

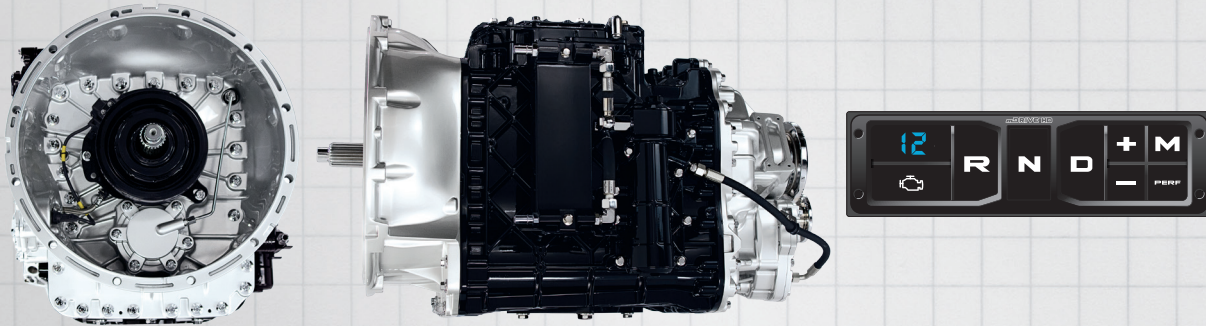
# **mDRIVE HD 12 SPEED TMD12AFD-HD**

## **Direct Drive**

## **2 Reverse Gears**



**mDRIVE™ HD**



# **Weighs less. Carries more.**



Armed with the transmission that won't weigh you down, you're up for any challenge. Mack's lightweight, mDRIVE™ HD heavy-duty automated manual transmission comes standard on Mack® Granite® and is made to resist the wear and tear of your toughest jobs.

[MackTrucks.com](http://MackTrucks.com)

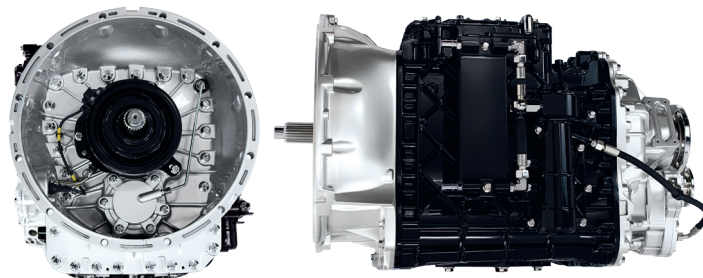
**BORN READY.**



# Mack® *m*DRIVE™ HD F Series Transmission

The *m*DRIVE HD heavy-duty automated manual transmission comes standard on Mack® Granite® trucks to help tackle whatever challenges you face on the job. This 12-speed, two-pedal transmission offers up to 1,920 lb.-ft. of torque, horsepower ratings from 325 to 505 HP and is designed to integrate seamlessly with Mack MP7® and MP8® engines.

Because *m*DRIVE HD is in constant communication with your engine, it's continuously monitoring changes in grades, vehicle speed, acceleration, torque demand, weight and other factors, so there's no compromising on performance.



## *m*DRIVE HD F Series offers the following features:

### **Grade Gripper**

There's no awkward and dangerous roll-back when stopping on a grade. Grade Gripper keeps your position for up to three seconds after the brake pedal is released.

### **Rock Free**

Don't let troublesome terrain bog you down. When your truck gets stuck, *m*DRIVE HD rocks the vehicle back and forth to break you free.

*(Optional with Mack Fleet shifter package)*

### **Power Launch**

When rocking won't release your truck from sand and loose soil, *m*DRIVE HD responds with more power than you thought possible. It allows you to raise the engine RPM and torque prior to engaging drive mode to free your vehicle.

*(Optional with Mack Fleet shifter package)*

### **PTO Options**

The *m*DRIVE HD is available with up to six different combinations of rear transmission-mounted PTO options and a selection of factory-installed piston and gear-driven hydraulic pump options.

### **PowerLeash™ Engine Brake**

Get maximum performance from your engine brake. By setting your downhill speed, the engine, engine brake and transmission work together to allow a faster controlled descent speed in a higher gear without overspeeding the engine.

### **Enhanced Construction Shift**

Heavy-duty construction jobs demand more aggressive shifting. Enhanced Construction Shift maximizes gradeability and improves starting and shifting on rough terrain.

