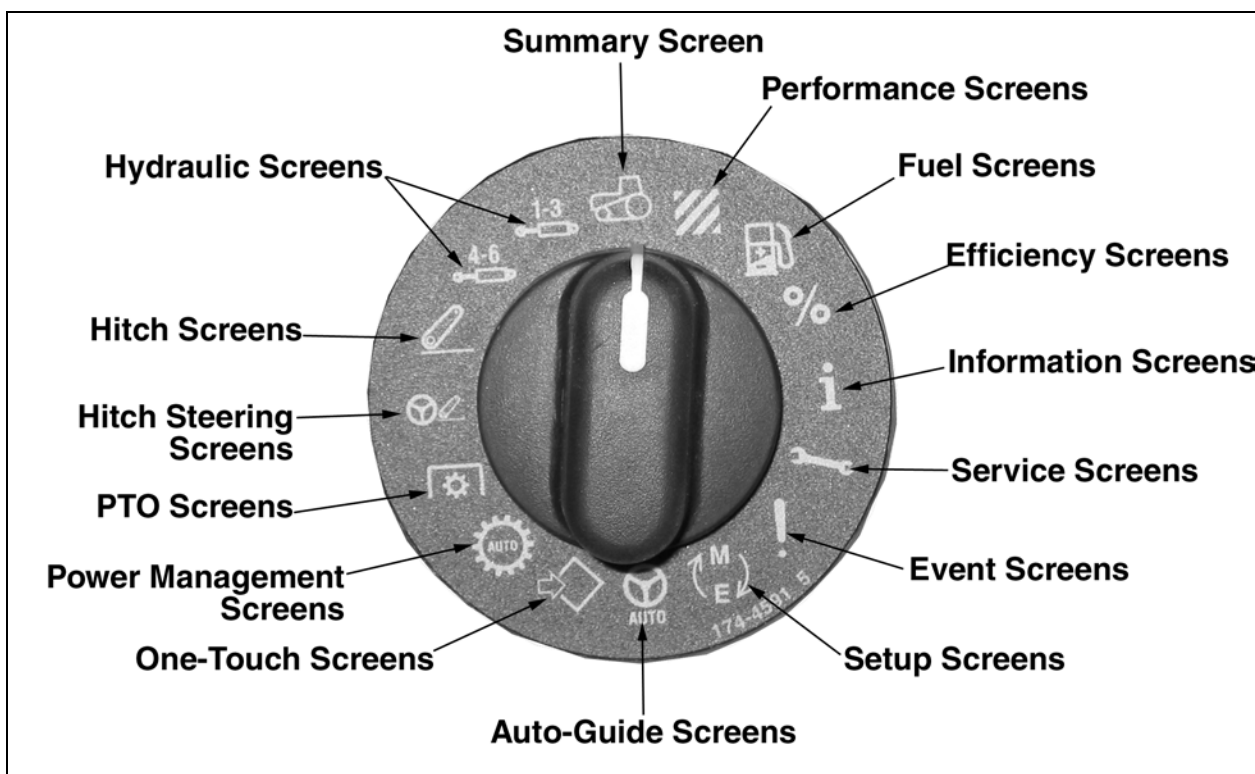


Figure 9

The TMC screens display the following information:

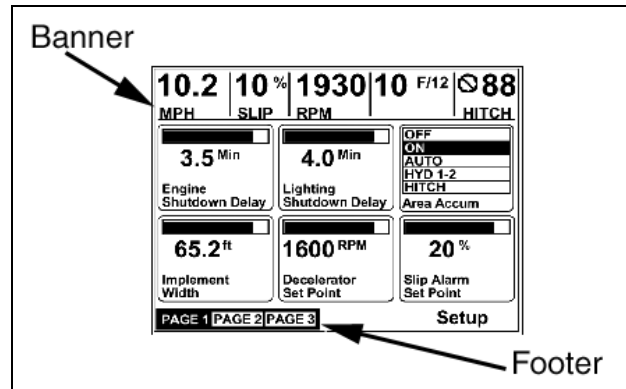


Figure 10

The **banner** is always visible at the top of the display and includes key tractor data such as ground speed, percent slip, engine speed, transmission gear, and hitch status. The **footer**, at the bottom of most screens, describes what screen is currently being displayed.

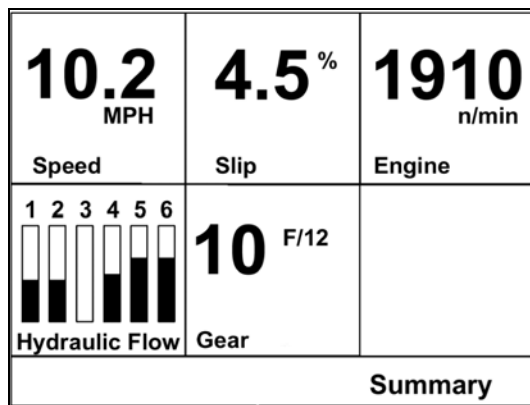


Figure 11

The **summary screen** displays ground speed, percent track slip (when equipped with optional radar), engine speed, selected gear, hydraulic flow rates, service hours, and air tank pressure (if equipped with optional air compressor).

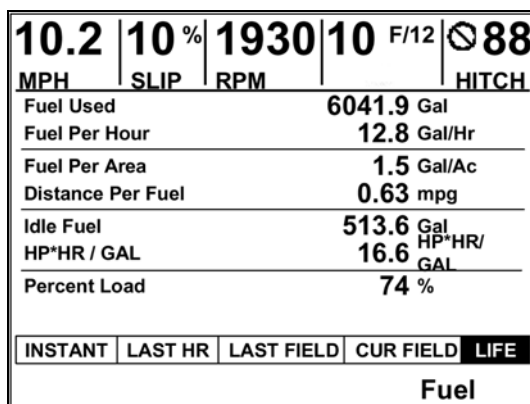


Figure 12

The **fuel screens** display fuel used per hour, fuel used per area, distance per fuel, hp*hr/gal, percent load, and time to empty. This information is available in most timeframes including: instantaneous, last hour, last field, current field, and lifetime totals.

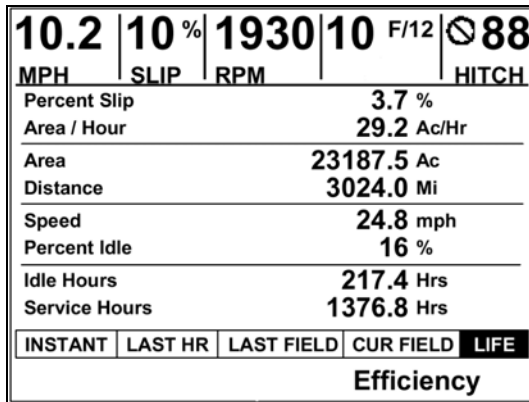


Figure 13

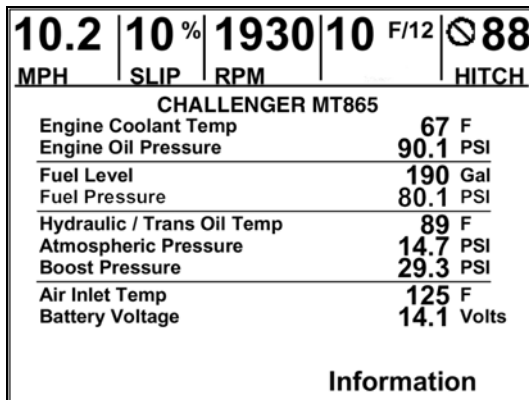


Figure 14

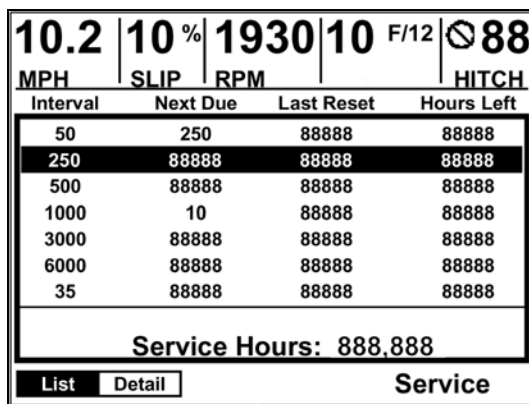


Figure 15

Efficiency screens display percent slip, area per hour, area distance, speed, percent idle, idle hours, and service hours. The information is available in most timeframes including: instantaneous, last hour, last field, current field, and lifetime totals.

The status screen displays engine coolant temperature, engine oil pressure, fuel level, fuel pressure, hydraulic/transmission oil temperature, atmospheric pressure, boost pressure, air inlet temperature, and battery voltage.

Service screens track and display service intervals for the tractor. The operator is able to add one additional service interval of their choice for an implement, etc. The screen displays the interval, when it is next due, when it was last cleared, and hours left before the interval is reached. By selecting the required interval, the operator can review the list of items that require servicing.

TMC will show at what hour the next service interval is due, when the service was last done, the hours remaining until the service must be performed again, and a brief description of what must be done for each service. The user is also referred to the Operation and Maintenance Manual (OMM) for full details of the required service procedure. If the service interval is past due, the amount of hours it is past due will be displayed instead of hours remaining. When the maintenance is performed, the operator will use the TMC display to reset the service interval.

On startup, the TMC display will display any past due service intervals and those due within 10 hours. The operator will have to acknowledge the service interval startup message before the TMC display will display any other screen.



Figure 16

When a service interval is reached after startup, the TMC will notify the operator with a pop-up screen and a level 1 message. (See “Event Screens” for a description of the message levels.)

The following intervals are displayed in the TMC display:

- Every 250 Hours
- Every 500 Hours
- Every 1000 Hours
- Every 2000 Hours
- Every 3000 Hours
- Every 6000 Hours
- User-Defined Variable — The operator can change the range for this interval. There will be no description of what must be done for this interval since it will be a user-defined interval.

Maintenance items that are completed on a “Daily, Weekly, or When Required” basis are not displayed in the TMC display. The operator should consult the Operation and Maintenance Manual for details about these procedures.

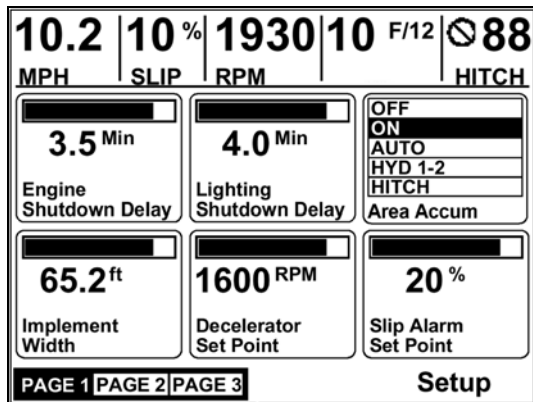


Figure 17

Setup screens are used to set tractor options. Depending on how the tractor is configured, the following functions can be accessed: engine shutdown delay, lighting shutdown delay, implement width, decelerator set point, slip alarm set point, default upshift, default downshift, lights on backlighting, and lights off backlighting. Note: some settings are optional.

The TMC can display information in two different languages. In all cases, one of the two languages will be English. Different languages can be flash downloaded, if desired.

Available languages include:

English
German
Spanish
French

Portuguese
Dutch
Polish
Russian

Italian
Hungarian
Finnish

In addition to the language, the system of units can be changed to match the standard units for each country. Unit systems available are:

	Metric (SI)	English	Imperial
Pressure	Pascal (Pa) & Bar (bar)	Lbs./Inch ² (PSI)	Lbs./Inch ² (PSI)
Temperature	Celsius (C)	Fahrenheit (F)	Celsius (C)
Volume	Liters (l)	US Gal (Gal)	Imp Gal (I Gal)
Area	Hectares (Ha)	Acres (Ac)	Acres (Ac)
Length	m & km	Feet & Mile	Feet & Mile
Time	Hour (hr) & Sec (s)	Hour (hr) & Sec (s)	Hour (hr) & Sec (s)

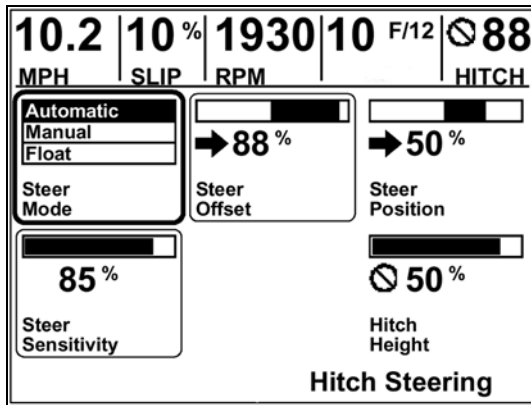


Figure 18

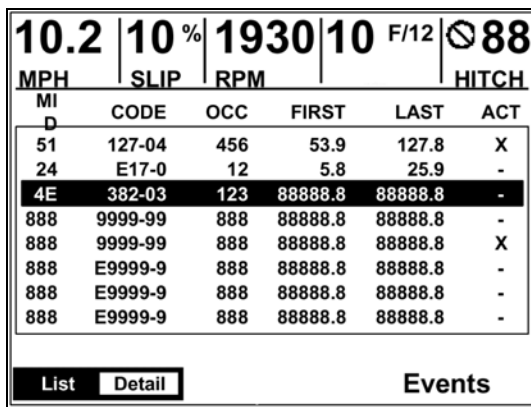


Figure 19

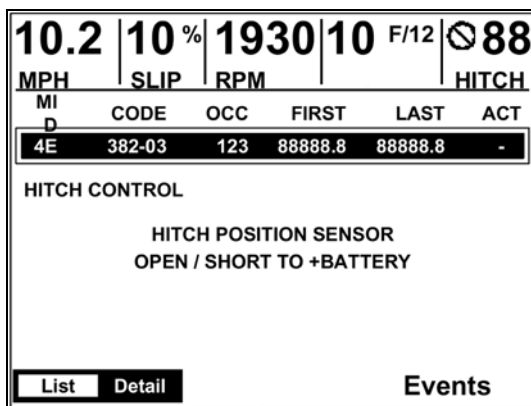


Figure 20

The **hitch steering screen** sets the steerable 3-pt. hitch operational mode to automatic, manual, or float mode. Each mode displays a bargraph and the percentage of hitch offset, steer position, steering sensitivity, and steer dampening. The steerable hitch allows the operator to improve maneuverability when steering under a load.

If the tractor is not equipped with a 3-pt. hitch, the hitch steering screen also allows the adjustment of the powered drawbar position.

Event screens display the detail of critical diagnostics with the appropriate error message.

The TMC display alerts the operator to abnormal tractor conditions. The monitoring system has the following message levels:

Level 0 – Acknowledgement - A level 0 notice is used to acknowledge certain operator actions.

- The alarm horn is OFF.
- The “Check Monitor” indicator is OFF.

Level 1 - Be Aware - A level 1 notice is used to indicate the tractor needs attention soon. No harmful or damaging effects have occurred.

- The alarm horn is OFF.
- The “Check Monitor” indicator is ON.

Level 2 - Change in Machine Operation Required - A level 2 notice is used to indicate that tractor operation should be changed or service performed on the tractor. Possible severe damage to components may occur.

- The alarm horn is OFF.
- The “Check Monitor” indicator is FLASHING.

Level 2 Special - Change in Machine Operation Required As Soon As Possible - A level 2 special warning is used to indicate that tractor operation should be changed or service performed on the tractor as soon as possible. Possible severe damage to components may occur.

- The alarm horn is ON.
- The “Check Monitor” indicator is FLASHING.

Level 3 - Machine Shutdown Required - A level 3 warning is used to indicate that the tractor needs to have a safe engine shutdown immediately. Possible operator injury or severe damage to components may occur.

- The alarm horn is PULSATING.
- The “Check Monitor” indicator is FLASHING.

The ability to snooze an event allows the operator to acknowledge an event that poses no immediate risk to the operator or the safe operation of the machine. Once an event has been acknowledged, it will not be displayed again for a period of time. Level 3 events cannot be snoozed.

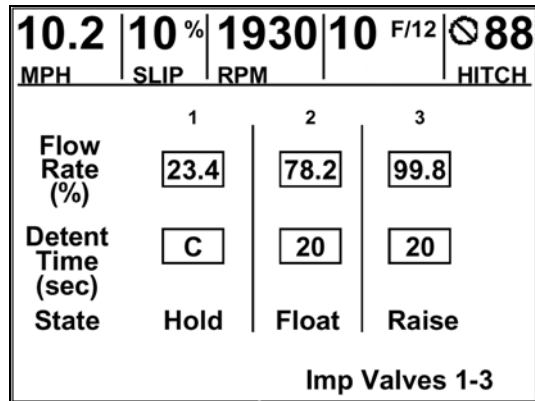


Figure 21

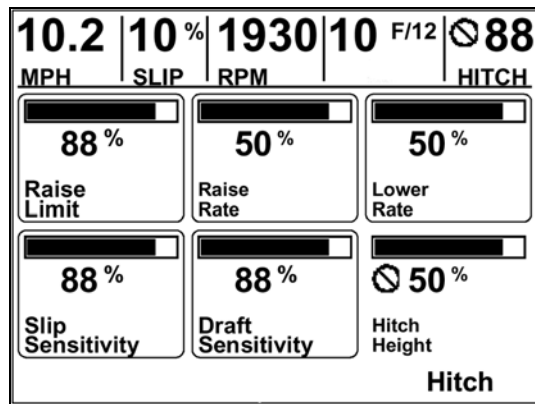


Figure 22

The **hydraulic screen** displays and allows the adjustment of the current hydraulic flow rate and detent time for each implement valve. The screen also displays whether the valve is in HOLD, FLOAT, RAISE, LOWER, or LOCK position. There is one screen for the hydraulic valves 1-3 and a second screen for the hydraulic valves 4-6. Flow rates are displayed in a percentage of available flow and detent times are adjustable from 0-20 seconds. A continuous detent setting is available for operating hydraulic motors.

The **hitch screen** displays and allows the adjustment of the raise limit, raise rate, lower rate, slip sensitivity, and draft sensitivity for the 3-pt. hitch. The hitch screen is only available if the tractor is equipped with the optional 3-pt. hitch.

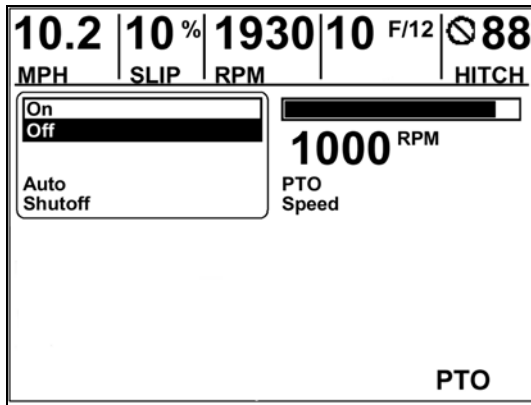


Figure 23

The **PTO screen** displays the PTO speed and allows the adjustment of the auto shut-off feature. The PTO screen is only available if the tractor is equipped with the optional power take-off.

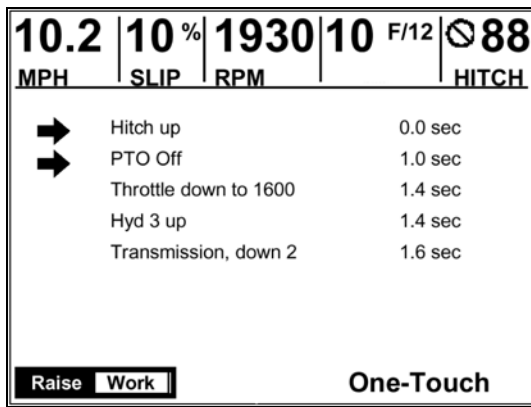


Figure 24

The **One-Touch™ management screen** enables the operator to view the status of the One-Touch feature while the tractor is performing the event or if it is not performing the event.

