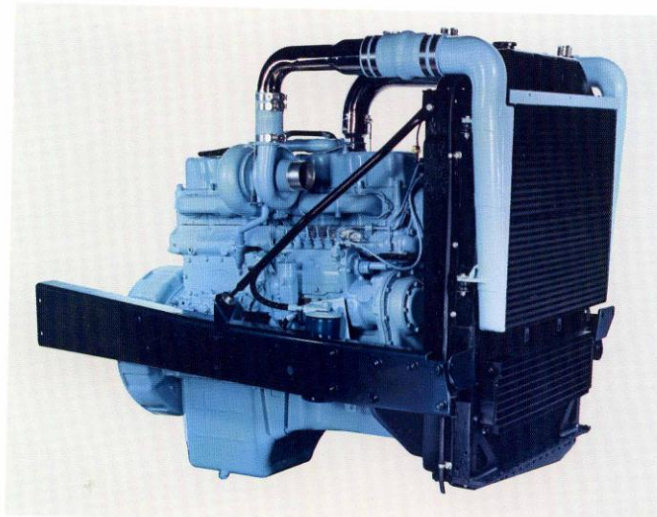


Mack Trucks
introduces you
to a new level
of fuel economy
in the '80s
with new,
high-efficiency
Econodyne
engines

ECONODYNETM





Econodyne EM6-300(R)

MACK *Econodyne* ^{T.M.}

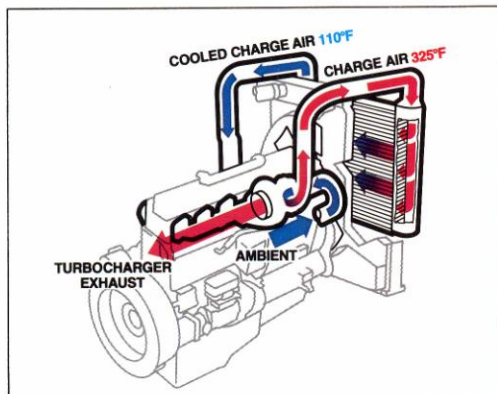
the new generation of engines for heavy-duty highway trucks

Up to 10% more fuel efficient than other manufacturers' comparable engines currently available...more durable than ever before.

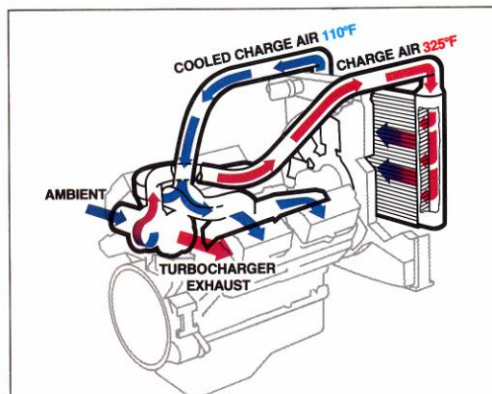
The new Econodyne series is comprised of 10 full- and reduced-speed engines—in-line six-cylinder engines ranging from 225 to 350 horsepower and V-8s from 400 to 440 horsepower.

Mack pioneered the dieselization of heavy-duty trucks in America. With the introduction of Mack's first diesel in 1938, the fuel-efficient Thermodyne® engine in the fifties, the high-torque-rise and still-more fuel-efficient Maxidyne® six-cylinder engine in 1967, and finally the Maxidyne V-8 in 1969, Mack revolutionized the heavy-duty diesel engine concept in the trucking industry.

Building on this extensive background, Mack is now introducing its new Econodyne series engines, which include both Maxidyne and conventional-torque-rise versions. The Econodynes are the most fuel-efficient engines Mack has yet produced. The Econodynes are service-proven engines that emphasize Mack Trucks' decades of leadership in fuel-efficient diesel engines.



E6 Series



EM9-400/E9-440

Mack's new chassis-mounted charge-air cooling

The heart of the Mack Econodyne engine is advanced turbocharging and Mack's *new* chassis-mounted charge-air cooling system. Chassis-mounted charge-air cooling offers the following improvements over other cooling systems:

1. Improved fuel economy
2. Increased horsepower
3. Improved engine durability

These benefits are achieved without adverse effects on peak cylinder pressures, gaseous emissions or smoke.

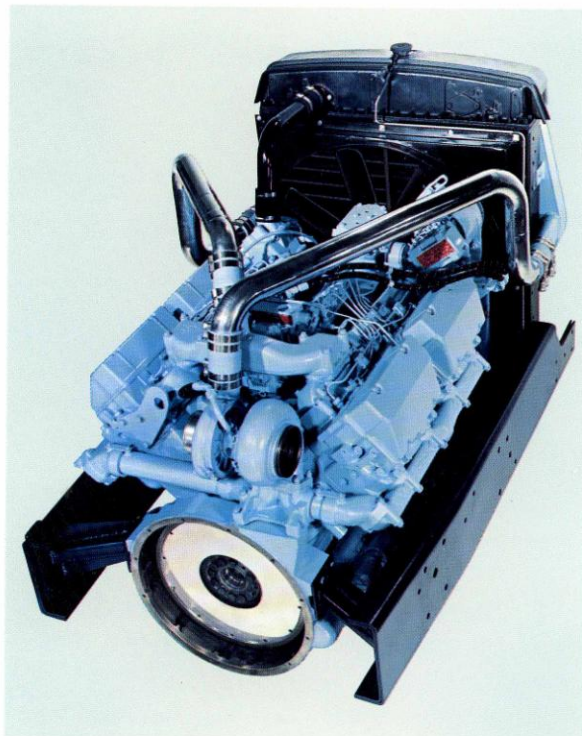
Through chassis-mounted charge-air cooling, engine induction air is cooled in a heat exchanger mounted ahead of the radiator. The elimination of the tip turbine fan and much of the intercooling apparatus in high mileage vehicles results in improved engine accessibility for lower engine maintenance expense. Cooling air for the heat exchanger is supplied by the engine fan as well as the ram effect of the vehicle's forward motion. Air that leaves the turbocharger at 325°F is cooled to 110°F.