*(Optional with Mack Fleet shifter package)*

### **Heavy Haul Shift**

Meet Mack's most assertive shift strategy yet. Designed for the trucks that shoulder your largest loads, Heavy Haul Shift offers even more performance-oriented shift points and less skip shifting. Recommended for loads over 160,000 GCW.

*(Requires Mack Premium shifter package)*

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## **COMPLETE INTEGRATION**

As part of Mack's legendary integrated powertrain, *m*DRIVE HD works seamlessly with Mack engines and axles for improved efficiency, increased uptime and lower cost. Because when all the pieces perform together, everything else falls into place.

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## **LIGHTER THAN THE COMPETITION**

Even though *m*DRIVE HD is built strong, it won't weigh you down. It's hundreds of pounds less than competitors, so you can ditch the dead weight and increase your payload.

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## **INCREASED PRODUCTIVITY**

The *m*DRIVE HD is automated, so it's easier to work than traditional manual transmissions. Because drivers don't have to worry about shifting gears, they're more rested and ready to finish the job with increased focus and productivity.

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## **ONE-STOP SERVICE**

Because *m*DRIVE HD is a Mack transmission, it's serviced in Mack's industry-leading, coast-to-coast dealer network and supported by our comprehensive Uptime Services. Forget the additional time or hassle spent dealing with third-party repairs.

# MACK *m*DRIVE HD F Series TRANSMISSION

## DIRECT DRIVE SHIFTER FEATURES

FEATURES	FLEET	PREMIUM
AUTO NEUTRAL	STANDARD	STANDARD
GRADE GRIPPER	STANDARD	STANDARD
GEAR SELECTION ADJUSTMENT	OPTIONAL	STANDARD
POWERLEASH ENGINE BRAKE	STANDARD	STANDARD
ENHANCED CONSTRUCTION SHIFT **	OPTIONAL	STANDARD
EASY SHIFT **	OPTIONAL	OPTIONAL
HEAVY HAUL SHIFT **	OPTIONAL	STANDARD
CRUISE 'N BRAKE	OPTIONAL	STANDARD
LOW SPEED MODULATION CONTROL	STANDARD	STANDARD
MACKCELLERATOR	OPTIONAL	STANDARD
ROCK FREE	OPTIONAL	STANDARD
POWER LAUNCH	OPTIONAL	STANDARD

\*\* These options are selectable under the M05- PID condition.

## DIRECT DRIVE SPECIFICATIONS

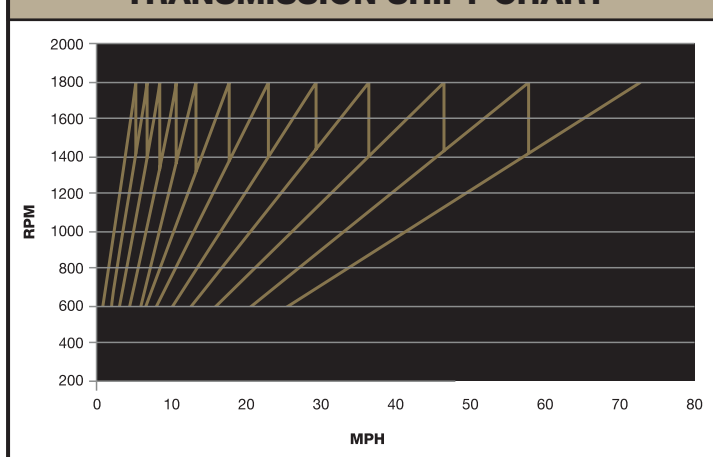
TYPE	12 SPEED AUTOMATIC MANUAL TRANSMISSION
LENGTH	35.1" [891 MM]
WEIGHT (DRY)	597 LB [271 KG]
OIL CAPACITY	16.9 QUARTS [16 L]
TORQUE RATING	1920 LB. FT. [2600 N•m]
NUMBER OF SPEEDS - FORWARD	12
NUMBER OF SPEEDS - REVERSE	2
CASE, BELL HOUSING MATERIAL	ONE PIECE HEAT TREATED ALUMINUM
CASE, BELL HOUSING TYPE	SAE #1
TYPE OF GEARS	HELICAL
CONTROL	D PANEL DASH MOUNTED SHIFTER
SHIFTER INDICATORS	R-REVERSE / N-NEUTRAL / D-DRIVE / M-MANUAL
LUBRICATION	SPLASH & PRESSURE