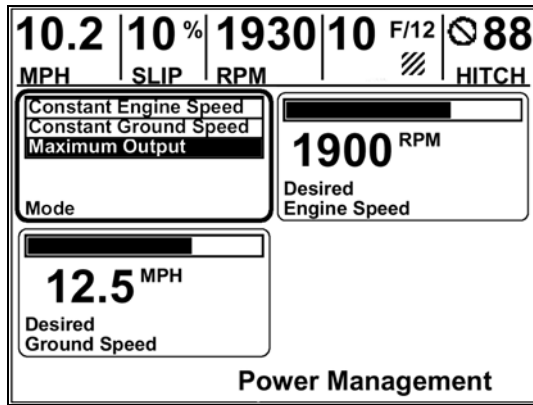


Figure 25

The **Power Management screen** displays a bargraph indicating desired engine speed and desired ground speed. Power Management is a control strategy that varies engine, transmission, and hitch settings to enhance performance of the tractor in particular applications.

In **maximum output** mode, the transmission controller monitors engine speed and load factor, and automatically shifts down when necessary, and then shifts back up again to maximize ground speed, up to the maximum gear selected by the operator. The system will respond to changes in loading by shifting gears.

When the 3-pt. hitch is used in draft control mode, and Power Management is set to maximum output mode, draft control will automatically disengage, and the hitch will move the tool to the current depth control setting. When the power management mode is disengaged, draft control will become active again, at the previous settings.

In **constant engine speed** mode, engine speed is controlled to constant ground and PTO speed in lightly loaded applications. The system maintains engine speed at the selected level without shifting gears. As the throttle is moved forward past the set engine speed, further travel does not result in increased engine speed.

In **constant ground speed** mode, constant ground speed is maintained for lightly loaded applications. Variation in loading is accommodated with changes to engine speed or transmission gear ratio.

Performance Monitor parameters will provide calculated information to improve operator awareness of the operating and performance conditions. Most parameters require that tractor be equipped with the optional radar.

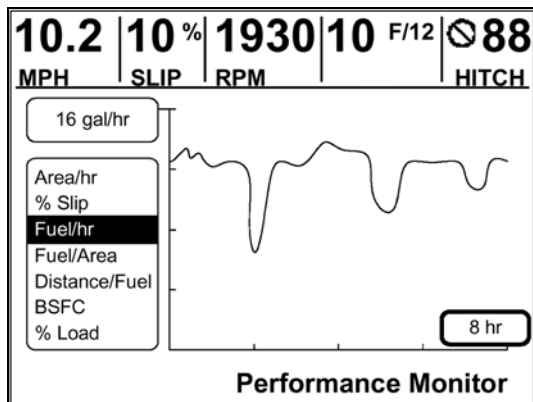


Figure 26

Parameter	Instant	Last Hour	Last Field	Current Field	Lifetime
Area		X	X	X	X
Area/hr	X	X	X	X	X
Distance		X	X	X	X
Ground speed	X	X	X	X	X
Percent Slip	X	X	X	X	X
Idle Fuel		X	X	X	X
Fuel		X	X	X	X
Fuel Rate (fuel/hr)	X	X	X	X	X
Fuel/Area	X	X	X	X	X
Fuel Economy (distance/fuel)	X	X	X	X	X
Power Specific Fuel consumption (HP*HR/GAL)	X	X	X	X	X
Engine Load Factor	X	X	X	X	X
Idle hours		X	X	X	X
Service Hours		X	X	X	X
ECM Hours					X
Percent Idle		X	X	X	X
Est. Time to Empty	X				

Area accumulation mode is a parameter that allows the operator control over how area accumulation is activated. Because the operator would not want to accumulate area while turning on the headlands or roading, area accumulation can be turned OFF for these situations. As the tractor moves through the field, area accumulation will normally be ON.

The operator has four choices for the area accumulation mode: MANUAL, IMPLEMENT, HITCH, or AUTO. In MANUAL mode, the operator turns area accumulation ON or OFF using the TMC. In IMPLEMENT mode, the state of EH Implement Valve #1 toggles area accumulation ON or OFF. In HITCH mode, the position of the rear 3-pt. hitch toggles the area accumulation ON or OFF. In AUTO mode, any combination of MANUAL, IMPLEMENT, OR HITCH can toggle area accumulation ON or OFF.

3.4.2. Dash Panel



Dash Panel

Figure 27

The dash panel displays tractor operating information to the operator as well as generates a visual alarm to alert the operator of warning events. The dash panel consists of the indicator lights, the analog gauges, and the tractor light silhouette.

Five analog gauges are located in the dash panel. When the steering column lighting switch is rotated to the backlighting position, the gauges are backlit. The following gauges are included: Engine RPM, Fuel Level, Hydraulic Oil Temperature, Engine Coolant Temperature, and Engine Oil Pressure.

*Tractor Light
Silhouette*

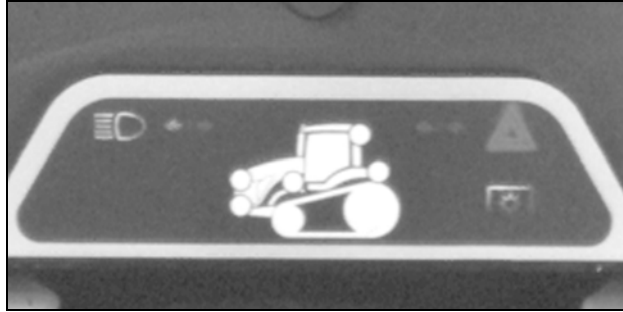


Figure 28

Several operator indicator lights are also located on the front dash panel. The indicator lights include: left turn indicator, right turn indicator, high beam indicator, supplemental steering operating indicator, PTO engaged indicator, and the check monitor indicator.

The dash indicates the active lights by illuminating the corresponding light locations on the tractor silhouette. Lights represented by the silhouette include: park lights, hood lights, high beam lights, partial work lights, full work lights, and rear fender work lights. A high beam indicator located on the front dash indicates when the high beam lights are in use.

3.5. Operator Seat

Operator's Seat



Figure 29

An air-ride seat is standard equipment and provides maximum comfort during long hours of operation on rough terrain. To help ensure that the seat will adjust to virtually any operator, the seat has the following adjustments and features.

Fore and Aft – The seat has 7" (178 mm) of fore-and-aft travel to adjust to operator's size. An adjustment lever is located on the front of the seat for easy access.

Swivel – The seat will swivel by 25 degrees to the right and 10 degrees to the left to make field operation, as well as entering and exiting, more accessible. The 25 degrees of swivel to the right greatly reduces operator fatigue when watching rear-mounted implements. The swivel handle is located at the left front corner of the seat, and can be moved fully rearward to allow the seat to swivel freely throughout the entire range.

Backrest Angle - The seat back has 110-degree range to provide a selection of back support positions needed for operation or full recline for maximum comfort during breaks.

Horizontal Isolation - A handle on the front side of the seat controls the isolator. When in the down position, the seat is fixed. With the isolator in the up position, the seat can travel within the 2" (51 mm) fore-and-aft isolator travel limit. This makes the ride much smoother, especially when operating on rough ground.

Damper Adjustment - A rotating knob on the left side of the seat allows for ride firmness adjustment.

Operator Height/Weight - A rocker switch on the outside of the left armrest adjusts both seat height and suspension. This switch can be pushed up to pump air into the suspension and increase seat height, or pushed down to deflate and decrease seat height.

Lumbar Support - A knob on the left side of the backrest can adjust the amount of lumbar support.

Armrest - The left armrest is hinged to fold back out of the way or down to the rest position. A height adjustment knob is under the armrest. The left armrest can be folded down flush with the seat cushion or positioned in any of three other vertical positions.

Seatbelt - The seatbelt provides maximum safety and convenience. The retractable, 2" (51mm) wide seatbelt uses an anti-cinch design so it will not tend to tighten throughout the day.

Seat Cushion - A thick seat cushion provides ample support and comfort for long periods of operation.

3.6. Heating, Ventilation, Air Conditioning

The heating and air conditioning system provides climate control for the operator in a variety of settings. The Heating Ventilating Air Conditioning (HVAC) system is available in standard or deluxe configurations.



Figure 30

The cab leads the industry with 400 cfm (11.3 m³/min) of airflow provided by the Surround-Flow™ air delivery system, which directs air through vents high and low. Vents on the front console direct airflow from the around the top, sides, and on the operator's feet. The rear left and right ROPS posts are incorporated with air ducting. The recirculation filter is located behind the seat to pull the air around the operator. Vents direct air onto each window to defrost the windows or to create a cool air barrier in the heat of the day. The operator can direct or shut off individual vents as desired. In cooler weather, the MT800 cab has a duct that directs heated air to the operator's feet.

When defrosting or defogging windows, the air conditioning system is automatically activated to help remove moisture from the cab.

The HVAC recirculates 80 percent of the cab air. The paper recirculation filter used in the cab collects dust particles from the air. The cab roof extends past the edge of the cab to shade the cab and keep sunlight off the operator.

The standard air conditioning and heating system controls are located on the right rear cab post. The panel has a rotary fan speed switch with OFF, LOW, MEDIUM, HIGH and PURGE. The second rotary switch varies the temperature settings. A button turns the air conditioner off and on.



*Control Panel for Deluxe
Air Conditioning and
Heating System*

Figure 31

The deluxe air conditioning and heating system control panel replaces the basic control panel arrangement in the deluxe cab. The control panel consists of a temperature display, up and down temperature setting buttons, a rotary mode switch, and the fan speed rotary switch. Three temperature sensors are needed to measure outside, cab, and supply air temperature. One solar sensor is used in the cab.

Operation of the air conditioning system is simple. The operator may select one of three settings: WINDOW DEFROST or AIR TO THE OPERATOR, or a combination of both.

The fan speed can be set at a desired speed or set to AUTO. In the AUTO mode, the fan will adjust the speed and the temperature to maintain the selected temperature.

The air conditioning system reports the temperature the operator has chosen or the operator can read the outside temperature. The display is easily switched from degrees Fahrenheit to Celsius.

3.7. Lighting

Both the standard and optional lighting packages were designed to provide the best lighting in the industry. The headlights improve tractor styling and lighting. The taillights enhance visibility by incorporating the rear work lights into the fender.

The standard exterior lighting package has a better-focused area where the light is needed. The roading and work lighting consists of 12 standard lights:

Rear Work Light Locations (Deluxe Lighting Shown)

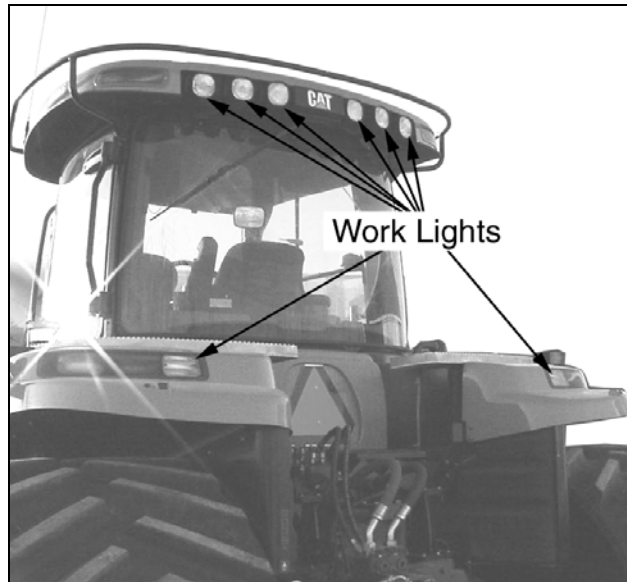


Figure 32

Front Work and Roading Light Locations

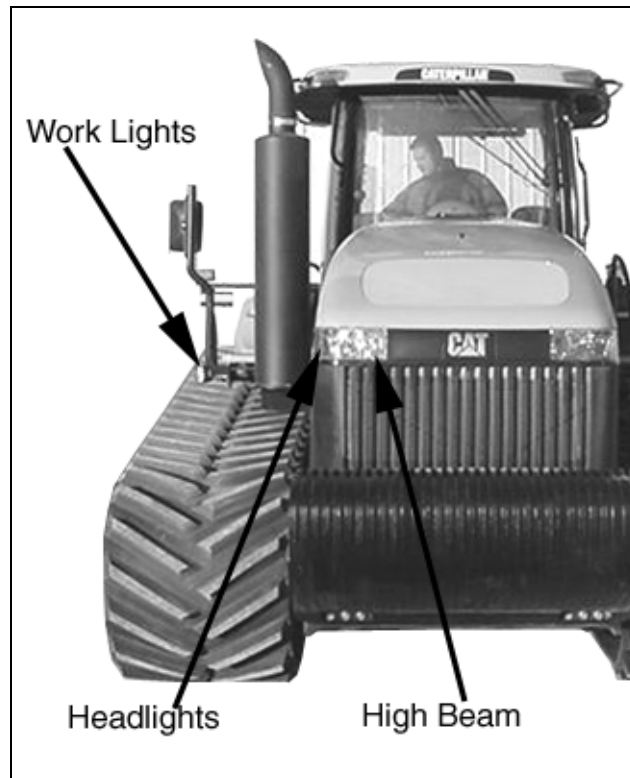


Figure 33

Qty.	Light	Function	Light Location
2	Low Beam	Driving	Hood
2	High Beam	Driving	Hood
2	Side	Work Lights	Hood
2	Front	Work Lights	Inner front belt line
2	Rear	Work Lights	Outer rear roof
2	Rear	Work Lights	Rear fender

Deluxe lighting adds three exterior courtesy lights and four additional rear roof lights are also added.

The switch in the steering column controls many of the light functions. The following list describes the steering column light switch positions.

- Twist Position 1 - Off
- Twist Position 2 - Park/Tail/Backlighting
- Twist Position 3 - Roading Lights
- Pull / Push - High Beam Lights
- Up / Down - RH / LH Turn Lights

The work light switch located in the headliner activates the part and full work light positions. The part work light position activates lights that are closer to the ground. This position is used primarily in foggy or dusty conditions. The full work light position activates all work lights.



Optional Rotating Beacon (One Shown – Package Includes Two Beacons)

Figure 34

Optional rotating beacon lights are available. The rotating beacon rocker switch, located in the headliner, activates both beacon lights. The cab height with the beacon lights installed is 141.4" (3592 mm) versus 135.6" (3444 mm) with the lights removed.

The deluxe cab is equipped with external courtesy lights. The external courtesy lights are made up of three lights: two directed at the rear hitch area and one directed at the entry way to the cab. Rocker switches located in the headliner control the external courtesy lights.

The dome light is used for internal lighting and can be illuminated by either the operator or when the cab door is open. The dome light is equipped with an integral three-position switch (OFF, ON and ACTUATED WHEN DOOR IS OPENED). The dome light is powered directly from the battery.

The delayed light shutdown is included in the deluxe cab. The delayed light shutdown allows exterior lights, and the trailer connector to remain powered for a preset period, and then automatically shut off. The setting for the delayed light shutdown can be set from 0 to 20 minutes in one-minute increments and is changed with the TMC display. The default setting is five minutes. Setting the delay time to zero disables the delayed light shutdown. This feature will provide a lighted pathway for an operator when exiting a barn or a field. The lights controlled by this option are the front work lights at the belt-line, front corner hood work lights and rear fender work lights.

*Extremity
Lights*

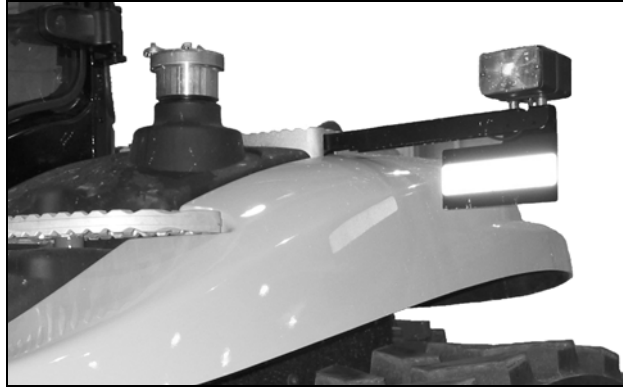


Figure 35

Extremity lighting is standard on Challenger MT800 Series tractors. The extremity lights are adjustable to the gauge of the tractor.

3.7.1. Nightbreaker™ Lighting

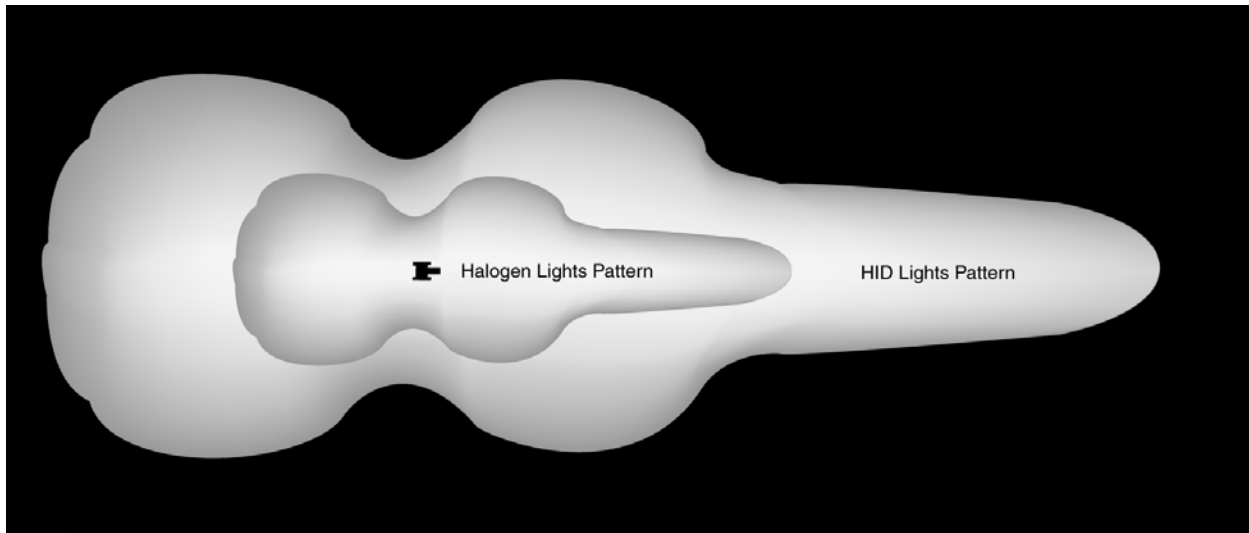


Figure 36

The optional Nightbreaker lighting consists of four High Intensity Discharge (HID) lights, which replace the two innermost lights in the hood and two innermost lights in the rear roofline. The remaining light configuration is the same as the deluxe light package. These lights illuminate the night as close to daylight as any lighting package can, with clear definition of detail from a greater distance than normal halogen lights.

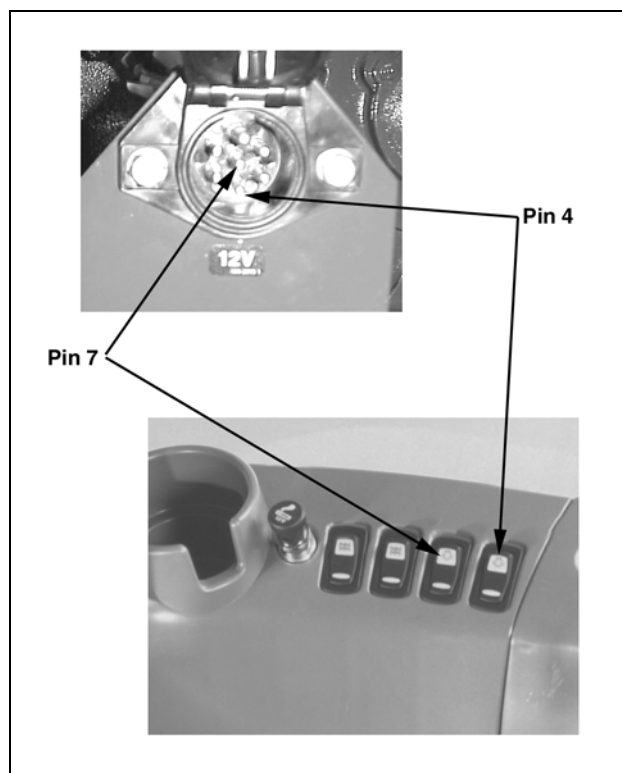
3.8. Electrical



*12-Volt
Receptacle at
Right Rear of Cab*

Figure 37

Each cab comes equipped with one cigar lighter and one 12-volt receptacle as standard. The cigar lighter is located on the lower part of the right rear cab post and the 12-volt receptacle is located near the instructional seat and the cellular phone holder. Both the cigar lighter and the 12-volt receptacle provide up to 10 Amps.