This cooler, denser air permits more complete combustion of the fuel, resulting in increased en-

gine performance with less smoke and acceptable gaseous emissions levels.

In addition, lowering of the inlet manifold air temperature has the beneficial effect of significantly extending engine durability. Depending on the engine model selected, the chassis-mounted charge-air cooling system can achieve reductions of up to eight percent in brake specific fuel consumption.

In 1973, Mack introduced the first single-stage charge-air cooling system for heavy-duty highway diesel trucks. Since then, Mack has conducted an on-going program of charge-air systems development and performance evaluation. Mack is the only North American producer of heavy-duty trucks who manufactures all driveline components. This balanced-design concept assures complete compatibility among engine, transmission and rear axle to achieve the maximum in performance and fuel economy. They are all designed to work together, better, longer. The ability of Mack to maintain precise balance between the chassis and such an advanced system as chassis-mounted charge-air cooling is a major achievement yet to be matched.



Econodyne V-8

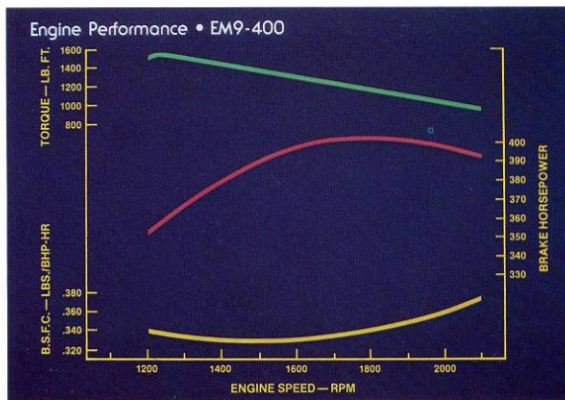
*Econodyne*TM

Econodyne V-8 engines...in-service testing proves better tank mileage

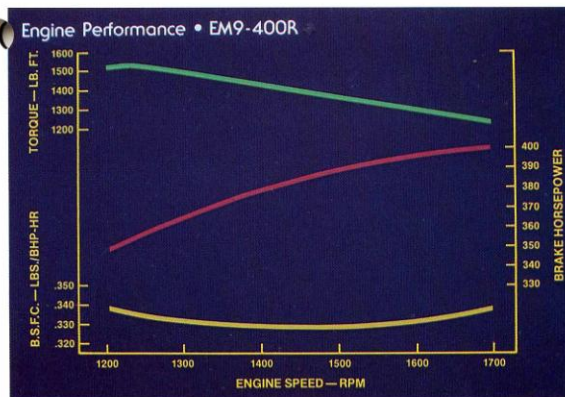
Since the first Mack V-8 engine went into production in 1962, the engine has evolved through various levels of turbocharging and aftercooling. With each new engineering advancement employed, Mack V-8 engines have established an enviable reputation for performance, durability and fuel efficiency. The ability to control both chassis and powertrain design has made it possible for Mack to adapt the chassis-mounted charge-air cooling system into the vehicle package.

The Econodyne V-8 series, with the chassis-mount-

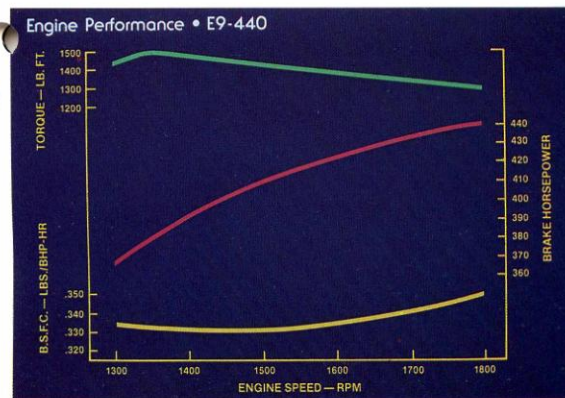
ed charge-air cooling system is today the most fuel-efficient engine in its horsepower class. This series of Econodyne engines includes the EM9-400, 400 horsepower, governed at 2100 RPM, 55% torque rise; the EM9-400R, 400 horsepower, governed at 1700 RPM, 23% torque rise; and the E9-440, 440 horsepower, governed at 1800 RPM, 16% torque rise. Since their inception in 1972, E9 engines have amassed over seven million highway miles in customer service.



EM9-400



EM9-400R



E9-440

Throughout the operating speed range of the EM9-400R, brake specific fuel consumption does not exceed .34 lbs./BHP-HR. This has not been achieved by any other engine on the market in this horsepower class. Performance curves for the EM9-400 high-torque-rise V-8 illustrate unexcelled fuel economy... performance tailored to match the simple, easy-to-operate Mack five- and six-speed Maxitorque® transmissions. The fuel curve for the E9-440 shows comparably excellent fuel economy.



Econodyne V-8 EM9-400

Econodyne fuel efficiency... up to 10% better than other manufacturers' comparable engines.

Since 1938, when Mack introduced its first diesel engine, Mack has been a leader in fuel economy. Today, Mack is the leader in fuel economy with up to a 10% advantage, when based on comparisons with similar engines and properly specified trucks.