For Information Concerning Power Take-Offs Consult Power Take-Off Sheets

## DIRECT DRIVE GEAR RATIOS

FORWARD GEAR	RATIO	% STEP
1st	14.94	
2nd	11.73	27
3rd	9.04	30
4th	7.09	28
5th	5.54	28
6th	4.35	27
7th	3.44	26
8th	2.70	27
9th	2.08	30
10th	1.63	28
11th	1.27	28
12th	1.00	27
REVERSE GEAR	RATIO	% STEP
1st	17.48	
2nd	13.73	

## TRANSMISSION SHIFT CHART



# Feature Description

## *No change from current options*

### **Gear Selection Adjustment**

The driver can manually select gears using the up / down buttons located on the Premium shifter. The Driver Display will indicate how many up / down gears are available by the means of up / down arrows.

### **Idle Governor Driving Mode**

This feature is included in every software feature package and is useful in the lower gear range (1-6), for example when driving slowly in congested areas. The Idle Driving mode is engaged by the driver removing their foot from the accelerator and allowing the vehicle to idle along. The transmission automatically selects the gear which best suits the speed. When the Basic shifter is utilized, slightly pressing the accelerator or brake pedal will change engine speed to facilitate an upshift or downshift. Although the engine load may vary, the Idle Governor will adjust the torque to maintain idle speed and therefore achieve constant vehicle speed. The feature also works in Reverse and is quite helpful when backing up a trailer.

### **Gear Selection of Start Gear**

The driver can in the “Manual mode” select start gear in the range from 1-3.

For Tractor models, in the “Drive mode” the transmission will select the start gear based on the load, the grade and engine size. Typically the start gear is 1 or 2 with a trailer connected and 4 when bob-tailing. However, the driver can adjust the selected gear by up to two gears above the calculated as long as it does not exceed “Highest available start gear”. The highest available start gear is a customer programmable parameter in the range from 1-6 with a default value of 6. For Truck configurations the starting gear will be 1.

### **Performance Mode**

A button on the Premium gear lever lets the driver select Performance operating mode.

- Economy, the transmission will select shift points and command engine parameters maximizing fuel economy.
- Performance mode selects shift points and engine parameters maximizing to be driven in high grades and other rough conditions. Improved ability to rock free.

## **There are three customer programmable settings for the Performance mode:**

1. Performance mode available. When you press the button, the transmission goes to PERF mode, and stays there until you turn-off the truck, or press the button again. Recommended setting for off-road vehicles.
2. Performance mode available. Once enabled the mDrive monitors the engine utilization and automatically returns to Economy if the power demand for a specified time window drops to a level that can be handled by the Economy mode. In other words it minimizes the time in Performance mode, which improves Fuel Economy.
3. Performance mode disabled. Best for fuel economy.

### **Auto Neutral when Parking Brake applied**

In situations where the mDrive is still in gear after the parking brake has been applied, the mDrive will go into Neutral after four minutes in order to protect the release bearing from excessive temperature and wear. If the driver presses the accelerator pedal, the transmission engages the gear was selected before.

### **Auto Neutral at Key-off if Gear engaged**

In order avoid “torque lock-up” of the driveline when shutting off the engine with a gear engaged; mDrive will automatically go into Neutral during key-off.

### **Basic PTO functions**

Possibility to engage PTO in vehicle speeds up to 6Mph (speed limit depends on the rear axle ratio)

Pre-defined splitter positions: SW parameter defines splitter to engage when use of transmission PTO.

### **Low Speed Modulation Control**

Provides smooth low speed control without the need to continually brake and accelerate.

## “P” Additional Features “Rock Free”

In situations where wheel spin occurs and a vehicle becomes stuck, the mDrive transmission has the ability to rock the vehicle back and forth to maneuver out of the stuck condition.

A combination of carefully pressing and releasing the accelerator, to ease the vehicle forward or backwards, will produce the rocking motion to elongate the wheel tracks which have caused the vehicle to become stuck.

Engage as follows:

- Engage differential locks
- Turn off traction control
- Select Performance mode of the mDrive
- Press the M button for Manual selection, and select 1st gear, or the 1st reverse gear
- Carefully press accelerator pedal up and down with a smooth pumping action



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## “P” Additional Features “Power Launch”

If the vehicle becomes “really stuck” in sand or very soft soil and are unable to get it moving again by trying to rock it free. That’s where the Power Launch feature comes in. With the Performance software package, the mDrive has the ability to use full engine torque to get the vehicle moving once again.