*Seven-Pin Trailer
Connector and
Optional Controls*

Figure 38

A seven-pin trailer connector is standard on the Challenger MT800 Series tractors. Two optional rocker switches located on the lower portion of the right-hand rear cab post activate the two auxiliary power connections on the seven-pin trailer connector (pin 4 and pin 7). Both auxiliary pins provide up to 10 Amps.

Optional Power-Pack™ Accessory Power Outlet's Terminal Strip

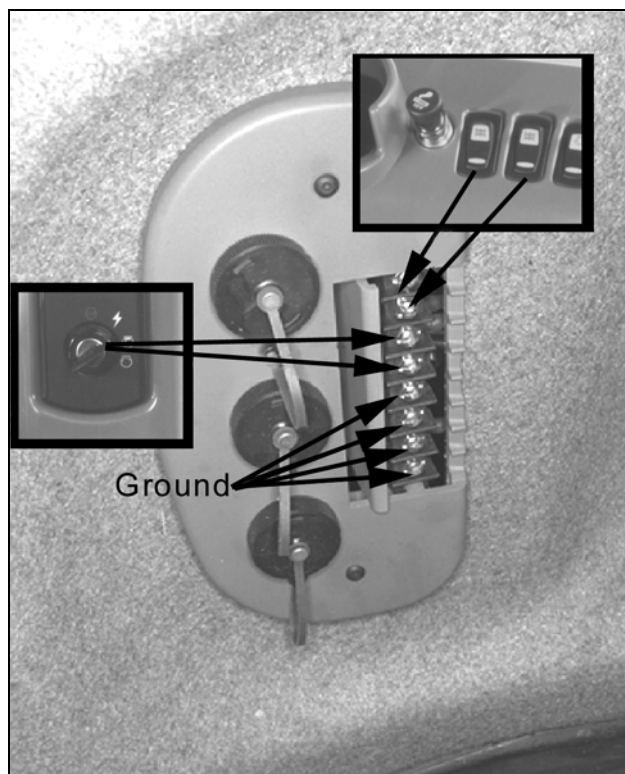
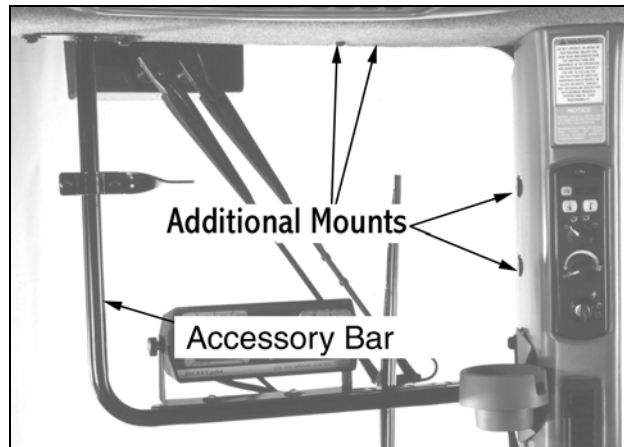


Figure 39

The Power-Pack™ accessory power outlets, located in the lower right hand corner of the cab, provide power and grounded circuits for customer-added attachments such as planter controls, spray monitors, communication devices, etc. The terminal strip provides four attachment connections. The top two screw terminals, providing up to 20 Amps each, are activated by two rocker switches which are located in the lower right corner of the cab. The next two terminal screws, providing up to 20 Amps each, are powered whenever the key switch is in the RUN position. The bottom four screw terminals are for ground connections.

The Power-Pack also includes two additional ag standard power plugs. All standard and attachment power plugs are located on a separate panel behind the seat. One standard power plug is provided on the tractor. Each of the power plugs has three pins. The single pin on the bottom is the ground connection. The upper pin on the left is a 30-Amp pin that is powered whenever the engine start switch key is in the RUN position. The upper pin on the right is a 10-Amp pin that is powered directly from the battery.

Power-Pack is standard in the deluxe cab and an optional attachment in the standard cab.

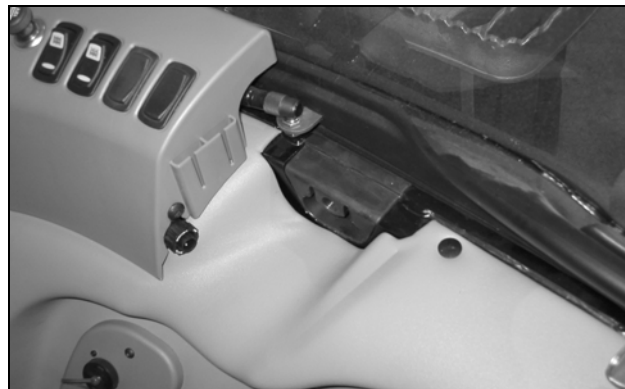


*Optional
Accessory Bar*

Figure 40

The optional accessory bar is designed to present optimal viewing when mounting additional monitors in the cab. Above the accessory bar, there are two additional mounting points with hardware.

The optional radar provides the operator with true ground speed of the tractor. The radar speed is used in conjunction with the transmission speed to determine track slip. A connector is located in the cab to provide implement monitors with the ground speed signal. Radar is required to enable the performance monitor features of the TMC display.



*Installing
Implement Cables
into Cab*

Figure 41

A rubber grommet below the rear window frame provides a means for routing cables from implement into the cab without sacrificing cab sealing.

A GPS antenna can be attached to the optional roof bracket on the tractor. The roof bracket has been designed to accommodate a wide variety of antennas.

The service connector provides a means of receiving and transmitting tractor information through an off-board service tool, such as Caterpillar Electronic Technician (ET). The service connector provides data link connections to allow the service tool to communicate to other controls on the tractor. The service tool connector is located under the instructional seat for ease of connection.

3.9. Operator Convenience

3.9.1. Optimal Visibility

Visibility is excellent over the hood, from the rear and sides to the implement, and from the rear up to a grain cart. The rear of the hood is narrow for improved visibility to the rows. The hood's aggressive slope improves visibility where the operator needs it most.

The lower rear work lights are incorporated into the fender to remove them from the operator's view. In addition, the rear cab posts are positioned forward to increase operator visibility to the rear of the tractor. Mounting holes for chemical tanks put the tanks at the side of the tractor where they do not obstruct the operator's view.

3.9.2. Instructional Seat

*Instructional Seat
Provided for
Training New
Operators*



Figure 42

The standard instructional seat has an incorporated, retractable seatbelt. The fully padded seat and backrest provide a comfortable seating location for an instructor.

The instructional seat doubles as a computer platform or work area when the seat back is folded down. The optional six-disc CD changer is installed beneath the lower cushion. A large storage area for coolers provides a convenient, yet out of the way, storage area. The optional sub-woofer is installed at the rear of the storage area.

3.9.3. Full Coverage Front Wiper/Washer



*Full Coverage,
Parallel Sweep
Front Wiper in
Parked Position*

Figure 43

The **standard wiper package** includes a two-speed, parallel sweep front wiper, which covers more glass than conventional wipers. This is accomplished by designing the wiper to go behind the hood to wipe areas impossible to reach with a typical V-wiper. The windshield wiper improves visibility in dust, rain, mist, spray applications, rice fieldwork, etc.

The **deluxe wiper package** contains an intermittent front wiper/washer that provides infinitely intermittent wiper speeds, as well as low and high constant speeds. A single speed rear windshield wiper motor and washer package, included with the deluxe wiper package, provides additional wiping and washing capability. A rotary switch is located in the headliner that controls the rear wiper and washer functions. The deluxe wiper package is optional on standard cabs and standard on deluxe cabs.

A dealer-installed right **side wiper** with parallel sweep and washer package is available. The rear wiper switch is used to control both rear and side wiper and washer functions.

3.9.4. Washable Floor Mat

The floor mat is designed for ease of cleaning. The edge of the mat has a lip, preventing water from getting under the mat. Grooves in the floor leading to the door provide quick, easy cleaning with a broom, or the floor mat can be hosed out with water. The design of the floor mat prevents water from getting underneath.

3.9.5. High Performance Sound System

*Three Radio
Options Available*

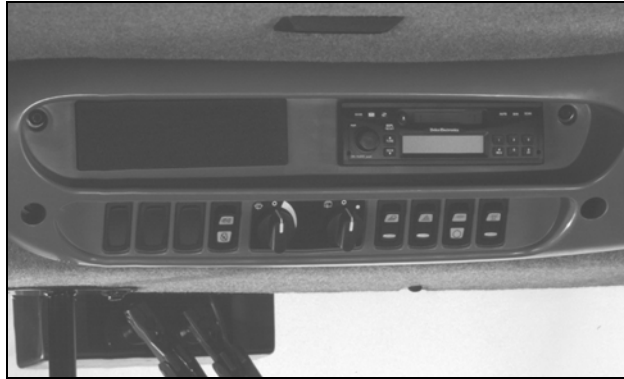


Figure 44

The standard tractor is equipped with a high-grade antenna and wiring for a radio and four installed speakers. With the deluxe cab, the tractor comes with an antenna and wiring for all radios, including a communications radio. A second DIN slot is installed in the headliner for easy installation of a communications radio or GPS receiver.

Dealer-installed radio attachments include a standard AM/FM cassette radio with weather band, a deluxe AM/FM cassette radio with weather band or a deluxe single CD AM/FM radio with weather band. A ledge below the radio provides a convenient place to rest the hand when making radio adjustments. The deluxe radios are compatible with the optional remote mounted radio controls in the steering wheel.

*Optional Steering
Wheel Mounted
Radio Controls*



Figure 45

Steering-wheel-mounted radio controls aid in improving operator comfort. Remote radio controls are available in the steering wheel as a factory-installed attachment. The controls that are in the steering wheel are: volume increase or decrease, mute, seek, scan, change function from radio to cassette or CD. One of the deluxe radios is required for the remote radio controls to function.

The speaker package contains four high-quality 15-watt speakers. Placement of the speakers was determined through rigorous acoustic analysis of the cab.



*Dealer-Installed
CD Changer and
Optional
Subwoofer*

Figure 46

An optional amplified subwoofer is available from the factory or as a dealer-installed option available through the Parts system. The subwoofer is located under the instructional seat.

A durable heavy-duty six-disc CD changer is available. The six-disc changer requires one of the deluxe radios to operate. The CD changer is installed in the compartment below the instructional seat.

3.9.6. Storage

A cell phone holder is located near a 12-volt outlet for easy and convenient use on the left rear post. A coat hook in the rear left corner is conveniently placed to provide an out-of-the-way location to hang jackets.

Between the operator's seat and the instructional seat is a large area to store papers or other important items. The cargo net is made of an elastic material that allows storage flexibility and keeps items from moving about.

There is a storage compartment behind the instructional seat. Because the storage compartment is surrounded by air from the heating and air conditioning system, it is an ideal place to store food and drinks.

Lifting the hinged armrest pad at the rear of the TMC allows access to a convenient storage area for CDs or other items. The cab is equipped with three different beverage holders designed to fit different sized containers.

3.9.7. Reverse Alarm

The optional reverse alarm sounds when the transmission control lever is moved to the reverse position.

3.9.8. Mirrors

*Optional Mirrors
Mounted for
Optimal Visibility*



Figure 47

Each cab is equipped with a rearview mirror inside of the cab. Manual external mirrors are available for the standard cab. The deluxe cab includes electric external mirrors, which can be adjusted and heated by using controls located on the TMC. The external mirrors are mounted to the cab suspension to provide clear visibility when the tractor is in motion.

3.9.9. Cab Walk-Around



Figure 48

Challenger MT800 tractors feature full walk-around access to the cab, making light adjustment, fueling the tractor, and cleaning windows easier.

4. Mobil-trac™ System

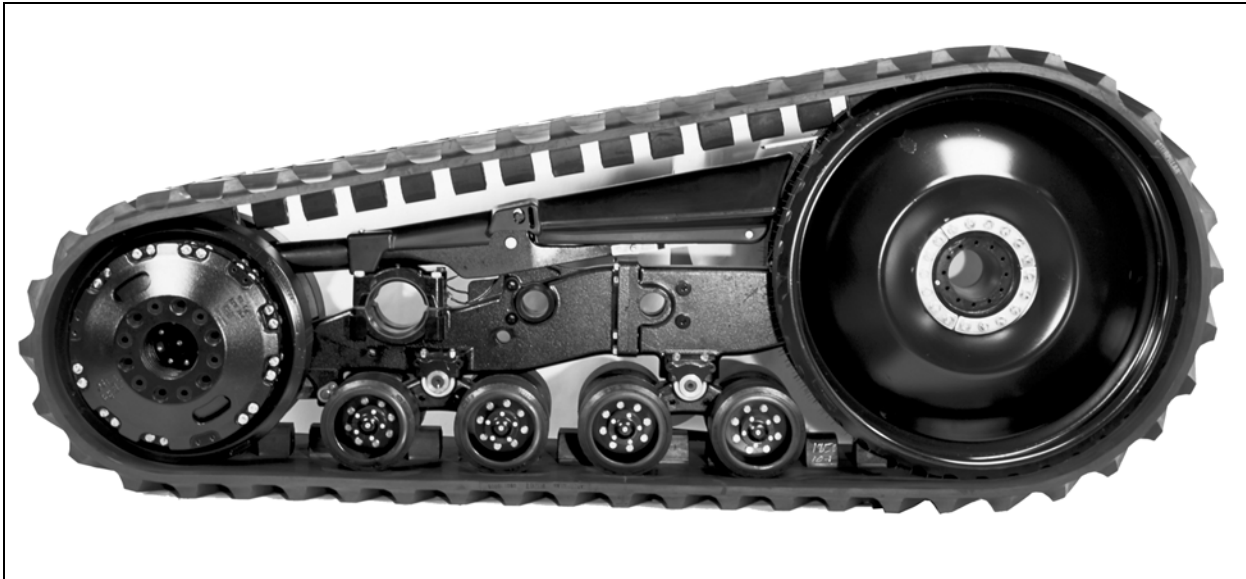


Figure 49

The Challenger MT800 Series tractors incorporate Caterpillar's proven and established Mobil-trac system with the latest technology to deliver a new standard. This system couples the speed, mobility and versatility of rubber tires with the traction, flotation, smooth field ride, and low compaction of tracks. The five-axle design significantly lowers axle loads, reducing the deep compaction that restricts plant root growth. The system relies on high belt tension to create friction between the driver and belt to propel the tractor. The gauge range on MT800 Series tractors is 90 – 128" (2286 – 3251 mm).

Caterpillar invented rubber-belted ag tractors and designs and manufactures the key components of the patented Mobil-trac system, including belts, drivers, idlers and midwheels. Years of experience and complete control of design and manufacturing ensure an integrated system that will deliver maximum, reliable performance.

The major components of the Mobil-trac system include belts, drivers, idlers, midwheels, belt tensioning system, hardbar, track roller frame, minor bogies, and chassis suspension.

Key Features of the Challenger MT800 Series Mobil-trac system:

- Belt widths available from 18 to 36" (457 to 914 mm) ; all with centered guide blocks
- Belts available for special applications
- Two wheel widths to match belt selections
- Chassis suspension
- Suspended midwheels
- Simple gauge adjustment (no spacers needed and detensioning is not required)
- Improved belt-to-driver grip
- Long wheelbase
- Large diameter driver
- In-line reaction arm
- Superior road and field ride
- Improved belt retention

- Superior debris rejection
- Improved crop clearance
- Improved durability
- Improved belt alignment

4.1. Belts

Four belt widths are available. All belts have centered guide blocks. The rubber belt transfers axle power from the drivers to the ground. More than one kilometer (two thirds of a mile) of cable provides tensile strength to withstand loads imposed by the tensioning cylinder and tractor operation. The “zero degree” circumferential cable prohibits the belt from stretching under 25,000 lbs. (111.2 kN)) of belt tension, or a total of 50,000 lbs 222.4 kN) of total force. Breaker plies, located between the zero degree cable and the outside diameter of the belt surface provide belt rigidity and protection for the zero degree cables.

Guide blocks center the belt on the driver and idler wheels. Guide blocks are made of a special hard rubber to reduce scuffing and wear. Each component in the belt, guide blocks, carcass, and treadbars all have their own unique rubber compound best suited for the purpose. This maximizes life and increases durability of the components. The guide blocks are either 4.5" (115 mm) long on general ag belts and 5.3" (135 mm) long on extreme application belts. Each belt has a total of 52 guide blocks.

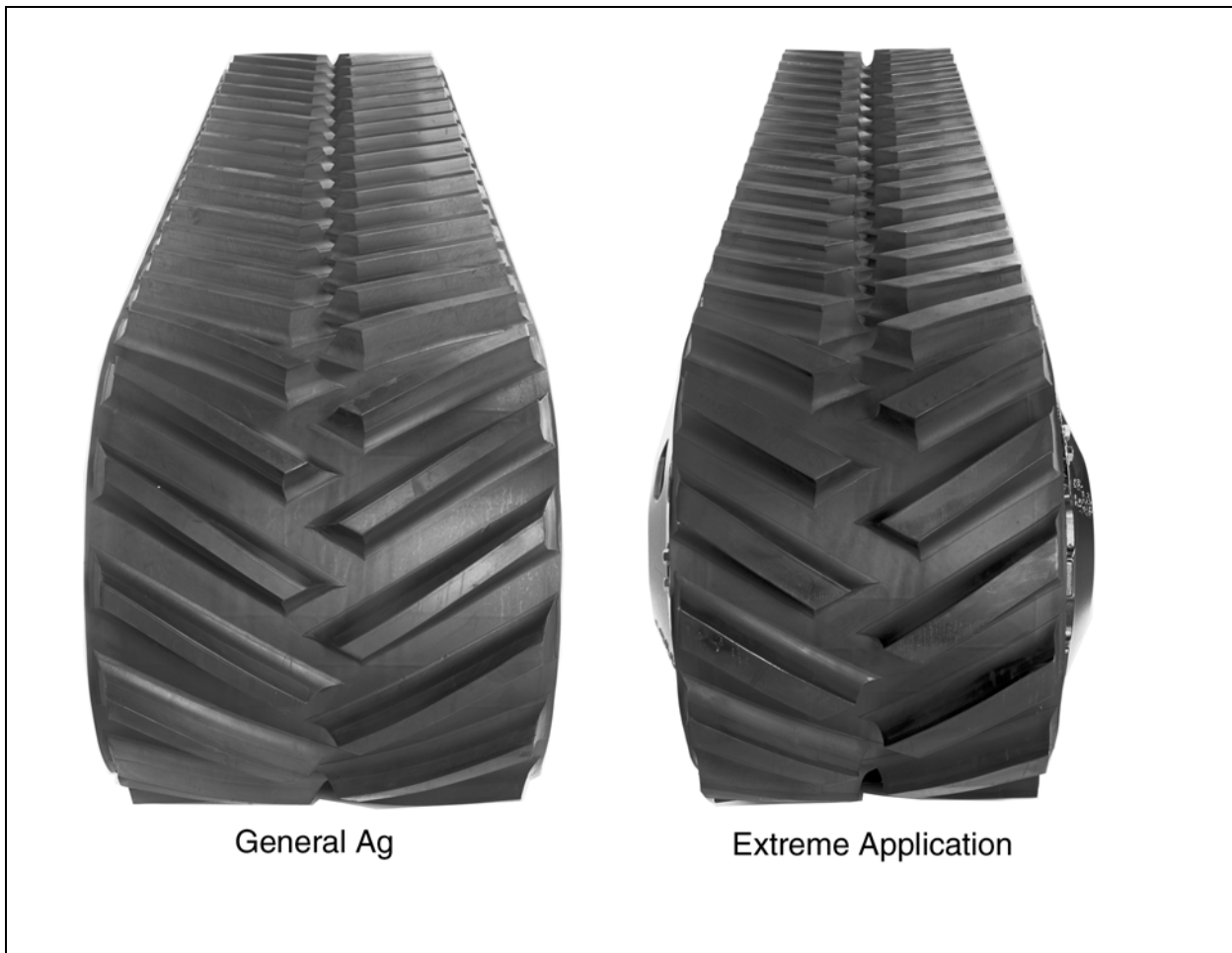


Figure 50

Two types of belts are available: general ag belts and extreme application belts. Due to the longer wheelbase of the Challenger MT800 Series undercarriage, these belts are not compatible with other tractors.