Fuel savings in dollars

In the past 10 years, diesel fuel costs have soared, and projections for the next decade reflect a similar trend.

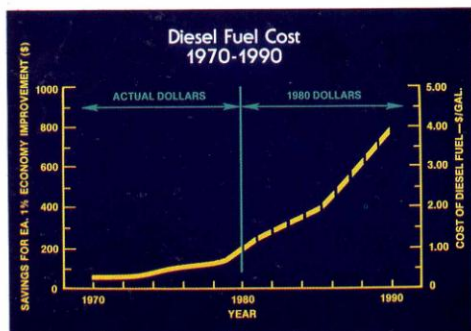


Fig. 1

Price per gallon has increased from \$0.20 in 1970 to \$1.00 in 1980, and will increase to an estimated \$4.00 in 1990... a 20-year increase of 1900%. The left-hand scale shows approximately how much a 1% improvement in fuel economy means in annual fuel savings, per vehicle, to an operator who runs each unit 100,000 miles per year. Today, with fuel at approximately \$1.20 a gallon, each 1% in fuel economy improvement provides a \$240 saving per truck per year. With 100 units, an operator will save \$24,000. A 3% improvement saves \$72,000. By 1985, this savings will increase to \$114,000 as fuel costs continue to rise.

Reduced-governed-speed engines and multiple-speed transmissions

The two most important characteristics of a heavy-duty truck engine are durability and fuel economy. Mack has always concentrated on achieving the optimum in both, and both durability and economy are greatly enhanced by reducing governed-engine speeds.

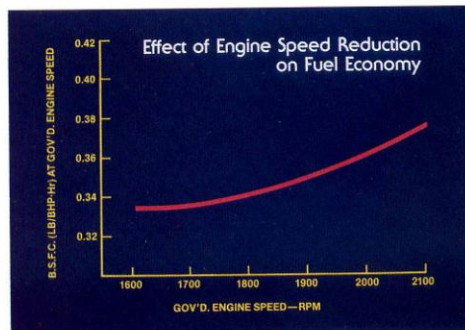


Fig. 2

This graph shows the very substantial reduction in the specific fuel consumption at full load governed speed that results from reducing the governed speed of a Mack EM6-300 engine from 2100 to 1600 RPM. The governed-speed specific fuel consumption drops from 0.375 @ 2100 to 0.333 @ 1600 RPM, an 11% improvement. With today's fuel costs—and the substantially higher ones coming—it is essential that high mileage line haul vehicles be equipped with reduced-governed-speed engines and appropriate multi-speed transmissions. Engines with moderate torque rise and/or extremely low governed speeds will require a transmission with more steps than will a high-torque-rise, full-speed engine.

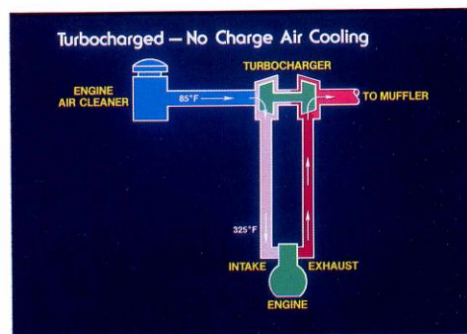


Fig. 3

Charge-air cooling... from 325°F to 110°F

This is Mack's first turbocharged diesel engine design. As you can see, 85°F air entering the turbocharger was heated to 325°F by the turbocharger compressor, and entered the engine at this temperature.

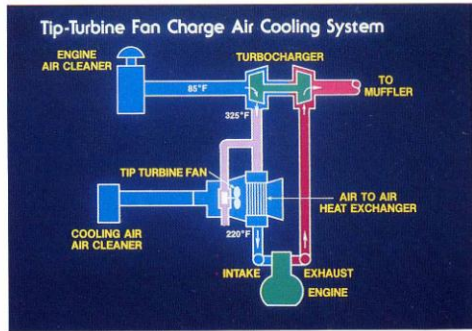


Fig. 4

In 1973, we introduced the Maxidyne® 300 with single stage tip-turbine-fan cooling. This system reduced the 325°F air temperature from the turbo to 220°F. While the original Maxidyne developed 237 horsepower, with the cooler air, Mack produced a 285 horsepower version while retaining the high torque rise. This design continued the essentially constant horsepower performance over the entire operating speed range.

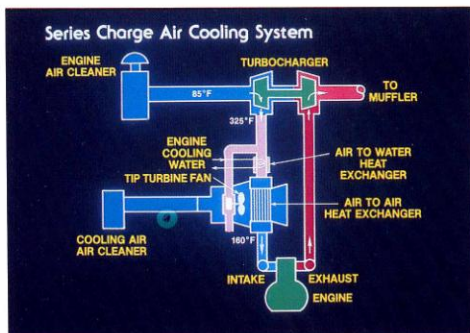


Fig. 5

A significant improvement was made in 1979 with the introduction of the series tip-turbine-fan system which used engine cooling system water as well as outside air to cool the air leaving the turbo. This system dropped the air temperature another 60°F to 160°F.

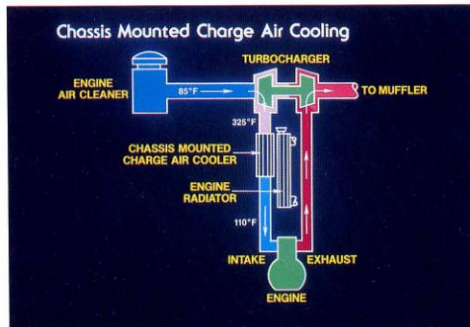


Fig. 6

The chassis-mounted air-to-air charge-air cooling system is the most advanced cooling system in the truck-building industry today. It provides another 50°F drop to

110°F for air entering the engine. This system is now available on most Mack six-cylinder engines for R and U Models, Cruise-Liner® and Super-Liner® highway trucks. Econodyne engines—all Mack engines equipped with chassis-mounted charge-air cooling—are the most fuel-economical engines for heavy-duty trucks on the highway today.