Engage as follows:

- Engage differential locks
- Select Performance mode of the mDrive
- Press the M or D button for Manual/Drive, use 1st gear, or the 1st reverse gear
- Push and hold the minus (-) button on the gear selector
- Completely depress the accelerator – the engine will rise to 1300 rpm
- Release the minus (-) button and the clutch is engaged, launching the vehicle free



**Grade Gripper** is a safe, convenient way to hold a vehicle on-grade (road inclines and declines) without risk of roll-back or clutch burn-out.

Grade Gripper 'grips' both the tractor and the trailer brakes.

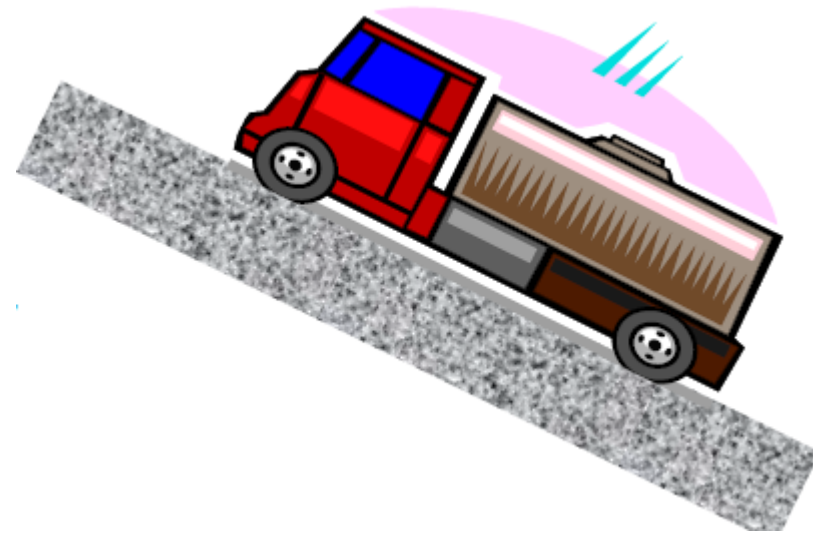
When the brake pedal is released, Grade Gripper maintains braking until the throttle pedal is applied, or until a 3 second timer expires.

Grade Gripper only applies on grades at 0 mph, with the service brakes applied.

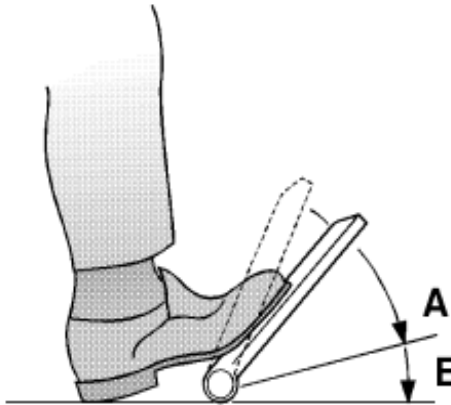
A dash switch can be used to disable Grade Gripper, whenever needed. If disabled, the switch lamp flashes and a Co-Pilot message informs the driver.



Grade Gripper Disabled



The **MackCellerator** is a 2-position throttle pedal. The first position (A) provides 100% throttle. If the driver presses further, the pedal passes a detent to full travel (B). The mDRIVE will then automatically downshift (assuming there is sufficient engine RPM range).



**A = 100% throttle**

**B = Downshift**

Think of MackCellerator as an easy way to engage passing gear (down-shift), without the driver needing to take his/her eyes off the road.



## PowerLeash+ engine brake controls include the following features:

**‘Cruise’n Brake’** automatically engages PowerLeash+ at 3

mph above the cruise control target set speed, then auto disengages it prior to resuming cruise (0.5 mph above). Note: ‘Cruise’n Brake’ only functions in Auto mode.

**‘Latch’** mode automatically engages the engine brake

whenever the throttle pedal is released and the PowerLeash+ control switch is in the ‘ON’ position.

**‘Auto’** mode keeps the engine brake off unless a target

downhill braking set speed is specified, using the ‘SET-’ button. PowerLeash+ will automatically and progressively (0-100%) attempt to maintain the set speed. The control switch must be in the ON position. Applying the service brakes will not automatically activate PowerLeash+.



**CONTROL SWITCH:**  
Turn on to enable  
Powerleash+ braking  
functions

**MODE SWITCH**  
Sets brake  
controls in ‘Latch’  
or ‘Auto’ mode;  
Set target MPH.