General Ag Belts are well suited for the majority of agricultural applications. The conventional chevron pattern is used on the belts to optimize treadbar life and for effective clean-out of material between the treadbars.

The **Extreme Application Belts** are designed to replace general ag belts in tough applications such as pulling scrapers, side hills, and high roading applications. Examples range from more abrasive underfoot conditions such as sugar cane residue, rocky soils, higher-than-average percentage of time spent traveling on paved roads or operating

in terrains where steep side slopes exist. When any of these conditions exist, the extreme application belt is recommended to extend belt life. The construction of the belt consists of longer guide blocks for better belt retention, increased treadbar height to 3" (75 mm), larger diameter zero-degree cables and an additional layer of 90-degree breaker cables and rubber at the inner diameter.

4.2. Belt Specifications

Part Number	Belt Width	Belt Type	Number of Treadbars	Treadbar Angle	Treadbar Height	Tip Width	Number of Guide Blocks	Belt Weight
1R-1264	18" 457 mm	Extreme Application	100	30	3" 75 mm	2.5" 64 mm	52	1119 lb 507 kg
1R-1265	27.5" 699 mm	General Ag	100	30	2.7" 68.5 mm	1.6" 41 mm	52	1373 lb 623 kg
1R-1323	27.5" 699 mm	Extreme Application	100	30	3" 75 mm "	2.5 "64 mm	52	1571 lb 713 kg
1R-1266	30" 762 mm	General Ag	100	30	2.7" 68.5 mm	1.6" 41 mm	52	1485 lb 674 kg
1R-1325	30" 762 mm	Extreme Application	100	30	3" 75 mm	2.5" 64 mm	52	1701 lb 772 kg
1R-1267	36" 914 mm	General Ag	100	30	2.7" 68.5 mm	1.6 "41 mm	52	1827 lb 829 kg
1R-1360	36" 914 mm	Extreme Application	100	30	3" 75 mm	2.5" 64 mm	52	1991 lb 903 kg

Note: Not all belts are compatible with all track gauges.

Gauge	Available Belt Widths
90"	18", 27.5" (457 mm, 699 mm)
91"	
92"	
93"	18", 27.5", 30" (457 mm, 699 mm, 762 mm)
94"	
95"	
96"	
97"	
98"	
99"	18", 27.5", 30", 36" (457 mm, 699 mm, 762 mm, 914 mm))
100"	
101"	
103"	
104"	
105"	
108"	
109"	
110"	
111"	
112"	
113"	
114"	
115"	
116"	
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124"	
125"	
126"	
127"	
128"	

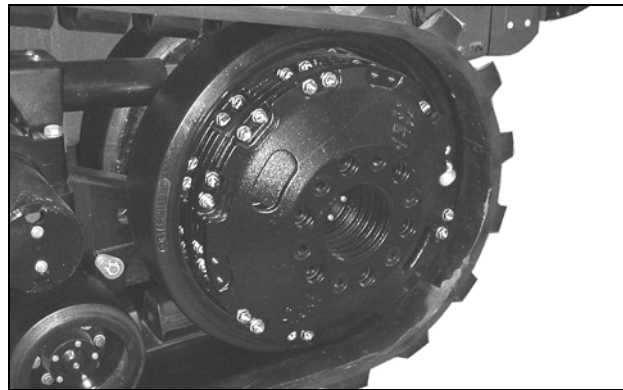
4.3. Idler, Midwheel, Driver

Two widths of wheel components are available. This enables the wheel width to be matched to the belt width, which increases belt life, improves flotation, reduces compaction and improves the wheels' wear characteristics. The wheels are available in two widths: medium, and wide. The idler widths are: 5" (127 mm) and 8.38" (214 mm). The midwheel widths are: 5.2" (132 mm) and 8.8" (224 mm). The driver widths are: 5.5" (140 mm) and 8.8" (225 mm).

Below is a chart illustrating the required, compatible, recommended and non-compatible recommended wheel and belt combinations. Properly matched wheels and belts will improve wheel life and belt wear. The driver, idler, and midwheel each have different rubber compounds.

Belt width	18" (457 mm)	27.5" (699 mm)	30" (762 mm)	36" (914 mm)
Idler				
Medium	Required	Compatible	Compatible	Compatible
Wide	Non-compatible	Recommended	Recommended	Recommended
Midwheel				
Medium	Required	Compatible	Compatible	Compatible
Wide	Non-compatible	Recommended	Recommended	Recommended
Driver				
Medium	Required	Compatible	Compatible	Compatible
Wide	Non-compatible	Recommended	Recommended	Recommended

4.3.1. Idlers



Idler

Figure 51

The 37" (950 mm) diameter idlers are coated with rubber material. The idler, the largest in the industry, reduces rolling resistance, which improves tractor efficiency. The idler is smooth for reduced vibration. The idler width should be chosen such that the belt is wider than the outside surface of the idler by at least an inch. Overlap of the belt on the idler enhances belt tracking.

The larger idler, in combination with the larger driver, improves crop clearance. Increased idler diameter also allows more weight to be placed on the idler for better balance.

*Maintenance-Free
Swing Link*

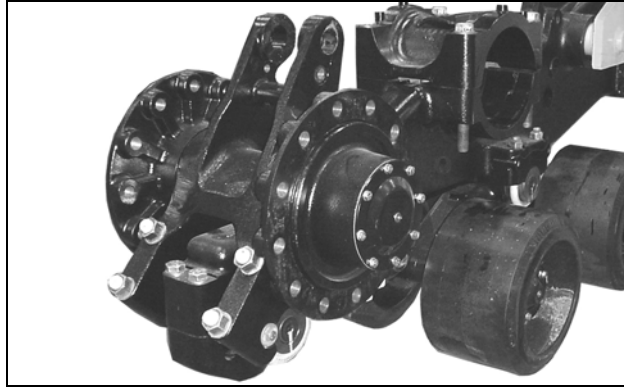


Figure 52

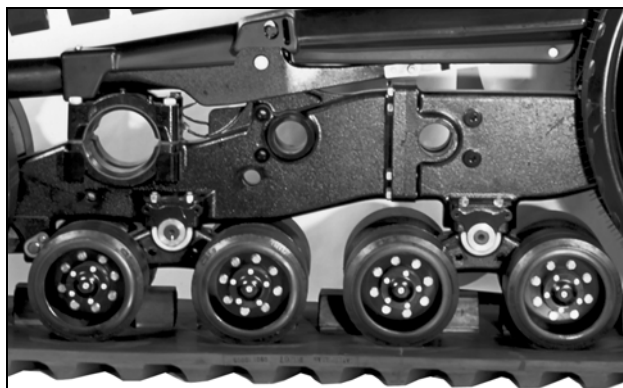
The idler's swing link pivot shaft is maintenance-free, oil-filled, fully-sealed joint.

4.3.2. Midwheels



Figure 53

There are eight (four pair) 14" (356 mm) diameter midwheels on each undercarriage. The midwheels are coated with a new rubber compound formulation that is designed for increased life and maximum durability. The midwheels are made up of two main components: a wheel and a hub. Having two separate components helps reduce long-term owning and operating cost of the tractor. Having separate components improves flexibility so a tractor can be easily converted to different wheels and belts season to season if desired.



*Suspended
Midwheels
Improve Ride on
Uneven Terrain*

Figure 54

The midwheels are suspended to provide movement between each pair of wheels for load sharing on uneven terrain and to improve ride. The joints are maintenance-free.

4.3.3. Drivers



Figure 55

The largest driver in its class, in conjunction with 25,000 lbs (111.2 kN) of belt tension, maintains plenty of belt-to-driver grip in slippery conditions. A chevron pattern maintains optimal drive characteristic throughout its life with excellent mud rejection. The width of the grooves is optimized for mud rejection and driver grip.

The belt guide block-to-driver edge is optimized to maximize belt retention in even the most grueling applications. The outside rolled edge on the drive wheels improves structural integrity. A special rubber compound was developed for increased life.

4.4. Hardbar

*Round Hardbar
Provides Quick
Gauge Changes*

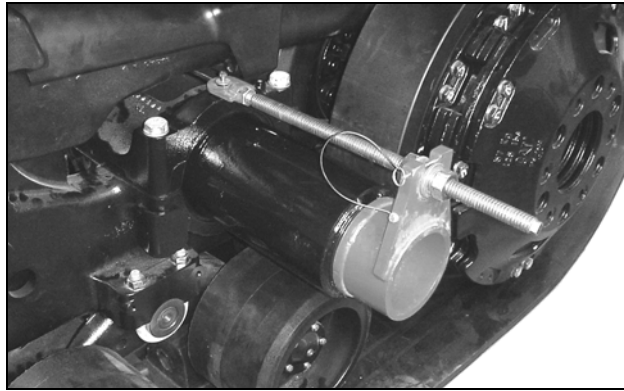


Figure 56

The hardbar, measuring 8" (203 mm) in diameter, connects the tractor frame to the Mobil-trac system. The Challenger MT800 Series tractors use a round hardbar design for smooth crop flow below the tractor. The hardbar's design allows the track gauge to be quickly changed because the in-line reaction arm allows gauge changes without detensioning the belt. To change the track gauge, simply loosen four bolts on each hardbar cap and loosen the collet bolts on the driver. Then, the Mobil-trac system can be infinitely adjusted within its limits: 90 – 128" (2286 – 3251 mm).

*Marsh Mellow®
Springs Isolate the
Chassis from the
Undercarriage*

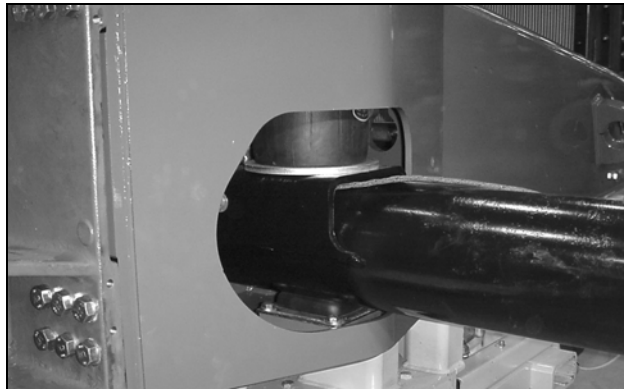
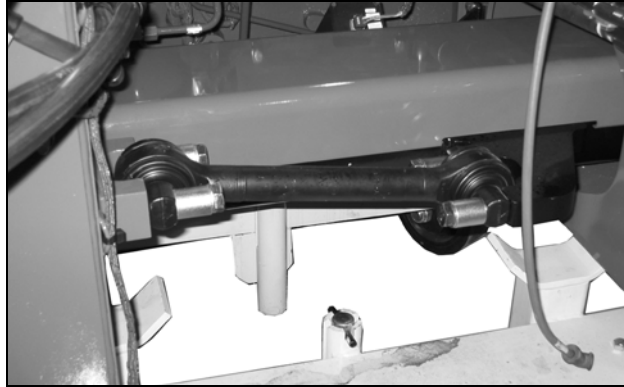


Figure 57

The hardbar is isolated from the chassis of the tractor by two Marsh Mellow springs*. These springs, constructed of layers of rubber and fabric, soften shock loads. Wheel ride and track ride were intensely studied and modeled for the suspension characteristics, to provide the operator with the best overall ride in the field and on the road. The combination of positive belt contact with the ground and a carefully tuned suspension provide the same level of ride comfort as a wheeled tractor without the annoying side-to-side movement generated from sidewall deflection and tire lope of the tires. The maintenance-free rubber isolation springs are compressed between the hardbar and the tractor main structure.

* Marsh Mellow® spring is a registered trademark of Firestone Industrial Products Company



*Stabilizer Bar
Enables the
Undercarriage to
Have Independent
Motion for
Superior Ride*

Figure 58

A robust stabilizer bar controls the lateral position of the hardbar. The stabilizer bar enables the left and right roller frames to rise up and down together or independently, providing superior ride.

The hardbar can tilt to a 3.1 degree angle, which means that one end of the hardbar can be 4.5" (114.3 mm) higher than the center at 128" (3251 mm) gauge.

4.5. Roller Frame and Tensioning System

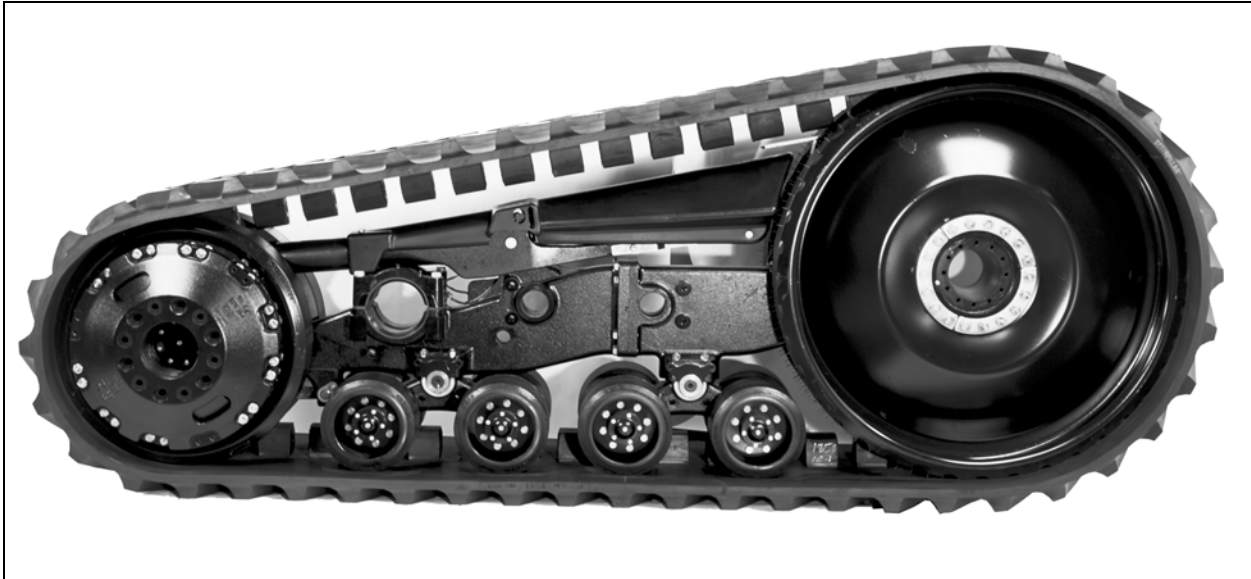


Figure 59

The length of the Mobil-trac undercarriage is the longest in the industry, maximizing traction and balance while minimizing compaction, even with narrow belts. The long wheelbase of Challenger MT800 Series, 118.1" (3000 mm), improves fore-and-aft stability, which provides the best balance of any track tractor. The undercarriage is very robust, and built to Caterpillar standards. A one-piece tensioner casting adds to the designed-in reliability. The in-line design provides optimal belt alignment and debris rejection.

*Chemical Tank
Mounting Holes in
Undercarriage*



Figure 60

Like that on the Challenger MT800 Series tractors, the undercarriage has built-in mounting holes for chemical tanks. These holes are the same size as was found on the Challenger MT800 Series tractors. Chemical tanks of up 450 U.S. Gal (1703 L) can be used. Chemical tank mounts can support up to 4500 lb (2041.1 kg) on each side.

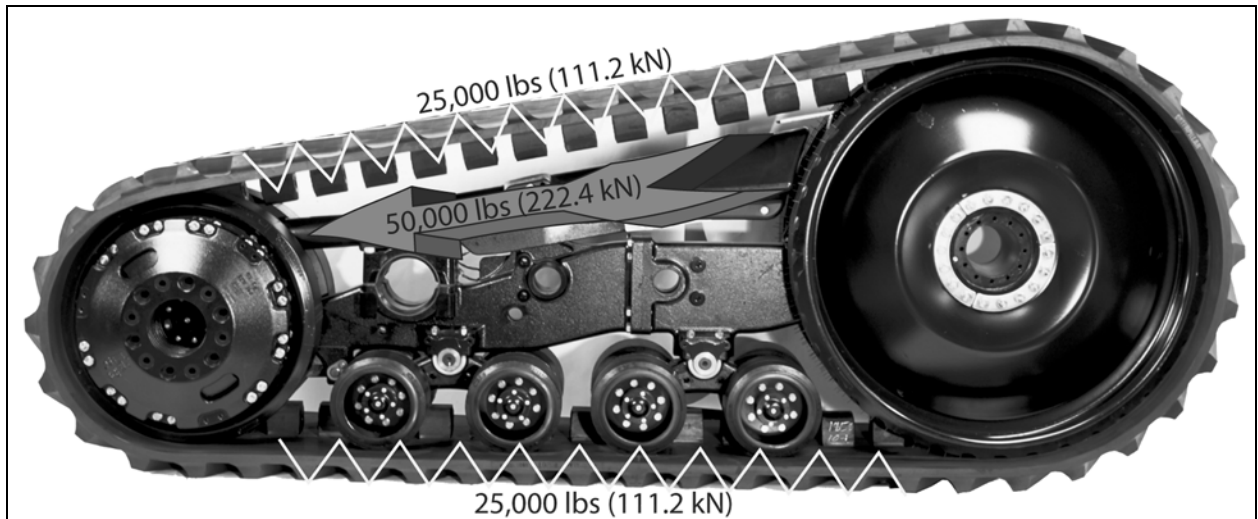
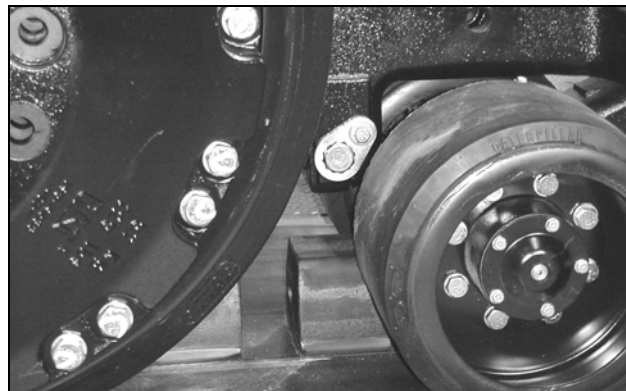


Figure 61

The track tensioning system is similar to the system used on the Challenger MT700 Series tractors. The belt is tensioned with a hydraulic cylinder that pushes against a pivoting swing link attached to the track roller frame. The hydraulic tensioning system is self-contained and can be charged or released via the tractor's implement hydraulic system. There is a quick-coupler located on the tensioner for easy hook-up to implement hydraulic system for tensioning/detensioning the system. When fully charged at the 2900 psi (20100 kPa) implement hydraulic relief pressure, the tensioning system provides 50,000 lbs (222.4 kN) of force for a nominal belt tension of 25,000 lbs (111.2 kN). This is a 39 percent increase over the previous E-Series Challenger tractors. An integral bladder-type nitrogen accumulator provides the ability for the tensioning cylinder to compress/extend as needed to maintain necessary belt tension. For added durability, the tensioner cylinder is dual-coated with both nickel and chrome. A belt tension warning system alerts the operator if the belt tension drops below a pre-set value. The switch is electrical versus the mechanical sensor used on previous models.

A high-impact plastic guard protects the tension cylinder and accumulator. In order to remove the guard, the tension cylinder bleed screw must be removed. Therefore, the track tensioning components cannot be serviced while the belt is under tension.



*Belt Alignment
can be Quickly
Adjusted While
Belt is Tensioned*

Figure 62

The front idler can be adjusted for proper belt alignment even while the belt is tensioned. Two bolts that push the entire front idler and swing link left or right do this. This feature allows for quick and easy belt alignment should it be necessary.

The internal reaction arm extends from the roller frame assembly to the drivers. As on previous Challenger tractors, the reaction arm isolates the high belt tension from the tractor's main structure. The hub uses oversized tapered

roller bearings, bathed in oil, to transmit the belt tension forces to the rear axle. A tapered hub arrangement permits unlimited gauge spacing possibilities within the total range of gauge adjustment. The gauge adjustment with the in-line, internal reaction arm can be accomplished while the belt is fully tensioned. This unique straight reaction arm design maintains a straight load on the belt, which allows the adjustment to be done without detensioning. Unlike any competitor or previous Caterpillar design, this design reduces the complexity and time required to make gauge changes. An internal reaction arm minimizes debris build-up on the reaction arm reducing debris being pulled in between the belt and driver enhancing tractor performance and minimizing clean up time for the customer.