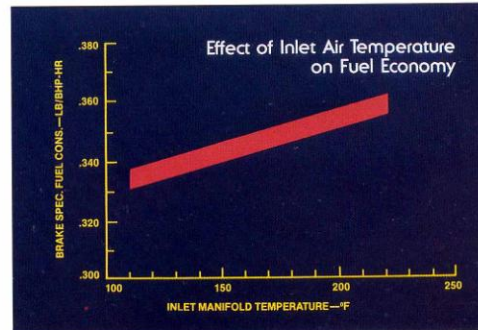


Fig. 7

This graph shows the gain in specific fuel consumption from 0.36 to 0.335—approximately 7%—that accompanies an inlet manifold temperature drop from 220°F with the single-stage tip-turbine-fan system to 110°F with the chassis-mounted system. All other domestic engine manufacturers use air-to-water cooling and, therefore, have been unable to achieve inlet manifold temperatures below approximately 200°F. Low inlet manifold temperatures increase durability, a critically important characteristic of Mack engines.

How do Econodyne engines compare with other Mack models and with other manufacturers' engines?

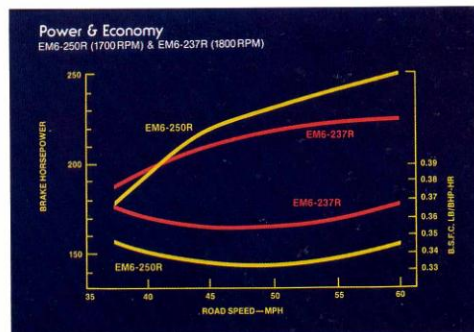


Fig. 8

Here are the power and fuel economy curves of the Econodyne EM6-250R compared with the Mack EM6-237R which does not have any form of aftercooling. The Mack Econodyne design increases power to 250 horsepower and substantially reduces the brake specific fuel consumption. This curve and all that follow are plotted against MPH rather than engine speed, so that comparisons of actual operating characteristics can be made even though governed engine speeds may not be the same.

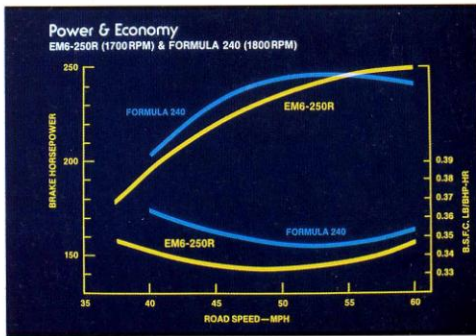


Fig. 9

This graph compares the Cummins Formula 240 governed at 1800 RPM with the Mack EM6-250R. The full-load BSFC of the Mack EM6-250R is from 2% to 6% better than the Formula 240.

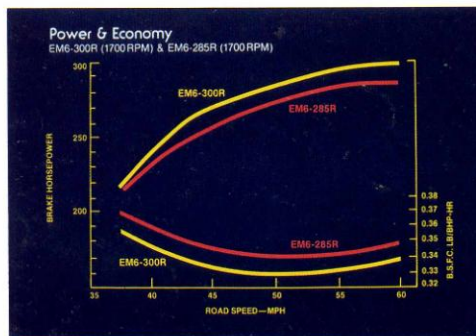


Fig. 10

Here's the comparison of the Mack Econodyne EM6-300R with the Mack EM6-285R. Chassis-mounted charge-air cooling on the Mack Econodyne EM6-300R permitted an increase of 15 horsepower while improving specific fuel consumption by about 2% over the EM6-285R.

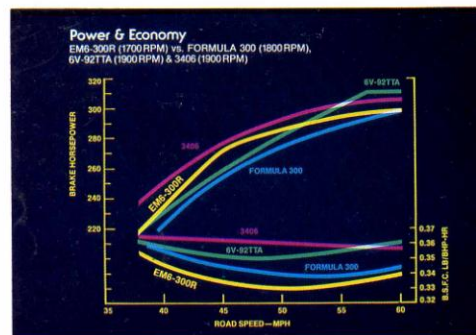


Fig. 11

Here is the Econodyne 300 compared with other manufacturers' engines in the 300 horsepower category. The Mack engine is 2% to 3% better than the Cummins Formula 300 and 6% to 7% better than the Detroit Diesel 6V92TTA and the Caterpillar 3406 in brake specific fuel consumption.

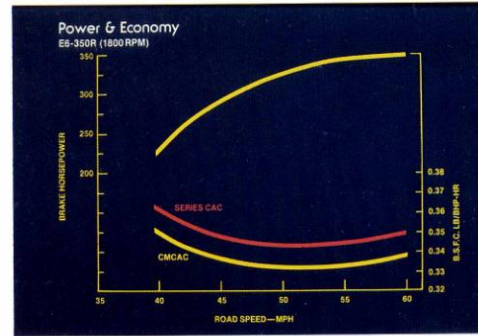


Fig. 12

The Econodyne E6-350R with chassis-mounted charge-air cooling has the same power curve as the original engine with series tip-turbine-fan aftercooling, but specific fuel consumption shows a 3% to 4% improvement.