4.6. Performance Improvements

Efficiency and balance improvements are, in part, from the longer undercarriage; an additional 11" (279 mm) on the ground than previous models. This optimizes the tractor's pulling ability while keeping a narrow footprint. In general, it is recommended to use the widest belt possible for an application to maximize belt life, flotation and minimize compaction but narrow enough to achieve treadbar penetration for maximum pull. Matching wheel width to belt width ensures more even belt wear and longer belt life.

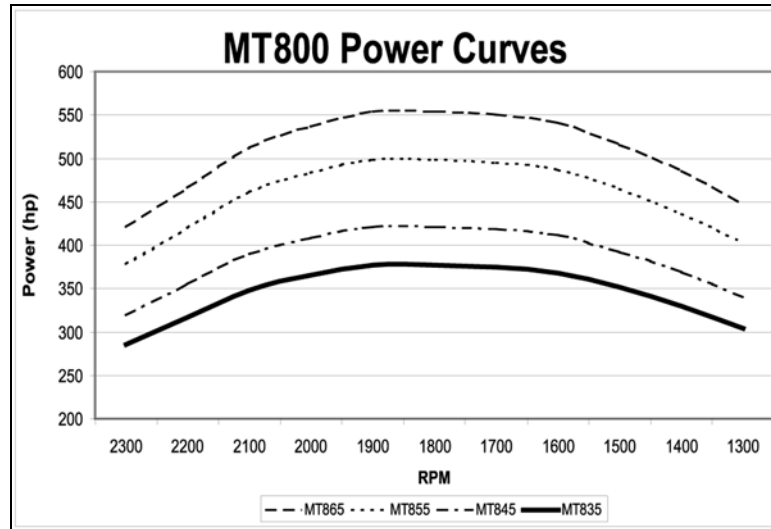
The longer wheelbase of Challenger MT800 Series tractors improves the contact area by 10.4 percent over the Challenger 65E-95E, with a wheelbase of 107.1" (2720 mm). This improvement adds to better flotation and reduced compaction with the same size belt as the Challenger 65E-95E.

Ground Pressure							
Belt Width		Contact Area		38,000 lbs weight		50,000 max. op. weight	
In	mm	sq in	sq m	psi	kPa	psi	kPa
18	457	4252	2.74	8.9	61.6	11.8	81.1
27.5	699	6496	4.19	5.9	40.3	7.7	53
30	762	7086	4.57	5.4	37	7.1	48.7
36	914	8503	5.49	4.5	30.8	5.9	40.5

Belt Area Comparison Between MT800 Series And The Challenger 65E-95E				
E-Series Belt	E-Series area	MT800 area	MT800 Belt	MT800 % area vs. E-Series
		4252 in ²	18" (457 mm)	
25" (635 mm)	5355 in ²			
27.5" (699 mm)	5891 in ²	6496	27.5" (699 mm)	10.3%
30" (813 mm)	6426 in ²	7086	30" (813 mm)	10.3%
35" (899 mm)	7497 in ²	8503 in ²	36" (899 mm)	13.4%

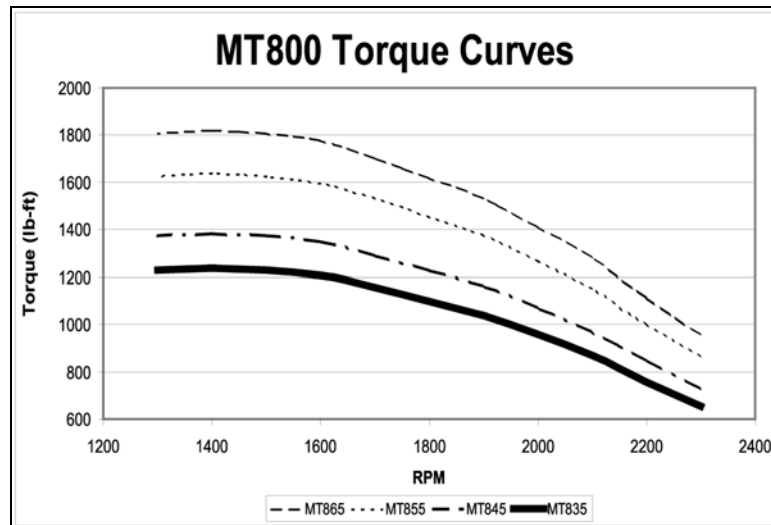
5. Engine

Challenger MT835 and MT845 Series tractors are powered by the Caterpillar C12 Engine with OECD² gross horsepower ratings from 340 HP (254 kW) on the Challenger MT835 and 380 HP (283 kW) on the Challenger MT845. The Challenger MT855 is powered by the Caterpillar C15 engine and has a gross horsepower rating of 450 HP (336 kW). The Challenger MT865 is powered by the Caterpillar C16 engine and has a gross horsepower rating of 500 HP (433 kW). All of the engines use mechanically actuated, Electronically-controlled Unit Injectors (EUI) and air-to-air aftercooling (ATAAC).



MT800 Power Curves

Figure 63



MT800 Torque Curves

Figure 64

² Organization for Economic Cooperation and Development

5.1. C12 Engine Components

C12 Engine

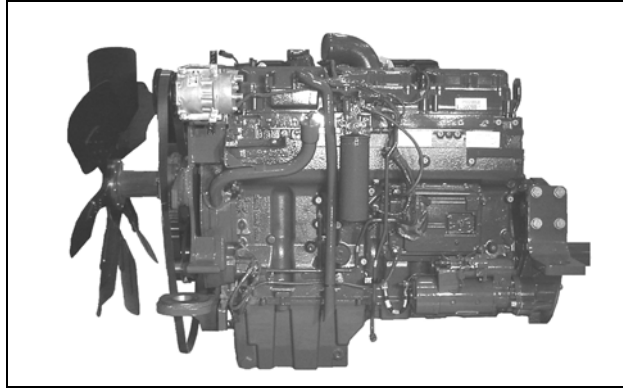


Figure 65

5.1.1. Engine Block

The cylinder block is a heavy-duty serpentine design with a tensile strength of 32,000 psi (220,480 kPa). The block features fewer sealing joints for better reliability and large oil and coolant passages. An integral oil cooler reduces the width of the engine envelope and eliminates external oil lines. A stronger block-to-flywheel housing joint is part of the design to handle the high power requirements.

5.1.2. Cylinder Liner

A wet, high strength gray iron cylinder liner is a key component of this new engine platform. The liner has a hardened, plateau-honed surface, and a mid-supported design for more robust head/block sealing. The mid-support feature allows a higher top ring position, which improves fuel consumption and emissions.

This design offers excellent rebuildability at overhaul time.

5.1.3. Cylinder Head

The cylinder head is a four-valve, uni-flow design for better airflow and more efficient coolant flow, which results in better fuel consumption and emissions. The head design allows for use of a centered, vertical injector for improved fuel spray patterns — a significant factor in lowering exhaust emissions. A six-bolt-per-cylinder design provides better sealing and minimizes bore/liner distortion.

5.1.4. Crankshaft

*Regrindable
Crankshaft*



Figure 66

The crankshaft features a Caterpillar exclusive totally hardened process. It is regrindable at overhaul time.

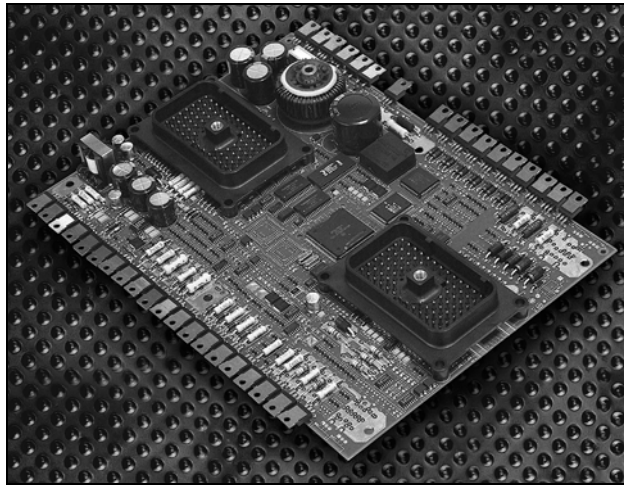
5.1.5. Connecting Rod and Piston Assembly

The connecting rods are forged steel castings for strength and durability. The pistons are a two-piece design: steel crown for strength and aluminum skirt for lower weight.

5.1.6. Fuel System

The C12 engines use the proven mechanically actuated, electronically controlled unit injector fuel system.

5.1.7. ADEM III Electronics



*New ADEM III
Control Module
Controls Engine*

Figure 67

The C12 engine is controlled by the ADEM III electronics. Key features of ADEM III include:

- Passive temperature sensors and dual speed timing for increased system reliability
- ECM capability — increased processing speed and memory (flash, RAM)
- Fuel cooled ECM for durability

5.2. C15/C16 Engine Components

C16 Engine

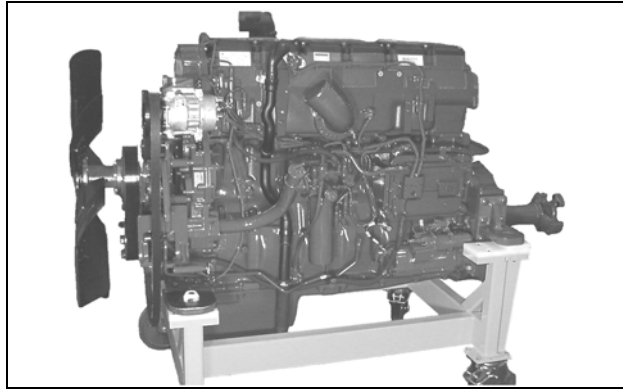


Figure 68

5.2.1. Engine Block

*Heavy-Duty
C15/C16
Block*



Figure 69

The cylinder block is a heavy-duty serpentine design with a tensile strength of 36,984 psi (255 000 kPa). The block features fewer sealing joints for better reliability and large oil and coolant passages. An integral-oil cooler reduces the width of the engine envelope and eliminates external oil lines. A stronger block-to-flywheel housing joint is part of the design to handle the high power requirements.

5.2.2. Cylinder Liner

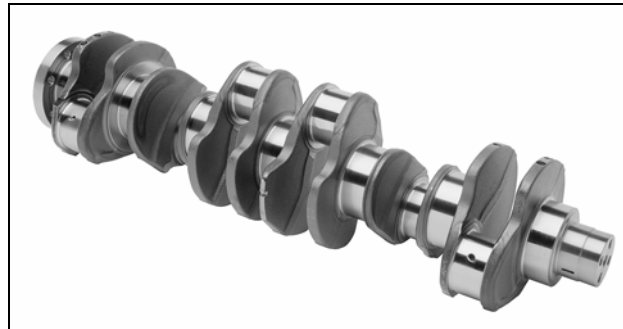
A wet, high strength gray iron cylinder liner is a key component of this new engine platform. The liner has a hardened, plateau-honed surface, and a mid-supported design for more robust head/block sealing. The mid-support feature allows a higher top ring position, which improves fuel consumption and emissions.

This design offers excellent rebuildability at overhaul time.

5.2.3. Cylinder Head

The cylinder head is a four-valve, cross-flow design for excellent breathing capability, which results in better fuel consumption and emissions. The head design allows for use of a centered, vertical injector for improved fuel spray patterns — a significant factor in lowering exhaust emissions. A six-bolt-per-cylinder design provides better sealing and minimizes bore/liner distortion.

5.2.4. Crankshaft



*Regrindable
Crankshaft*

Figure 70

The crankshaft features a Caterpillar exclusive totally hardened process. It is regrindable at overhaul time.

5.2.5. Connecting Rod and Piston Assembly

The connecting rods are forged steel castings for strength and durability. The pistons are a two-piece design: steel crown for strength and aluminum skirt for lower weight.

5.2.6. Fuel System

The C15/C16 engines use the proven mechanically actuated, electronically controlled fuel injection system.

5.2.7. ADEM III Electronics

*New ADEM III
Control Module
Controls Engine*

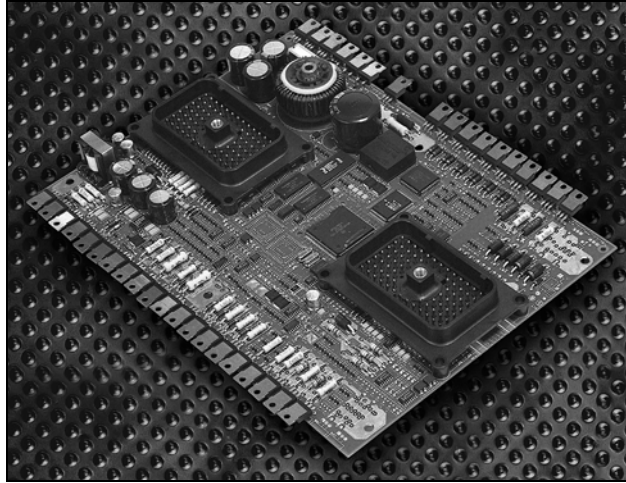


Figure 71

The C15/C16 engine is controlled by the ADEM III electronics. Key features of ADEM III include:

- Passive temperature sensors and dual speed timing for increased system reliability
- ECM capability — increased processing speed and memory (flash, RAM)
- Fuel cooled ECM for durability

5.3. Cold Starting

Ether starting aid is standard on Challenger MT800 Series tractors. When the temperature is below 32°F (0°C), the engine control will inject ether into the air intake elbow. No operator involvement is necessary. An “Ether Injection” message on the TMC display will show when the ether is in use.

A 120-volt engine block heater is standard on all MT800 tractors.

5.4. Cooling System

The radiator is factory equipped with Caterpillar Extended Life Coolant, which only requires changing after 6000 hours or 4 years with one addition of Coolant Extender at the 3000 service hour interval. The cooling system provides cooling to 118° F (48° C) and freeze protection to -33° F (-36° C) from the factory. Air is drawn across the radiator/coolers by a single suction-type fan. The large grill reduces air velocity, which reduces debris plugging.

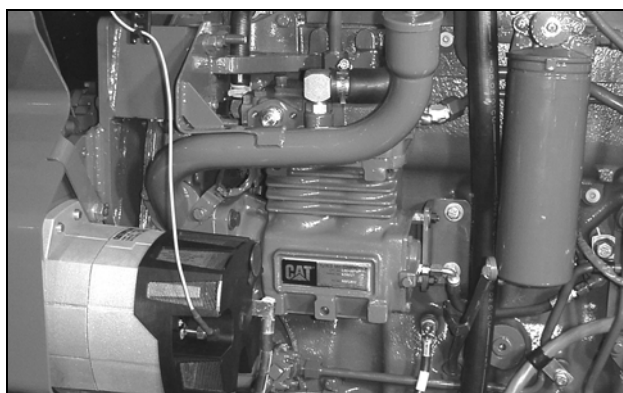


*Cooling System
provides Cooling
for Ambient
Conditions of up
118° F (48° C)*

Figure 72

The air-to-air aftercooler and air conditioner condenser swing open and a 4" (100 mm) space between the oil cooler and radiator allow easy cleaning of the cores. A coolant sampling valve is provided for detection of potential cooling system problems. The coolant overflow bottle provides quick check/fill of coolant level from the ground during a walk-around inspection.

5.5. Air Compressor



*Optional Air
Compressor*

Figure 73

An optional air compressor with a 5.3 Gal (20 L) air tank is available as a factory-installed option. When an air compressor is installed, the PTO horsepower is decreased by up to 6.3 hp (4.7 kW) during compressor loading cycles. The maximum air pressure is 116 PSI (800 kPa).

5.6. Exhaust System

*Muffler Designed
for Increased
Paint Life*



Figure 74

The muffler consists of two steel tubes separated by a .5" (12 mm) thick carbon fiber mat. The mat prevents the outer skin of the muffler from getting too hot. This increases the life of the paint on the muffler. The black exhaust tube coming from the engine and the muffler extension are coated with a special aluminum-ceramic coating and covered with high-temperature black paint for longer paint life.

6. Powertrain

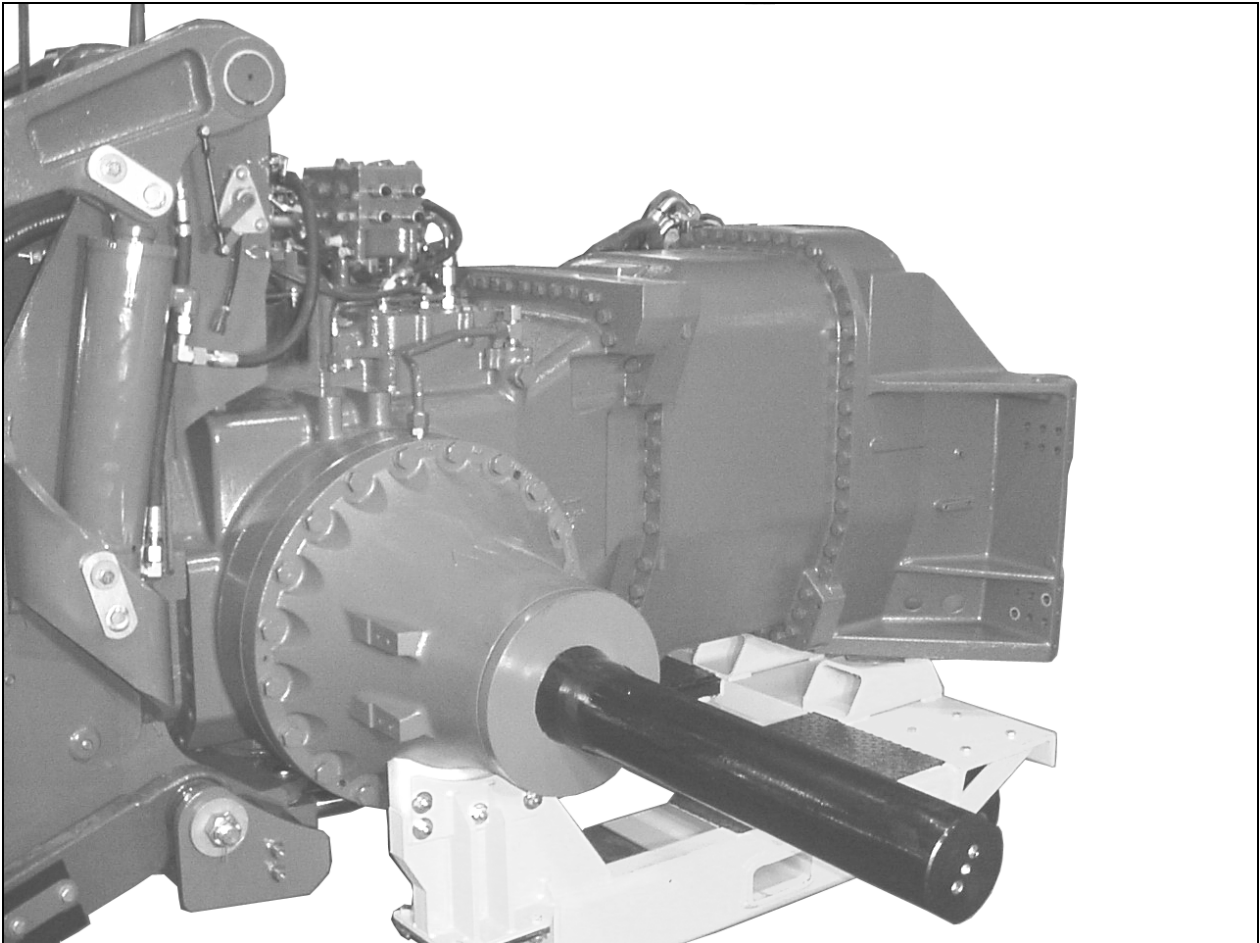


Figure 75

The Challenger MT800 Series tractors' powertrain was designed by Caterpillar from the ground up, as a track tractor powertrain ... not a converted wheel tractor powertrain. Carrying full horsepower in all gears, from the flywheel to the undercarriage, the powertrain is the backbone of the tractor. It supports the front frame rails, cab, fuel tanks, hardbar, hydraulics, 3-pt. hitch, drawbar, and chemical tanks.

The powertrain consists of the transmission, differential and service brakes, power take-off, and final drives.

A large magnet at the bottom of the powertrain will collect metal fragments that may enter into the system through the implement valves, improving powertrain life.

6.1. Transmission

The standard transmission has 16 forward and four reverse gears. The transmission is ruggedly built with high-strength cast ductile iron housings that support high-capacity bearings and shafts to provide excellent durability. All gears are high-contact ratio spur gears cut to provide a large amount of tooth contact area while minimizing noise.

The transmission has nine individual clutch packs consisting of seven rotating and two stationary clutches. Each of the 16 forward and four reverse gears is engaged when a combination of one range clutch and one speed clutch is engaged. The tractor will not "freewheel" in any gear, keeping the operator in control, even when going down a steep grade. This helps maintain a constant travel speed.

The transmission provides external drives for the implement hydraulic pump, steering oil pump and differential steer pump providing easy access for service. More information pertaining to the hydraulic pumps will be covered in the Hydraulics section.

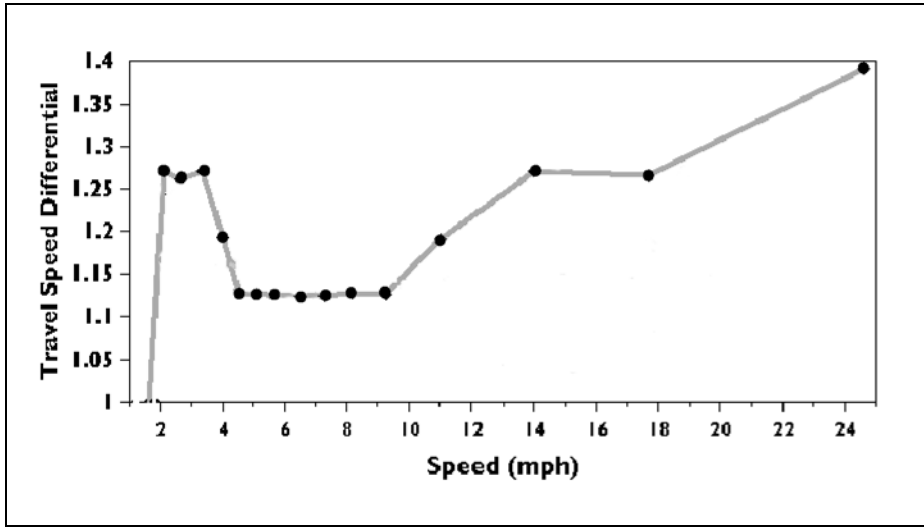


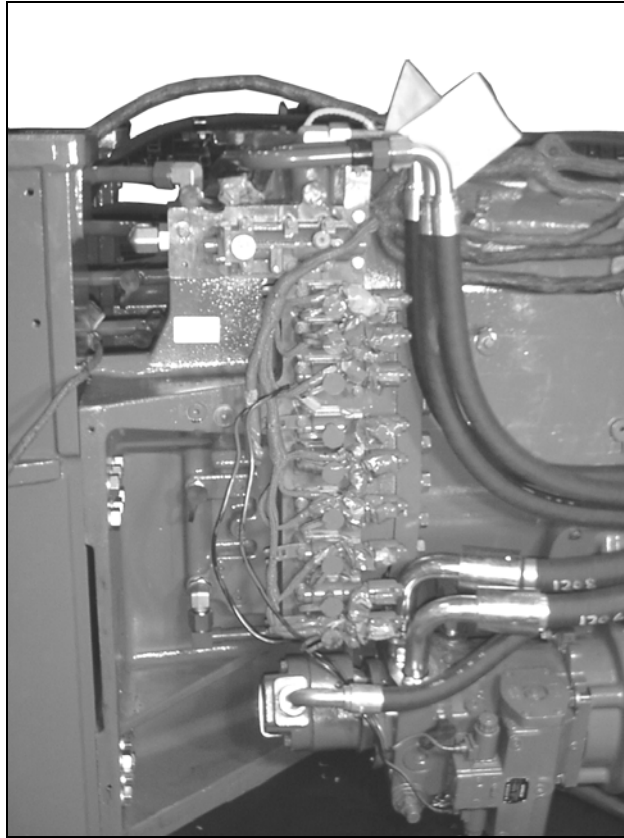
Figure 76

The transmission's speeds are spaced for engine performance curves. The speeds are carefully developed to match tillage, PTO, and transport speeds. The 16 forward and four reverse speed transmission has eight gears in the critical field working range of 4 to 9.3 mph (6.5 to 14.9 km/h).

MT800 Series Travel Speeds @ 2100 rpm		
Gear	MPH	Km/h
1F	1.7	2.7
2F	2.1	3.4
3F	2.7	4.3
4F	3.4	5.8
5F	4.0	6.5
6F	4.5	7.3
7F	5.1	8.2
8F	5.8	9.3
9F	6.5	10.4
10F	7.3	11.7
11F	8.2	13.2
12F	9.3	14.9
13F	11.0	17.7
14F	14.0	22.5
15F	17.7	28.5
16F*	24.6	39.7
1R	1.3	2.1
2R	3.2	5.2
3R	3.6	5.8
4R	8.8	14.2

* In 16F, the maximum engine speed increases to 2300 rpm.

6.1.1. Transmission Control



*Transmission
Control Valve*

Figure 77

The electronic transmission control, in communication with the engine electronic control, controls the shifting function. With the electronic controls, shift “harshness” is minimized, improving shift quality, whether cold or at operating temperature, under load or without a load. The electronic controls also make various gear shifting methods possible.

Shuttle shifting is used to quickly change the direction of the tractor without using the inching pedal or coming to a stop prior to making the shift from forward to reverse or reverse to forward.

Programmable shifting enables an operator to set the desired reverse or forward gear the tractor will shift to when shuttling from either forward to reverse or reverse to forward.

Continuous shifting provides smooth shifts in either forward or reverse when the operator holds the upshift or downshift button.

Sequential (pulse) shifting is when a single upshift or downshift is desired. When the operator pushes the button once, the tractor corresponds with a single shift.

Pre-select shifting enables the operator to select the desired start gear before the transmission is engaged. The maximum start gear is 10th, which allows for loaded starts by monitoring clutch slip and automatically downshifting if it senses too much clutch slip.

Speed matching shifts the transmission in the gear that most closely matches the ground speed. Speed matching mode is only effective when the tractor is traveling above 10 mph (16.1 km/h). To activate speed matching, the inching clutch is disengaged and then re-engaged, the tractor’s controllers evaluate the current ground speed and current engine speed, and then, select the transmission gear that most closely matches both.

6.2. Differential Steer and Brakes

6.2.1. Differential Planetaries

The speed-compensated differential steering system consists of three planetary gear sets that work as a system to “differentially” speed up or slow down one belt relative to the other. The degree and direction of speed change is relative to the degree of turn and direction of rotation of the steering wheel. The steering wheel directly affects the speed and direction of the steering motor. The maximum speed differential between the left and right belt is 6.4 mph (10.3 km/h)

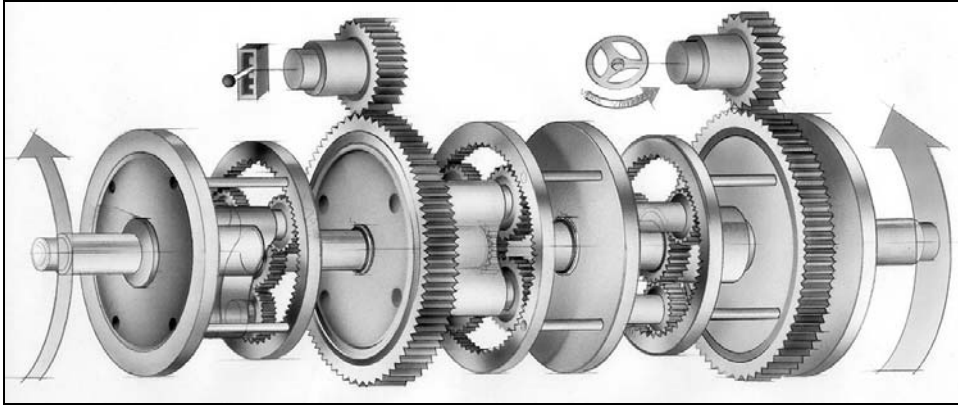


Figure 78

The differential receives input from two sources: the transmission and the steering motor. When traveling in the straight mode, all power is received from the transmission to one of three planetary gear sets. When a change of direction is desired, the steering motor provides power to the steering planetary set, which changes the power distribution.

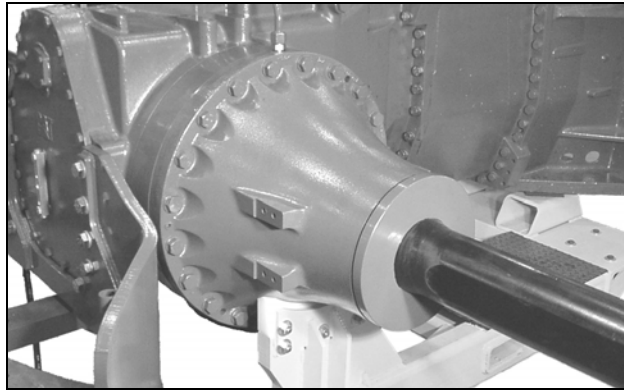
The differential on the Challenger MT800 Series tractors is similar to the differential on previous Challenger tractors. The two major differences are that the steering motor lies on its side and transmits power into the differential with a spur gear rather than a bevel gear. The differential steering system is electronic over hydraulic system, which enables a varying steering ratio based on the tractor's ground speed. The steering system has three levels of checks for triple redundancy to ensure accurate steering.

6.2.2. Brakes

The tractor uses oil-cooled, multi-disc service brakes. One service brake is located on each side of the tractor. The brake pedal actuates both service brakes. The service brakes are hydraulically power assisted and self-adjusting. The hydraulic assist only functions when the engine is running. When the engine is off, the brakes will still function; however, more pedal effort is required. The brakes use a self-adjusting retraction mechanism that adjusts the brake piston's position as it wears to maintain constant piston travel. This provides sufficient brake pack clearances to reduce power-robbing viscous drag when the brakes are disengaged and keeps the brake actuation time and feel constant as the brakes wear.

The parking brake is also an oil-cooled, multi-disc brake and is located on the transmission input to the differential. The parking brake is spring-applied and hydraulically released. If the engine stalls and no hydraulic pressure is available to release the parking brake, the parking brake can be overridden in order to tow the tractor by pressurizing the brakes with a built-in hand pump located on the inner frame.

6.3. Final Drives

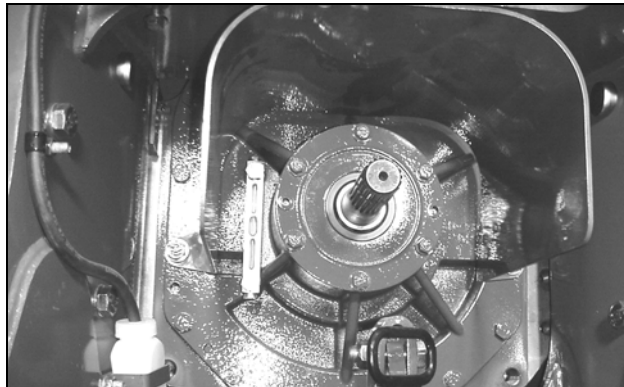


Rugged Final Drives

Figure 79

The final drives are single reduction planetary type. The axle housings are constructed of ductile iron. They provide mounting locations for the final drive planet carrier and the axle. The axle shafts run on large tapered roller bearings for low maintenance and long life. These bearings are lubricated by the differential oil thus eliminating service checks and greasing.

6.4. Power Take-off (PTO) (Optional)



Optional 1000 rpm Power Take-Off

Figure 80

Challenger MT800 Series tractors are optionally equipped with an electronically modulated 1000 rpm power take-off (PTO). The shaft is a 1.75" (45 mm) 20-spline ASAE Type-3 shaft with shield and shaft cover.

The PTO is an option on the Challenger MT800 Series tractors. It is heavily constructed with durable components meant to handle high torque equipment such as grain carts, forage harvesters, manure injectors, water sprayers, etc. To activate the PTO, lift up on the yellow knob located on the TMC. Push down the yellow knob to disengage the PTO. The PTO clutch is electronically activated with automatic torque modulation.

A PTO brake prevents unintentional PTO rotation when the engine is running and the PTO is not engaged. The brake is spring-applied and hydraulically released. An operator presence alarm will alert the operator if the seat is vacated while the PTO is engaged.

7. Hydraulics

*Optional 59 GPM
(233 LPM)
Hydraulic Pump*

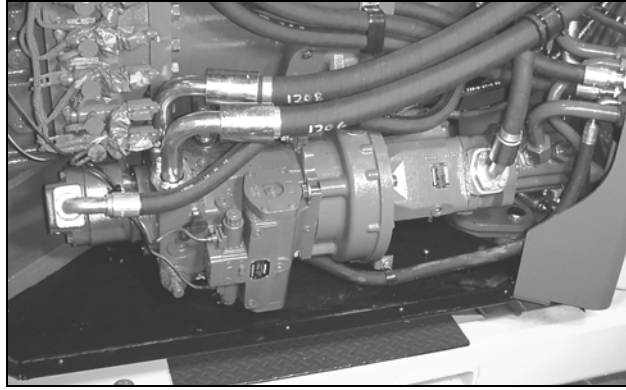


Figure 81

The hydraulic system on the Challenger MT800 Series tractors uses a common sump. One common sump provides lubrication for the PTO, transmission, brakes and differential; supplies pilot control oil for steering, transmission, and PTO; and provides system oil for the implement and steering hydraulic systems. The hydraulic system uses a scavenge pump to improve transmission efficiencies by allowing lower oil levels, thus keeping the output shaft clutches and gears from dipping in oil. This lowers parasitics, reduces the sump volume for lower owning and operating costs, and increases the slope capability.

*Common Sump
Within Powertrain
Case*

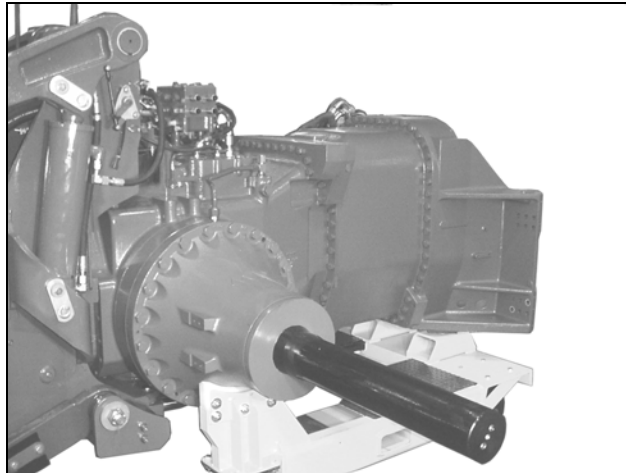


Figure 82

The sump is located within the powertrain case of the tractor and has 63.5 gallon (182 liter) refill capacity.

There is a split core oil cooler located at the front of tractor. The oil cooler hydraulic circuit is equipped with two bypass valves to speed oil warming during cold morning start-ups. One bypass valve is located in the transmission while the second bypass valve is located in the lube lines.

Oil is drawn from the sump through a 200-micron screen by a two-section gear pump. Section one of the gear pump supplies oil at 38.5 GPM (145 LPM) through a 5-micron absolute filter to the following controls: transmission, PTO, parking brake, and steering control. Section one of the gear pump also supplies oil to transmission lube, parking brake lube, and the transmission oil cooler. The 5-micron absolute filter is equipped with a bypass indicator. The electronic bypass indicator will inform the operator through the TMC display that oil is bypassing the filter. This feature allows the operator to monitor the system, which can help protect the transmission hydraulic system from possible damage. The second section of the gear pump acts as a charge pump for the implement pump and a source for lube oil for the differential, PTO, and creeper transmission.

Caterpillar manufactured hoses and tubes are used wherever possible to ensure product reliability for thousands of hours of operation. Previous Challenger tractors used 50-75% Cat lines and hoses. One hundred percent of the high-pressure hoses used on Challenger MT800 Series tractors are made by Caterpillar.

7.1. Implement Hydraulic System

A 43.5 GPM (166 LPM) implement hydraulic pump is used for quick response to changing hydraulic needs. An optional 59 GPM (223 LPM) pump is available. A 5-micron absolute filter with bypass indication protects the pump. The electronic bypass indicator will inform the operator through the TMC display that oil is bypassing the filter. This feature allows the operator to monitor the system, which can help protect the implement system from possible damage.

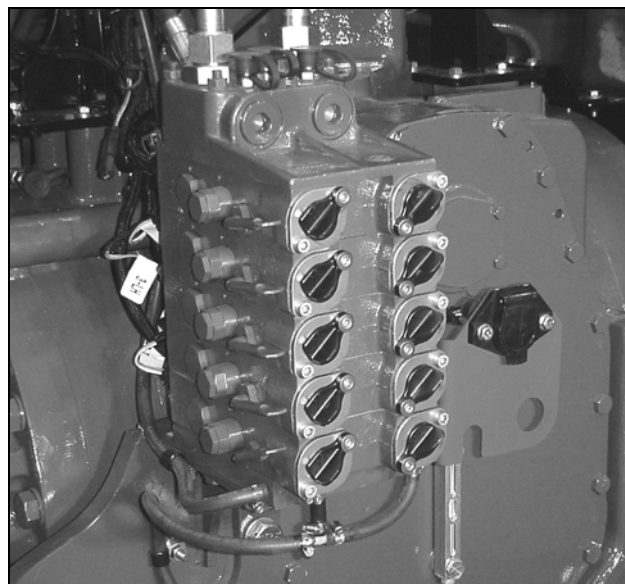
The hydraulic pump is a variable displacement, load-sensing pressure compensated pump. The pump only works when implement functions are commanded. Therefore, when hydraulic flow demand is reduced, the pump destrokes and reduces flow. This conserves power that can be used at the drawbar or PTO.

A hydraulic oil cooler is standard equipment on the Challenger MT800 Series tractors. The cooler prevents hydraulic oil overheating in extreme applications or ambient conditions. The system is equipped with a cooler bypass that allows cold oil to bypass the cooling circuit.

The electrohydraulic implement system electronically controls the hydraulic flow to implements attached to the tractor. This eliminates the mechanical cable assemblies on previous Challenger tractors, which were required to control hydraulic valves. The electronic control enables the operator to control the hydraulic flow to implements more accurately, provides a means to make implement control programmable, and allows for more ergonomically designed armrest mounted controls.

The electronic control can be adjusted slowly by turning the knob on the TMC display by one click at a time. This will increase or decrease the flow rate by approximately 1 pint (.47 L) per click of the knob when the knob is turned slowly. If an increased rate of flow is desired, the knob can be turned quickly, which will increase the flow at a higher rate. The change in flow rate increases as the speed at which the knob turns is increased.

All circuits have flow control capability from 1-30 GPM (3.8-113.5 LPM). This allows implement hydraulic response rates to be controlled with more flexibility. Load Independent Flow Division (LIFD) ensures proportional oil flow to all circuits when the system is operating at maximum capacity.



*Up to Six
Hydraulic Valves
are Available*

Figure 83

Four remote hydraulic valves are standard. Up to six valves are available, with the sixth valve being a dealer-installed attachment. All remote hydraulic valves have pilot-operated load check valves installed in both ports to

prevent implement creep due to spool leakage. In addition, if the tractor is equipped with a 3-pt. hitch, there is an electronically controlled 3-pt. hitch valve.

The standard ISO couplers can be connected and disconnected while under pressure with the lever release coupler. Location of the valves and couplers make them very accessible for hooking and unhooking the couplers, which are integral to the valve stack.