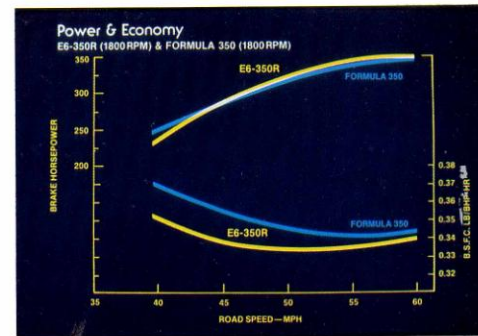


Fig. 13

Compared with the Cummins Formula 350, the specific fuel consumption of the Econodyne 350 is 2% to 4% better.

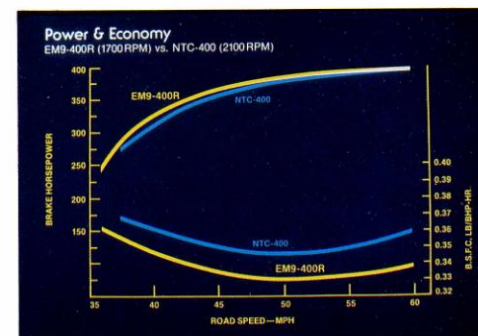


Fig. 14

The Mack EM9-400R V-8 has a 5% to 7% BSFC advantage over the NTC 400. While both engines are rated at 400 horsepower, the higher torque rise of the EM9-400R results in higher horsepower at every speed below the governed speed. The EM9-400R develops 400 horsepower at 1700 RPM, the NTC 400 at 2100 RPM. As a result, the Mack engine has a lower noise level, lower oil consumption and the durability advantage associated with reduced engine RPM.

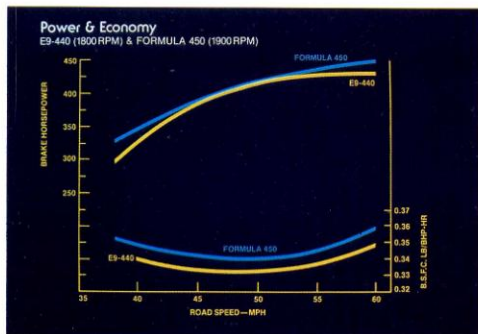


Fig. 15

As a result of the excellent operating performance of the EM9-400R, we are now offering a higher horsepower version of the E9 series, the E9-440. Compared with the Cummins Formula 450, the new E9-440 offers approximately the same horsepower with a 3% plus fuel economy advantage. In addition, the Formula 450 uses a more complicated series twin turbocharger arrangement.

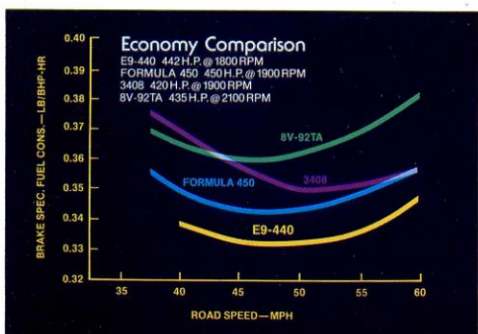


Fig. 16

Comparing engines in the 420 to 450 horsepower range, Mack Econodyne engines are over 3% more fuel efficient... 10% more fuel efficient than Detroit Diesel.

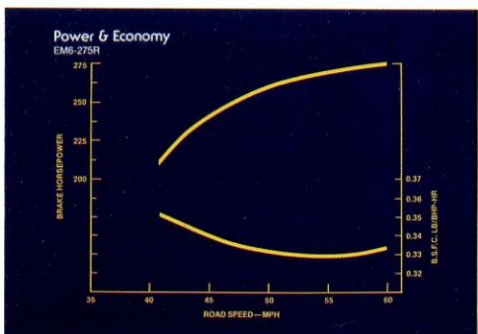


Fig. 17

Cummins and Caterpillar have recently announced engines governed at 1600 RPM, comparable with the Mack Econodyne EM6-275R which is also governed at 1600 RPM. The EM6-275R, which must be matched with a 10-speed transmission, has a specific fuel consumption at full load that never exceeds 0.338 throughout its operating speed range.

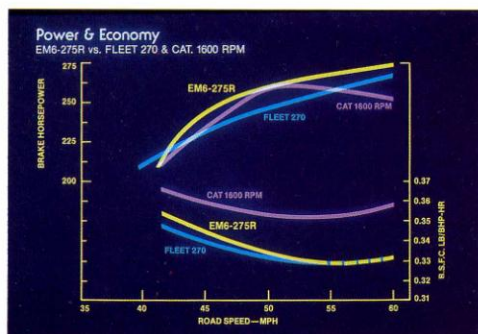


Fig. 18

Here is a comparison of the three 1600 RPM engines. The Econodyne 275 has an advantage of at least 5 horsepower over the Cummins Fleet 270 throughout the operating speed range. The Caterpillar horsepower comes close to that of Mack at about 52 MPH, but its rated power at governed speed is only 250 horsepower.

The Cummins Fleet 270 engine has a BSFC approximately equal to that of the Mack EM6-275R, which is 6% to 8% better than Caterpillar. The EM6-275R horsepower reduced-speed engine governed at 1600 RPM will be of particular interest to operators desiring optimum fuel economy at a slight sacrifice in maximum and average road speeds.

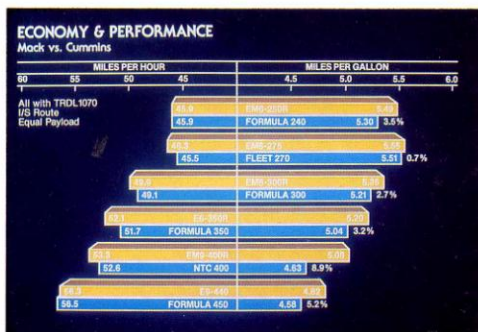


Fig. 19

Full-load specific fuel consumption, however, is only a partial indication of the efficiency of any engine. Every customer operation also includes an appreciable amount of running at part throttle which greatly influences mile-per-gallon fuel economy.