*Kits are Available
for Hydraulic
Power-Beyond
and Motor Case
Drain
Connections*

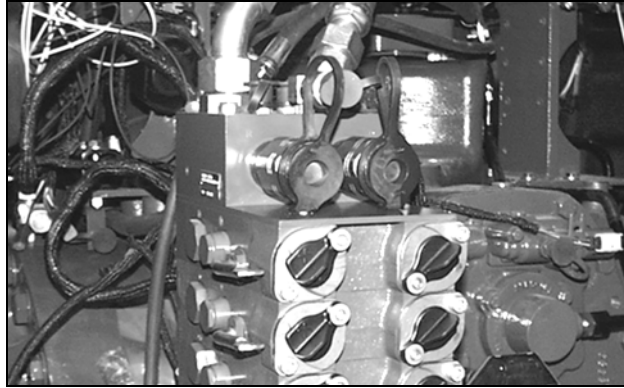


Figure 84

Hydraulic power-beyond with load sensing can easily be installed for those motors or implements demanding additional amounts of flow. Kits are available for 1/2" and 3/4" couplers. The 1/2" kit is recommended for applications with flow requirements of 15 GPM (56.8 LPM) or less. The 3/4" kit is recommended for applications with flow requirements that are greater than 15 GPM (56.8 LPM).

An optional implement motor case drain connection can be installed for implements with orbital motors. The motor case drain connection filters the case drain oil as it re-enters the tractor. The motor case drain connection can handle flow up to 1.5 GPM (5.7 LPM).

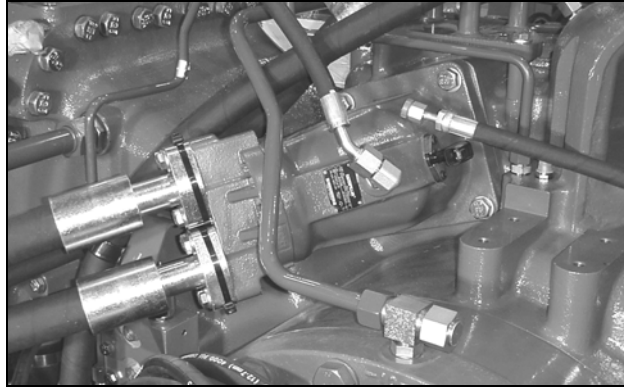
7.2. Steering System

Differential steering was pioneered and fine-tuned by Caterpillar. It allows power distribution to be changed within the differential. This system never disrupts power; it simply alters the way it is distributed, unlike a clutch and brake steering system used on traditional tracked tractors. The tractor is steered when power distribution change causes one track to speed up and the other to slow down by the same amount. It is an extremely efficient and reliable way to steer a rubber-belted ag tractor.

The large section of a two-section gear pump, which draws oil directly from the sump, charges the steering pump. This provides excellent steering pump response and protects the pump from cavitation.

The steering pump is a heavy-duty 7.6 in³ (125cc) variable displacement, over-center, bi-directional piston pump. The pump only operates when an electrical signal is received from the steering control sensor via the Tractor Management Network. The steering wheel can turn 170 degrees in either direction with an automatic spring return to center. This provides almost one full rotation of the steering wheel from a full left to a full right turn or vice-versa. The spring return to center provides the operator easy operation.

A 5-micron absolute filter with electronic bypass indication protects the steering pump. If this filter should go into bypass mode during normal machine operation, the operator will be informed through the TMC display and an audible alarm will sound. This feature helps protect the vital components of the machine steering system.



Steering Motor

Figure 85

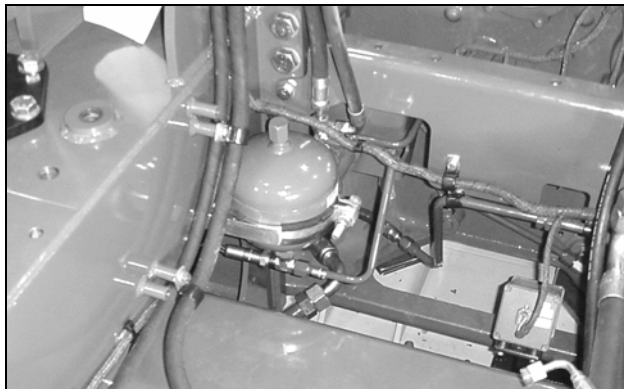
The MT800 Series tractors are equipped with a heavy-duty 6.53 in³ (107 cc) steering motor. The motor is a bent-axis piston, fixed-displacement, bi-directional motor and is located in a horizontal position on top of the center housing. The direction of rotation of this motor determines the direction of turn of the tractor, and the rate of turn determines the amount of speed differential between the belts.

The steering radius on the Challenger MT800 Series tractors is infinitely small. The tractor can actually turn within its own length (spot turn capability) when the transmission is in NEUTRAL. This provides maximum flexibility especially when performing row-crop work with fully-mounted equipment. When the tractor is in PARK, the tractor's steering system is deactivated. The system allows movement in NEUTRAL for ease of hooking up implements.

The electrohydraulic steering system is standard on Challenger MT800 Series tractors. A key benefit of this type of steering system is the added flexibility and comfort that it provides. It enables the operator to control the steering with less effort, provide a means to make steering control programmable, and allow for varied operator controls not possible from a mechanical steering system. The electrohydraulic system also allows for an easily adaptable auto-guidance system. The steering system is designed to rigid Caterpillar electronic standards. The steering sensor system has triple-redundancy, which means that the system can have a partial failure and still operate normally with the Tractor Management Center, notifying the operator of the failure allowing the failure to be resolved without hindering risk to the tractor operator.

7.3. Braking System

Like the E-Series Challenger tractors, the Challenger MT800 Series tractors feature a full hydraulic brake control system, which improves braking performance while reducing operator pedal effort. The system uses implement hydraulic oil to actuate the brakes, eliminating the need for brake fluid or other fluids, which require servicing. The implement hydraulic oil charges an accumulator, which stores pressurized oil. The pressurized oil is modulated to the brake pack via a brake control valve. The right foot pedal in the cab controls the brake control valve.



*Brake System
Accumulator*

Figure 86

The implement hydraulic system recharges the 122 in³ (2 L) accumulator. When the accumulator is not being charged, hydraulic oil flows freely through the brake priority valve to supply the implements. Once the accumulator pressure drops below a set pressure, the brake valve diverts implement hydraulic oil to charge the accumulator. When the accumulator is fully recharged, implement oil is free to flow to the remote hydraulic valves. Oil flow to the brake accumulator has priority over oil flow to any implement demand ensuring braking needs are met. Due to the low flow and short recharge time required by the brake accumulator, implement performance is not noticeably affected.

Pedal efforts are minimized with this new hydraulic braking system. Brake line pressure is not generated by pedal force, but rather by stored energy in the accumulator. The Challenger MT800 Series tractors' pedal effort is approximately 100 lb (45 kg). Pedal effort and maximum brake line pressure are consistent for both "live" engine and "dead" engine condition braking needs. Braking performance does not deteriorate if the tractor experiences an engine failure or is shutdown. A minimum of six full braking applications without the engine running provides braking for the Challenger MT800 Series tractors. This exceeds the SAE requirements.

An audible alarm and dash panel-mounted light warns the operator that the accumulator pressure is low or is not functioning properly. The low pressure warning alarm is activated when the accumulator pressure drops below set pressure.

8. Hitch

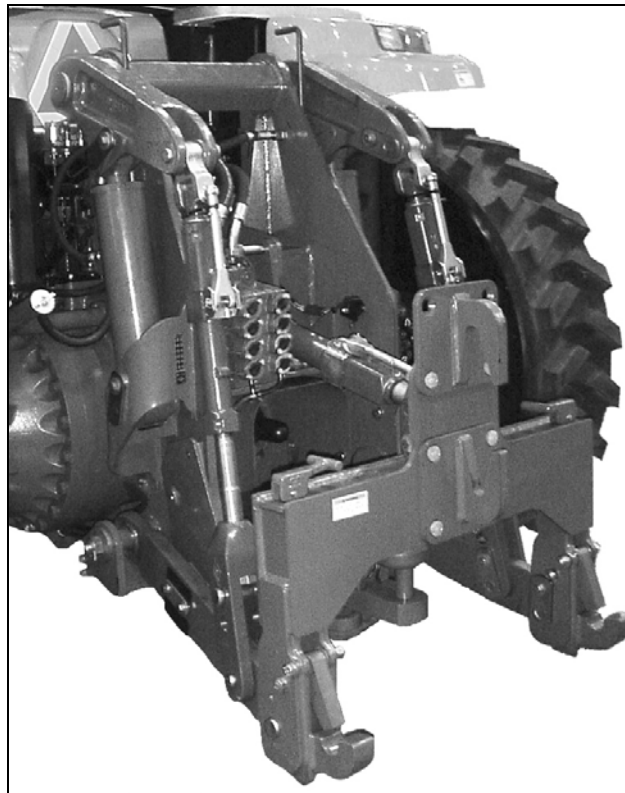
8.1. Steerable 3-Pt. Hitch (Optional)

The MT800 tractors have excellent tractor balance due to a combination of hitch geometry, center of gravity of the tractor, and longer wheelbase. This combination improves overall tractor balance and allows the tractor to carry a load with better stability.

The optional hitch configuration for the MT800 tractors is a steerable 19,500 lbs (8845 kg) hitch with a free-swinging drawbar. The 3-pt. hitch is not compatible with the wide-swinging drawbar.

The optional 3-pt. hitch provides position control, transport dampening system, draft control, slip control (with optional radar), and integration with One-Touch and power management. The 3-pt. hitch lift capacity exceeds the competition with 19,500 lb (8845 kg) lift in more configurations with better mast angle adjustability than the track competition. The 3-pt. hitch includes a quick hitch.

Minimum lift height for 3-pt. hitch at the quick hitch is 6.94" (176.2 mm) with a maximum lift height of 50.4" (1280 mm). Adjusting the length of the lift links will change the minimum and maximum lift height. Implement kick-up above horizontal, in most common situations, is 10 – 15 degrees for the steerable hitch. The 3-pt. hitch is equipped with steering cylinders that allow a maximum of 12 degrees sway in each direction. This allows the tractor to make in-field steering corrections more easily.



*Steerable 3-pt
Hitch Improves
Steering
Performance*

Figure 87

The lift links have a built-in ratchet mechanism to simplify the adjustment of the draft arms. The lift cylinders are designed with low pressure oil on the seals to ensure seal lubrication and improved seal life.

The hitch controller controls the movement and positioning of the vertical component of the rear hitch in response to draft, slip, and position control. The hitch controller uses information provided via the data link to receive information such as transmission direction selected, engine speed, and graphics display parameters. The 3-pt. hitch is raised and lowered by a hitch position lever located on the TMC. A raise/work switch that is located on the TMC

can also control the hitch. The raise/work allows the operator to quickly raise the hitch to a predetermined maximum height, as well as quickly lower the hitch back to the position indicated by the hitch position lever.

The tractor may pull harder or run easier, depending upon soil conditions. Draft Control automatically adjusts the implement's working depth as soil conditions vary, maintaining an even pull on the tractor and compensating for changes in terrain. Tractors equipped with draft control use a combination of electronic controls to provide a very precise draft control system that is easy to operate.

The position control lever, located on the TMC, is used to set the normal working depth of the implement. The position control lever can be used to raise and lower the hitch for simple operation. With the tractive advantage of the Challenger MT800 Series tractors, position control is the recommended mode of operation to maintain consistent implement depth.

*Fender-Mounted
Raise/Lower
Switch Makes
Implement Hook-
Up Easy*



Figure 88

The external raise/lower switch, located at the left rear fender aids in hooking up and detaching implements with only one person, thus reducing the need for multiple trips in and out of the cab. The external raise/lower switch, also allows lowering of the implement from ground level.

Slip control automatically adjusts the implement's working depth as soil conditions vary and track slip exceeds the specified amount set by the operator in the TMC display. There is not a separate switch to enable or disable slip control. For no slip control, the sensitivity setting is "0". If draft control and slip control are both enabled, priority is given to the control that raises the hitch the highest. If the slip control raises the hitch and the tractor is then stopped, the hitch drops back to the control lever position. Power Management and One-Touch both include the hitch control in their operations.

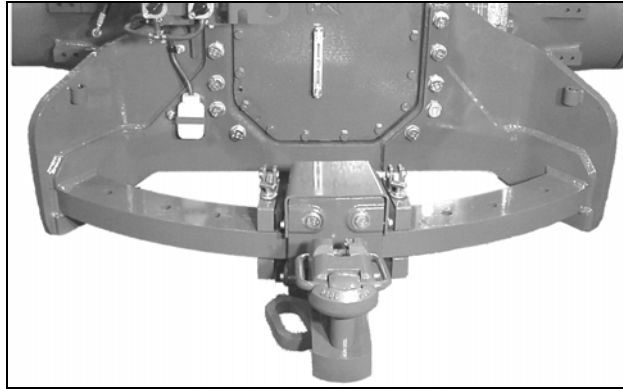
The quick hitch, built for tracks, lifts and handles the loads tracked tractors generate. The quick hitch handles Category III or IVN implements. The quick hitch easily converts from one category to another.

The steerable 3-pt. hitch improves tractor steering control and improves row corrections. The steerable hitch has a range of ± 12 degrees swing. The steerable hitch has three settings: AUTOSTEER, MANUAL, and FLOAT.

The optional steerable 3-pt. hitch offers optimal performance benefits for the tractor. The value of the steerable 3-pt. hitch is reduced as the gauge widens.

The 3-pt. hitch was designed to optimize the overall track tractor design/chassis itself. The design provides optimal balance, the best of any track tractor, resulting in excellent field and transport performance.

8.2. Drawbar



*Wide-Swinging
Drawbar*

Figure 89

There are three drawbar options available for the Challenger MT800 Series tractors. The standard tractor is equipped with the wide-swinging roller drawbar. Tractors equipped with the optional 3-pt. hitch are equipped with a free-swinging drawbar. Also available, is the optional controlled drawbar which uses hydraulic cylinders to control the position of drawbar. The standard wide-swinging roller drawbar and the optional controlled drawbar are not compatible with the 3-pt. hitch but are compatible with the PTO.

All of the drawbars have a fixed length, from the PTO of 19.7" (500 mm). Ground clearance under the drawbar for the hitch drawbar and the wide-swinging roller drawbar is 16.7" (425 mm). Ground clearance for the controlled drawbar is 13.8" (351 mm).

Full swing of the hitch drawbar when unpinned is ± 16 degrees from the tractor's centerline. The drawbar can be pinned in the center and to the far left and right positions. Controlled float of ± 12 degrees can be achieved by pinning the drawbar in place and allowing the hitch to swing. Additional swing can be achieved by unpinning the drawbar and allowing the hitch to float. This yields ± 28 degrees of swing. At narrower track gauges, controlled float is limited to prevent the quick hitch from contacting the belts.

The wide-swinging roller drawbar has ± 32 degrees of swing. The drawbar can be locked in the center or in one of several positions to the left and right. The wide-swinging drawbar is not compatible with the 3-pt. hitch.

Rubber bumpers are standard with the drawbar support to absorb shock loads and minimize the banging experienced with an unpinned drawbar without rubber pads. Wear plates are added for improved serviceability and life to the overall drawbar support. The wide-swinging roller drawbar uses a single wear plate across the drawbar support. The free-swinging drawbar used with the 3-pt. hitch uses multiple wear plates. The wear plates have been designed for simple removal and installation.

*Controlled
Drawbar Cylinder*

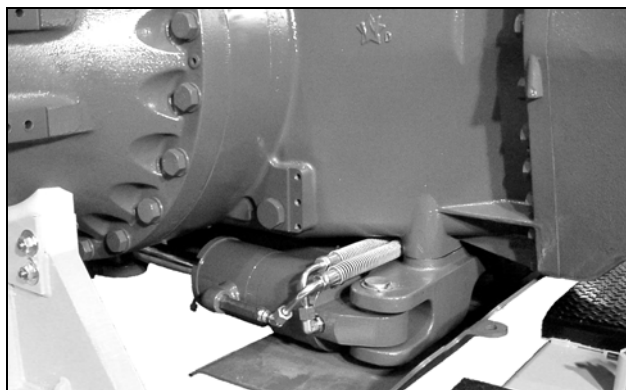


Figure 90

The controlled drawbar uses hydraulic cylinders controlled by one of the implement hydraulic valves to control the position of the drawbar. The drawbar can be locked to one side to compensate for an offset load, or allowed to float, by putting the hydraulic control lever in the FLOAT position, to "cushion" the swing.

*Triggered
Drawbar Pin
Makes Implement
Hook-up Easy*

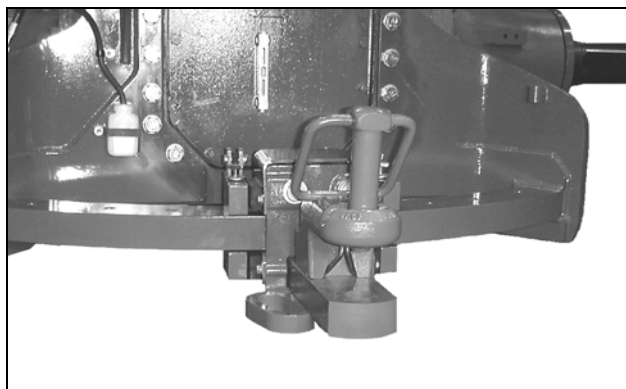


Figure 91

A trigger pin is standard, making one-person implement hook up simple and convenient. The drawbar's low profile hammerstrap allows for excellent PTO shaft clearance. The height of the drawbar on concrete is 19.1" (485 mm).

The drawbars are built for high vertical drawbar loads with a load carrying ability of 10,000 lbs (4536 kg).

To increase the life of the drawbar pin, rotate the pin by 180° each time an implement is hooked up. This allows the pin to be worn evenly on both sides.

9. Structure

9.1. Wiring Harnesses

Challenger tractors use a minimum number of connectors, resulting in fewer potential problem areas. The wiring is 18 gauge and larger. Each wire is coded for easier servicing. When a repair is required, a technician is able to move quickly to trace and resolve a wiring problem. Laser codes are used on all wires every two inches, which keeps the codes from wearing off. With the wire codes visible, future service time will be reduced — saving money and time for the customer.

All critical electrical connections are sealed. Sealing each connection prevents corrosion, which prevents long-term wire failures. Wire braiding is used on the exterior harnesses. Because of the tightness of the braiding, wires do not rub on one another, which helps ensure a reliable and durable wiring system.

9.2. Hood



*Hood Tilts
Upward for Easy-
Access to Engine*

Figure 92

The tilt-up hood is hinged at the rear and held down by two convenient hold latches. The tilting hood on the Challenger MT800 Series tractors tilts up to provide excellent serviceability to the radiator and other key service points. Most daily service points are easily reached with ground level access. The hood has two air outlets on the sides of the hood, one per side. These air outlets direct the air from the ground, away from the crop, minimizing crop disturbance. Air intakes, one on the top of the hood and the other the front grill area, provide exceptional airflow to the radiator.

The hood width is narrow at the cab end, only 30.7" (780 mm), to provide superior visibility. The short length of the hood in combination with the aggressive slope of the hood improves visibility where the operator spends the majority of the time looking.

The placement of the work and roading lights was designed to provide maximum lighting and minimal glare back to the operator.

*Access to Washer
Bottle and
Radiator
Reservoir Tank*



Figure 93

The hood transition piece has a cover that can be raised to provide convenient access to the washer bottle and radiator reservoir tank. When refilling is complete, the cover easily closes to conceal these items from both the operator's view and the spectators view, completing the automotive finish that customers desire.

*Batteries can be
Accessed by
Raising the Hood*



Figure 94

The batteries are easily accessible by simply raising the hood. The Challenger MT835 and MT845 use three maintenance-free batteries. The Challenger MT855 and MT865 are equipped with four batteries.

9.3. Fenders

The fenders accomplish several purposes. They serve as a debris shield, compliment the tractor's styling, and integrate rear taillights and work lights out of the operator's view. If equipped with the optional 3-pt. hitch, the external 3-pt. hitch switch is also incorporated for easy access into the left fender. Between the two fenders, under the cab, the slow moving vehicle (SMV) sign is positioned for clear view of approaching vehicles but completely hidden from the operator view.

9.4. Frame

The front frame has mounting locations for front-mounted chemical tanks and built-in mounting points for a light-duty dozer blade.

9.4.1. Steps



*Convenient
Toolboxes
Integrated into
Steps*

Figure 95

Two toolboxes are built into the steps. The dimensions of the toolboxes make them capable of carrying tools over 24" (610 mm) long with a total carrying capacity of 150 lbs (68 kg).

An optional inboard handrail is available.

9.5. Paint

Paint for the Challenger MT800 Series tractors exceeds all competitors in the market place. All iron that is painted gray goes through an e-coat primer process and a sprayed application of paint. The paint is electrically applied to the part, producing a run-free, sag-free, drip-free and consistent coating. The e-coat process allows paint to get into all the hard-to-reach joints and crevices inside and out, preventing rust when exposed to inclement weather. Each part is individually painted prior to assembly to ensure "rust free" joints. The components are E-coated to provide extraordinary rust and wear protection. E-coat is a better, tougher process than typical painting systems.

The black iron of the tractor interfaces with the harsh conditions more than the gray painted parts of the tractor. For that reason the black undergoes two-step e-coat painting. Not only is the iron primed in an e-coat process, the topcoat is applied using the e-coat process. The double e-coat is virtually unheard of in the ag industry. The double e-coat makes for the toughest most durable paint protecting the iron for thousands of hours of operation and years of harsh weather.

To maximize the life of the Mobil-trac System's wheels, idler, midwheels, and drivers are primed with an auto-feretic paint and then top coated with spray. The life of these rubberized components can be maximized with this process while ensuring excellent paint quality.

The final finish on the Challenger MT800 Series tractors is similar to the finish found on most automobiles. In order to maximize the appearance of the tractor, the operator should wash the tractor with the same products and practices as would be used on an automobile.

9.6. Fuel Tank

*Rear Fuel
Tanks*



Figure 96

The standard configurations of the Challenger MT835, MT845, and MT855 include two rear fuel tanks with a combined capacity of 305 U.S. gal (1159 L) capacity. An optional 25 U.S. Gal (95 L) tank can be installed in front of the transmission for a total capacity of 330 U.S. Gal (1254 L). The Challenger MT865 comes with all three tanks installed as standard equipment.

A sight gauge is incorporated into the right fuel tank so that the operator can be at ground level and still view how full the tank is during fueling while servicing the implement

The following chart illustrates the expected hours of operations between fuel fills. This data is based on an average engine load of 80%.

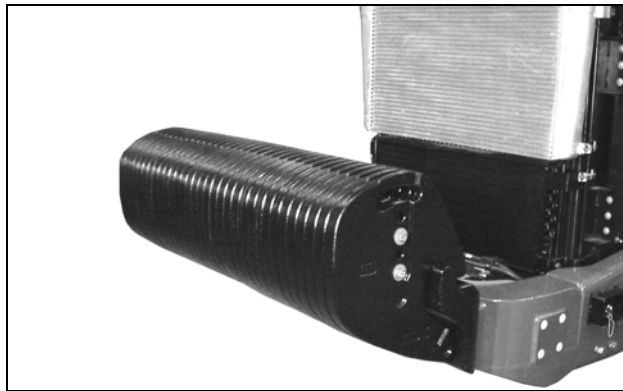
Hours of Operation							
MT835		MT845		MT855		MT865	
Std.	Opt.	Std.	Opt.	Std.	Opt.	Std.	Opt.
24.8	26.8	22.1	24	17.2	18.6	16.2	

9.7. Counterweight / Ballast

Counterweight and ballast for the Challenger MT800 Series tractors is usually necessary for row-crop and tillage applications. Front and idler weight options are available to ensure that the tractors are optimally balanced under various applications.

Balance in regards to tractive efficiency is equal to the previous Challenger tractors, however overall tractive efficiency is higher due to 11 percent longer wheelbase. The basis for the balance goals comes from extensive field-testing and computer modeling predictions, to achieve near optimum tractive efficiency over a range of draft loads.

When carrying an implement in roading applications, the MT800 series has a 22-35 percent improvement in weight balance over the previous tractors when fully-equipped with front weights and idler weights. Tractor will not be light on the front and should be less prone to front tipping during high deceleration rates.

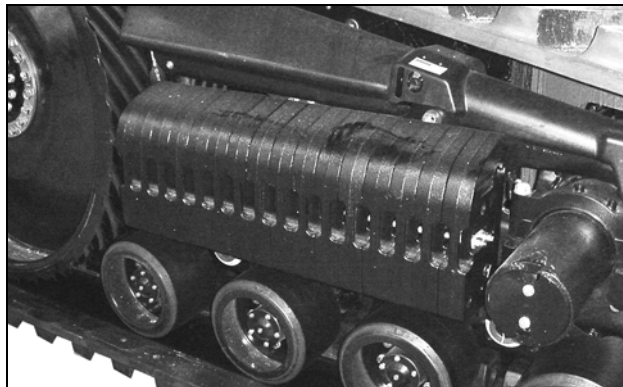


Front Weights

Figure 97

Up to 32 front weights can be added. Each weight is 102 lbs (46.3 kg).

Front Weights	Weight lb (kg)
No Front Bracket (In std tractor)	0
Front Bracket Only	1030 (467)
20 Weights	3175 (1440)
32 Weights	4294 (1948)



Undercarriage Weights

Figure 98

Up to 64 weights can be added to the undercarriage. Each weight weighs 75 lb (34 kg).

Undercarriage Weights	Weight lb (kg)
32 Weights	3175 (1440)
64 Weights	6275 (2846)

Idler Weights

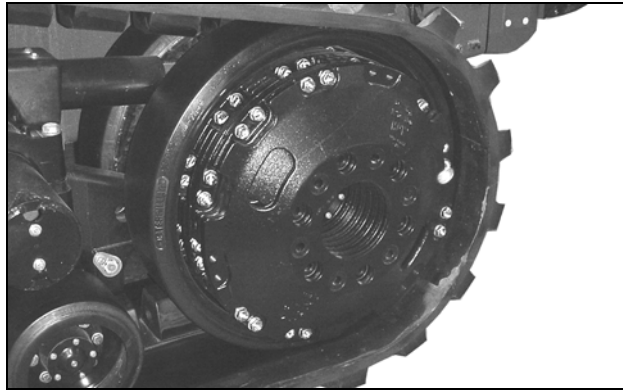


Figure 99

Idler weights can be mounted on the idlers. When maximum weight is placed on the idlers, the outside width is 28" (711 mm).

Idler Weights	Weight lb (kg)
No idler Weights (in standard tractor)	0
16 Weights	2000 (907)
28 Weights	3500 (1588)
36 Weights	4500 (2041)

10. Attachments

Options	Factory Installed	Dealer-Installed Only
Electrical System		
Battery Disconnect Switch [included in deluxe cab]	X	
ISO11783	X	
Deluxe Lights [3 exterior courtesy lights and 4 additional rear roofline lights]	X	
Nightbreaker Lights [High Intensity Discharge (HID)]	X	
Radar	X	
Reverse Alarm	X	
Rotating Beacon	X	
Extremity Lighting [included with wide-gauge tractors]	X	
Powertrain		
Power Take-off	X	
Powertrain Ecology Drain	X	X
Air Compressor	X	X
Belly Guard		X
Operator's Compartment		
Front Sun Visor [included in deluxe cab]	X	
Rear Sun Visor	X	
Accessory Bar	X	
Remote Radio Controls [requires deluxe radio]	X	
CD Changer Ready Package [wiring and hookup for CD Changer]	X	
Trailer Connector Power Switches	X	
Power Pack accessory power terminals	X	
Electronic Control Group [Auto-Guide and ISO11783]	X	
Automatic Guidance	X	
Right Hand Window Wiper		X
AM/FM Cassette Radio w/Weather Band		X
Deluxe AM/FM radio w/Weather Band/Cassette and Alarm		X
Deluxe AM/FM radio w/Weather Band/Single CD and Alarm		X
Six Disc CD Player [requires deluxe radio and CD changer ready package]		X
Product Link 201 [includes receiver and hardware]		X
Roof Bracket		X
Hitch		
Wide-Swinging Controlled Roller Drawbar	X	
Steerable Three-Point Hitch	X	
Drawbar Support Kit [for use with drawbar loads exceeding 8000 lb (3729 kg) but not 12000 lb (5443 kg)]		X
Chassis		
Handrail [additional inboard handrail on steps]	X	
Fuel Tank [additional 30 gal (114 L) fuel tank] on MT835, MT845, and MT855	X	
Vandalism Group		X
Engine Side Shields	X	
Fender Extensions	X	
Fire Extinguisher Bracket		X
Front Counterweights		
- Front Bracket	X	
- 1924 lb (873 kg) [14 front weights and bracket]	X	
- 2536 lb (1150 kg) [20 front weights and bracket]	X	
Idler Weights		
- 2000 lb (907 kg) [16 weights]	X	
- 3500 lb (1588 kg) [28 weights]	X	
Undercarriage Weights		
-3175 lb (1440 kg) [32 weights]	X	
-6275 lb (2846 kg) [64 weights]	X	

Implement Hydraulics		
#4 Implement Hydraulic Valve [for controlled drawbar]	X	X
#4 Implement Hydraulic Valve [for steerable hitch]	X	X
#5 Implement Hydraulic Valve [for controlled drawbar]	X	X
#5 Implement Hydraulic Valve [for steerable hitch]	X	X
#6 Implement Hydraulic Valve [for controlled drawbar]		X
#6 Implement Hydraulic Valve [for steerable hitch]		X
Case Drain with Filter Kit		X
Standard Flow Power Beyond Kit [1/2" supply, return and load sense]		X
High Flow Power Beyond Kit [3/4" supply, return and sense]		X

11. Serviceability

11.1. Service Refill Capacities/Factory Fill Fluids

11.1.1. Challenger MT835 and Challenger MT845

Compartment or System	Liters	US gal
Cooling System	49	13
Fuel Tank (Standard)	1159	305
Fuel Tank (Optional)	330	1254
Engine Crankcase and Filter	30	7.9
Hydraulic System	250	66
Front Idler Hub	.5	.13
Midwheel Hub	.25	.07
Wide Drive Wheel Hub	1.6	.42
Windshield Washer Reservoir	4.5	1.2

Factory Fill Fluids	
Cooling System	Caterpillar Extended Life Coolant
Engine Crankcase	Caterpillar Multi-grade DEO SAE 10W30
Hydraulic System	Caterpillar MTO SAE 10W30
Front Idler Hub	Caterpillar MTO SAE 10W30
Midwheel Hub	Caterpillar MTO SAE 10W30
Drive Wheel Hub	Caterpillar MTO SAE 10W30

11.1.2. Challenger MT855 and Challenger MT865

Compartment or System	Liters	US gal
Cooling System	53	14
Fuel Tank (MT855 – Standard)	1159	305
Fuel Tank (MT855 – with optional tank)	1254	330
Fuel Tank (MT865)	1254	330
Engine Crankcase and Filter	34	9.0
Hydraulic System	250	66
Front Idler Hub	.5	.13
Midwheel Hub	.25	.07
Wide Drive Wheel Hub	1.6	.42
Windshield Washer Reservoir	4.5	1.2

Factory Fill Fluids	
Cooling System	Caterpillar Extended Life Coolant
Engine Crankcase	Caterpillar Multi-grade DEO SAE 10W30
Hydraulic System	Caterpillar MTO SAE 10W30
Front Idler Hub	Caterpillar MTO SAE 10W30
Midwheel Hub	Caterpillar MTO SAE 10W30
Drive Wheel Hub	Caterpillar MTO SAE 10W30

11.2. Maintenance

*Easy Access to
Daily Service
Points*



Figure 100

Easy access to all daily service points is designed into the Challenger MT800 Series tractors. One ground-level dipstick checks the engine oil level while an easy-to-view sight gauge is used to check the hydraulic oil level. Opening the gas strut-assisted hood, allows for a quick and easy inspection of the cooling system and engine. The single point of fuel fill is easily accessible from the entry platform. There is no daily greasing required.

Fluid sampling ports are factory installed on all major systems (engine, hydraulics, and radiator). Oil and filter changes are easy with strategically located vertical filters. The batteries located in front of the radiator are maintenance-free. The engine and radiator are equipped with ecology drains. An optional ecology drain is available for the powertrain. The air conditioning system uses environmentally friendly R134A refrigerant.

The Challenger MT800 Series tractors are designed to minimize downtime and maximize field time.

11.3. Service Maintenance Chart Schedule

Before each consecutive interval is performed, all of the maintenance requirements from the previous interval must also be performed.

Every 10 Service Hours or Daily

- Cooling System Level - Check
- Engine Oil Level - Check
- Fuel System - Fill
- Hydraulic System Oil Level - Check
- Undercarriage (Mobil-trac) System - Inspect
- Water Separator (Fuel System) - Check

Every 50 Service Hours

- Air Tank - Drain
- Three-Point Hitch - Lubricate

Initial 250 Service Hours

- Hydraulic System Oil Filters - Replace

Every 250 Service Hours

- Battery - Inspect
- Belt (Air Conditioner and Alternator) - Inspect
- Belt (Fan and Water Pump) - Inspect
- Cooling System Additive (DEAC) - Add
- Engine Oil Sample - Obtain
- Engine Oil and Filter - Change
- Hydraulic System Oil Sample - Obtain

Initial 500 Service Hours

- Engine Valve Lash - Check

Every 500 Service Hours

- Cooling System Coolant Sample - Obtain
- Engine Crankcase Breather - Clean
- Fuel Filter (Primary) - Clean/Replace
- Fuel Filter (Secondary) - Replace

Every 1000 Service Hours

- Air Filter (Engine Primary) - Replace
- Air Filter (Engine Secondary) - Replace
- Hydraulic Screen (Motor Case Drain) - Remove/Clean
- Hydraulic Filter (Motor Case Drain) - Replace
- Hydraulic System Oil - Change
- Hydraulic System Oil Filters - Replace
- Hydraulic System Oil Suction Screen - Remove/ Clean
- Rollover Protective Structure (ROPS) - Inspect
- Seat Belt - Inspect

Every 2000 Service Hours

- Air Dryer Cartridge - Replace
- Engine Valve Lash - Check

Every 3000 Service Hours

- Cooling System Coolant (DEAC) - Change
- Cooling System Extended Life Coolant Extender - Add
- Refrigerant Accumulator (With Desiccant) - Replace
- Seat Belt - Replace

Every 6000 Service Hours

- Cooling System Extended Life Coolant - Change

12. Detailed Specifications

	MT835	MT845	MT855	MT865
Performance Ratings				
Rated - ghp (kW)	340 (254)	380 (283)	450 (335)	500 (433)
Power Growth	8%	8%	8%	8%
Rated PTO - hp (kW)	275	313	374	416
Peak Torque (PTO) rpm	1400	1400	1400	1400
Torque Rise % (PTO)	52%	52%	52%	52%
Drawbar HP (kW) [firm ground]	248 (185)	277 (207)	329 (245)	365 (272)
Engine				
Make/Model	Caterpillar C12	Caterpillar C12	Caterpillar C15	Caterpillar C16
Cylinders/Aspiration	6 cyl/ATAAC	6 cyl/ATAAC	6 cyl/ATAAC	6 cyl/ATAAC
Displacement - in ³ (L)	732 (12)	732 (12)	893 (14.6)	964 (15.8)
Bore - inch (mm)	5.1 (130)	5.1 (130)	5.4 in (137)	5.5 (140)
Stroke - inch (mm)	5.9 (150)	5.9 (150)	6.5 (165)	6.75 (171)
Rated Speed	2100 rpm	2100 rpm	2100 rpm	2100 rpm
Transmission				
Standard	16 X 4 Powershift	16 X 4 Powershift	16 X 4 Powershift	16 X 4 Powershift
Brakes				
Type	Multi-disc, oil-cooled	Multi-disc, oil-cooled	Multi-disc, oil-cooled	Multi-disc, oil-cooled
Location	Steering Differential	Steering Differential	Steering Differential	Steering Differential
Steering				
Type	Speed Compensated Electrohydraulic Differential Steer	Speed Compensated Electrohydraulic Differential Steer	Speed Compensated Electrohydraulic Differential Steer	Speed Compensated Electrohydraulic Differential Steer
Turning Radius - ft (m)	Spot Turn	Spot Turn	Spot Turn	Spot Turn
Electrical System				
Alternator Amperage	160	160	160	160
Batteries	3-12V	3-12V	4-12V	4-12V
Cold Cranking Amps	2850	2850	3800	3800
Work Lights	8	8	8	8
Roading Lights	2	2	2	2
Implement Hydraulics				
System Type	Electrohydraulic Closed Center – Load Sensing	Electrohydraulic Closed Center – Load Sensing	Electrohydraulic Closed Center – Load Sensing	Electrohydraulic Closed Center – Load Sensing
Sump Capacity - U.S. gal (L)	70 (265)	70 (265)	70 (265)	70 (265)
Pump Capacity - gpm (lpm)	43.5 (166)	43.5 (166)	43.5 (lpm)	43.5 (lpm)
Pump Capacity – gpm (lpm)	59 (223)	59 (223)	59 (223)	59 (223)
System Pressure - psi (kPa)	2900 (20325)	2900 (20325)	2900 (20325)	2900 (20325)
Flow @ Couplers - gpm (lpm)	1–30 (3.8–115)	1–30 (3.8–115)	1–30 (3.8–115)	1–30 (3.8–115)
PTO (Optional)				
Rpm @ 2000 Engine rpm	1000	1000	1000	1000
Standard Shaft	20-spline	20-spline	20-spline	20-spline
Standard Spline Size - inch (mm)	1.75 (45)	1.75 (45)	1.75 (45)	1.75 (45)
Mobil-trac System				
Idle Diameter - inch (mm)	37 (950)	37 (950)	37 (950)	37 (950)
Idle Widths - inch (mm)	5,8.38 (127, 214)	5,8.38 (127, 214)	5,8.38 (127, 214)	5,8.38 (127, 214)
Midwheel Diameter - inch (mm)	14 (356)	14 (356)	14 (356)	14 (356)
Midwheel Widths - inch (mm)	5.2, 8.8 (132, 224)	5.2, 8.8 (132, 224)	5.2, 8.8 (132, 224)	5.2, 8.8 (132, 224)
Driver Diameter - inch (mm)	61.7 (1550)	61.7 (1550)	61.7 (1550)	61.7 (1550)

Driver Widths - inch (mm)	5.5, 8.8 (140, 225)	5.5, 8.8 (140, 225)	5.5, 8.8 (140, 225)	5.5, 8.8 (140, 225)
Belts Options - inch (mm)	18, 27.5, 30, 36 (457, 699, 762, 914)	18, 27.5, 30, 36 (457, 699, 762, 914)	18, 27.5, 30, 36 (457, 699, 762, 914)	18, 27.5, 30, 36 (457, 699, 762, 914)
Track Gauge				
Gauge - inch (mm)	90 –128 (2286 – 3251)	90 –128 (2286 – 3251)	90 –128 (2286 – 3251)	90 –128 (2286 – 3251)
Three-Point Hitch (Optional)				
Category	III/IVN & IV	III/IVN & IV	III/IVN & IV	III/IVN & IV
Maximum Lift – lb (kg)	19,500 (8845)	19,500 (8845)	19,500 (8845)	19,500 (8845)
Drawbar				
Maximum Vertical Load – lb (kg)	10000 (4536)	10000 (4536)	10000 (4536)	10000 (4536)
Standard Drawbar Swing (deg)	32	32	32	32
Dimensions – in (mm)				
Height	138 (3505)	138 (3505)	138 (3505)	138 (3505)
Length	269 (6833)	269 (6833)	269 (6833)	269 (6833)
Wheel Base	118.1 (3000)	118.1 (3000)	118.1 (3000)	118.1 (3000)
Ground Clearance	16.8 (427)	16.8 (427)	16.8 (427)	16.8 (427)
Weight – lb (kg)				
Shipping Weight	40000 (18144)	40000 (18144)	41000 (18598)	41000 (18598)
Maximum Recommended Ballasted Weight	50000 (22680)	50000 (22680)	50000 (22680)	50000 (22680)
Maximum Laden Weight	60000 (27216)	60000 (27216)	60000 (27216)	60000 (27216)