In the past, we have obtained vehicle fuel economy information from road tests, with all the inherent inaccuracies resulting from the variables of drivers, traffic, vehicle and atmospheric conditions. Today, we put all the required information relative to the engine, vehicle and road profile into our computers, and run what we call a *mission analysis* which gives us accurate comparative figures on MPG and average MPH.

The graph shows the MPG and the average MPH that would be achieved by Mack and Cummins engines as though they were operated on a typical interstate highway with identical trailers and equal payload. The same 10-speed transmission was used in all cases, but rear axle ratio was varied to give each vehicle a geared top speed as close as possible to 59 MPH at the governed speed of the engine. The Mack MPG advantage is 0.7% in the 270-

275 horsepower category, and ranges up to 8.9% when the EM9-400R is compared to the NTC 400. In all cases, Mack achieved equal or better average road speeds except in the comparison of the EM9-440 versus Formula 450 where the difference is only .2 MPH.

Not only are Mack engines more efficient than the comparable engines of other manufacturers in terms of full-load specific fuel consumption, but they are also capable of obtaining more miles per gallon in your operation.

Vehicle factors that influence economy

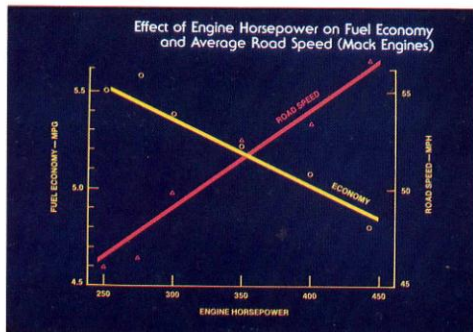


Fig. 20

The more powerful the engine, the lower the MPG fuel economy as illustrated here. For example, if you use a 350 horsepower engine rather than a 275 horsepower unit, you will attain about 5% lower MPG. Naturally, the higher horsepower gives better average speed, and in some cases it may be necessary to go to higher horsepower to meet your specific requirements.

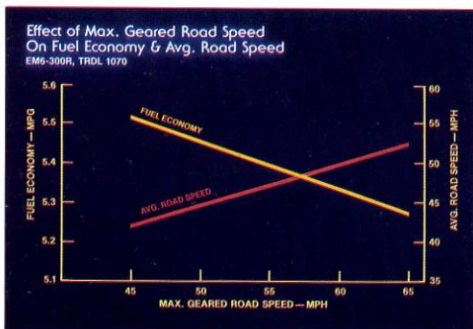


Fig. 21

The maximum full-load geared road speed should be held as low as possible. In rolling terrain, increasing maximum geared speed from 55 to 60 MPH reduces the MPG by 1.2% and produces an increase in trip average speed of 2.5 MPH.

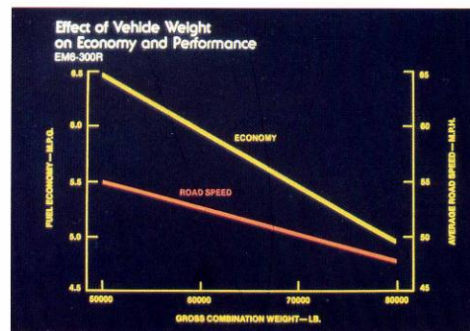


Fig. 22

Increased gross combination weight reduces fuel economy and average road speed. While 10,000 extra pounds can reduce MPG by approximately 5%, moving the highest payload will use the least amount of fuel from an overall energy consideration.



Fig. 23

Mack EM6 engines are approximately 600 pounds lighter than Cummins NT series engines. This means that for any given payload, the gross weight of a Mack vehicle with a Mack engine is 600 pounds lighter than it would be with a Cummins engine. Another 0.5% fuel economy advantage for Mack.

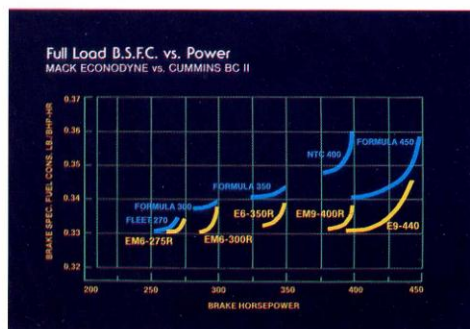


Fig. 24

This is how Mack's most fuel-efficient reduced-speed engines compare with the best Cummins engines. The graph shows a comparison of full load brake specific fuel consumption for five different engine horsepower categories. The left hand end of each curve shows the specific fuel economy and horsepower of each engine when it is operating at the speed which gives the minimum specific fuel consumption. The right hand end of the curve shows the specific fuel consumption and power output of each engine when it is operated at its governed speed.

The Cummins Fleet 270 has specific fuel economy essentially equal to the Mack EM6-275R. In all other cases, Mack has substantially better specific fuel economy over the entire operating range of the engine. Mack's superiority is most pronounced in the case of the EM9-400R compared with the NTC400.

Small loss in average road speed with reduced horsepower

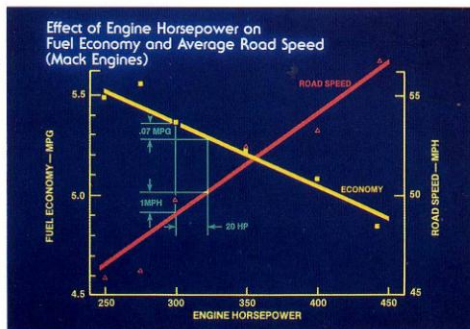


Fig. 25

The most fuel-thrifty engine is the one that puts out just enough horsepower to do the job. The graph shows the small loss in average road speed that results from relatively large reductions in horsepower, and is indicative of what you can expect from specifying lower power. The data illustrate that if you take away 20 horsepower from the engine, the average speed of the 72,000-pound GCW rig running in rolling terrain drops only one MPH. Based on current fuel prices, running 100,000 miles per year, sacrificing only one MPH can result in a fuel saving that translates to about \$300 per year for just one truck. Obviously, every MPH of unneeded average speed is money down the drain.

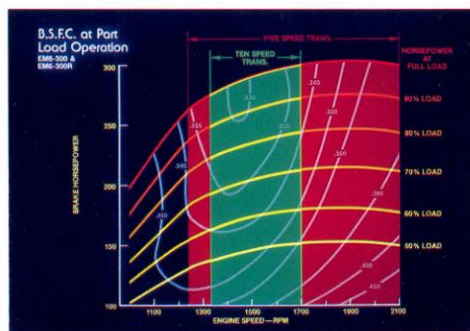


Fig. 26

This graph compares the Mack Econodyne EM6-300 and EM6-300R. The uppermost orange curve is the full-load brake horsepower curve for both engines. The curves below and parallel to the full-load power curve represent the various levels of part-load horsepower down to 50% load. The U-shaped curves indicate how specific fuel consumption varies with changes in load and speed. You can plot the familiar full-load BSFC curve by taking the values where each of these lines intersect the full-load horsepower curve. The green area between the two vertical green lines represents the engine operating speed range of the 1700 RPM engine when used with a 10-speed transmission. The combined red and green area represents the speed range of the 2100 RPM engines with a five-speed transmission. Note that the lowest value BSFC lines are concentrated between the two green lines that bracket the speed range of the EM6-300R engine. Notice also how much higher the BSFCs are between 1700 and 2100 RPM. To illustrate how operation at part throttle can affect fuel economy, let's suppose that we have two trucks, one with the EM6-300 at 2100 RPM with the five-speed Maxitorque transmission, and the other with the EM6-300R at 1700 RPM and a 10-speed transmission. Assume that the two trucks are geared for the same maximum speed of 57 MPH, and are pulling identical trailers with identical payloads. Now we dispatch them on the same run in rolling terrain where the horsepower requirement is never greater than 300 horsepower, and therefore they both can maintain a constant 57 MPH.

At 57 MPH, both are at their full-load-governed speeds of 2100 and 1700 RPM, respectively. Their horsepower output is identical at every level of engine load.

Part Load B.S.F.C. EM6-300(R) AT F.L. GOV'D. RPM

% LOAD	B.H.P.	BRAKE SPEC. FUEL CONS. AT F.L. GOV'D. ENGINE RPM LB./B.H.P.-HR.	
		2100 RPM ENGINE	1700 RPM ENGINE
100	300	.367	.337
90	270	.370	.338
80	240	.376	.340
70	210	.383	.346
60	180	.392	.352
50	150	.405	.362

Fig. 27

Conversion of B.S.F.C. to M.P.G.

$$\text{B.S.F.C.} \times \text{BRAKE H.P.} = \text{LB. OF FUEL/HR}$$

$$\frac{\text{LB. OF FUEL/HR.}}{7.0 \text{ LB./GAL.}} = \text{GAL./HR.}$$

$$\frac{\text{MI./HR.}}{\text{GAL./HR.}} = \text{M.P.G.}$$

Fig. 28

However, note that although the power outputs are equal at each percent of load, the BSFC is quite different. For example, at 80% load, the brake specific fuel consumption of the 1700 RPM engine is 0.340 LB/BHP-HR and compares to 0.376 for the 2100 RPM engine. Knowing the specific fuel consumption at each level of horsepower and the road speed, the MPG economy of each truck at each level of engine load can be calculated.

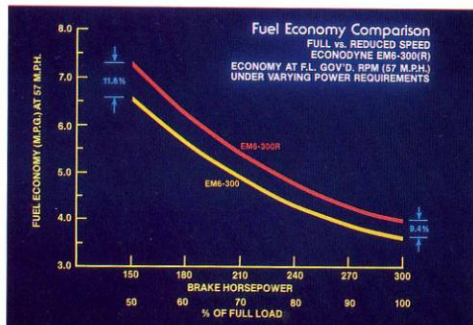


Fig. 29

This graph shows how the MPG of fuel consumed varies with load in the reduced-speed and in the full-speed engine for the specified conditions. The MPG economy of the EM6-300R is always appreciably superior to the full-speed engine, ranging from 9.4% better at full load to over 11.6% at half load.

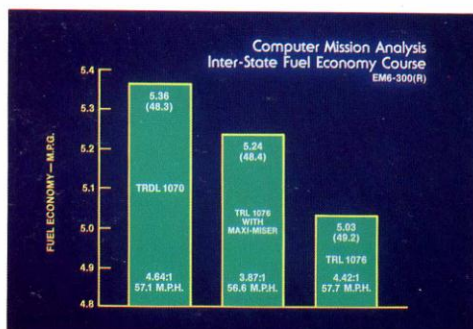


Fig. 30

As an alternate to the reduced-speed engine, 10-speed transmission combination, the Maxi-Miser® governor in conjunction with a full-speed Maxidyne and five- or six-speed transmission can be used. However, using the Maxi-Miser® to lower engine speed to 1800 RPM reduces fuel consumption only as long as a vehicle is driven in fifth gear. Shifting to a lower gear places the vehicle back in the high fuel consumption area. Based on the Mack mission analysis computer simulation of an interstate fuel economy test course, the overall fuel economy for the EM6-300R with the 10-speed transmission (TRDL1070) is 5.36 MPG, and for the EM6-300 with the five-speed transmission (TRL1076) with Maxi-Miser is 5.24 MPG. Without the Maxi-Miser, the full-speed engine with five-speed transmission delivers 5.03 MPG. The economy advantage of the reduced-speed engine is significant. At a fuel cost

of \$1.20 per gallon, in 100,000 miles, the EM6-300R with 10-speed transmission saves at least \$500 over the five-speed transmission with Maxi-Miser, nearly \$1500 over the EM6-300/five-speed combination alone.

Startability
EM6-300(R) WITH VARIOUS TRANSMISSIONS

ENGINE MODEL	FULL LOAD GOVERNED ENG. SPEED	TRANSMISSION	REAR AXLE RATIO	FULL LOAD GOVERNED ROAD SPEED	OVER-ALL GEAR RATIO (STARTABILITY)
NO.	RPM	NO. OF SPEEDS	NO.	M.P.H.	NO.
EM6-300R	1700	10 SPEED OVER-DRIVE	4.84:1	59.7	39.9:1
EM6-300	2100	5 SPEED DIRECT	4.42:1	57.6	38.0:1
EM6-300	2100/1800*	5 SPEED DIRECT	3.87:1	56.4	33.2:1
EM6-300	2100/1800*	6 SPEED DIRECT	3.87:1	56.4	54.6:1

* MAXI-MISER

Fig. 31

We have established 1800 RPM for the standard Maxi-Miser setting as the best compromise between economy and startability when used with our six-cylinder engines and five-speed transmissions. Lowering the Maxi-Miser setting below 1800 RPM will not result in acceptable startability, even for on-highway use.

Minimum Over-all Ratios For Satisfactory Startability
(GCW's to 80,000 lb.)

MAXIMUM GRADE	MINIMUM OVER-ALL RATIO
10%	34:1
15%	41:1
18%	46:1

Fig. 32

This table shows overall ratios recommended for GCWs to 80,000 pounds. Where operating conditions may be more severe than normal...for example, when unpaved surfaces may be encountered...these ratios may need to be increased. Also, if frequent starts are required, clutch life will be extended when overall ratio is increased.



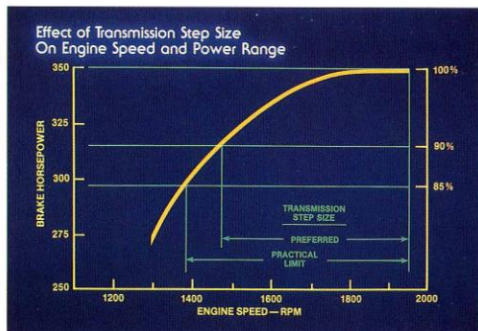


Fig. 33

When considering the step size in the transmissions that will yield satisfactory performance, the basic criterion to follow is: The engine power available immediately after making an up-shift should be at least 85% of that available at the full-load-governed speed. Much more desirable would be to drop only to 90% of the full-speed power, but some compromise from this level is frequently necessary.

ECONODYNE ENGINE MODEL	TRANSMISSION STEP SIZE		TRANSMISSIONS	
	PREFERRED		PRACTICAL	
	MIN. ENG. RPM	% STEP	MIN. ENG. RPM	% STEP
EM-250	1230	70		
EM-250R	1240	37		
EM-275R	1245	28		
EM-300	1230	70		
EM-300R	1240	35		
EM-350	1470	32	1385	40
EM-350R	1470	23	1390	29
EM-400	1200	70		
EM-400R	1250	36		
EM-440	1430	26	1320	35

Fig. 34

This table shows acceptable and preferred transmissions for Mack engines. In general, a five-speed transmission can always be used with a full-speed Maxidyne engine, and an 8-, 9- or 10-speed unit will give satisfactory performance with a reduced-speed Maxidyne. For conventional torque-rise engine models, a nine-speed will be acceptable with full-speed engines, but 10-speeds will always be required for reduced-speed versions.



Vehicle factors that can affect MPG

A Mack engine can give you up to a 10% basic fuel economy advantage over other manufacturers' comparable truck engines. But to do so, you must pay careful attention to all the little details that can make the difference between success and failure.

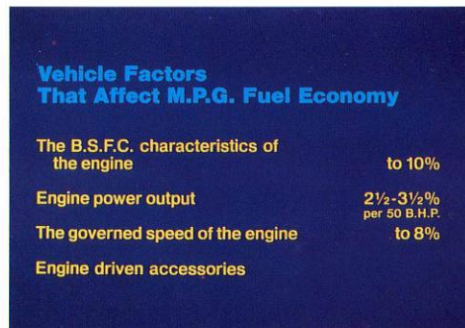


Fig. 35

Use of higher horsepower engines will reduce the MPG that can be obtained. The 2½% to 3½% numbers on the right hand side of the graph are the approximate effect on MPG of a 50-horsepower change in power. If you spec a 50-horsepower larger engine, you lose about 3% in road fuel economy and, of course, vice versa if you reduce power, a reduced governed engine speed will improve MPG performance. The difference between a full-speed engine and a reduced-speed engine can amount to as much as 8%.

Power steering, air conditioning and other engine-driven accessories, many of which are controlled by the operator, use power that would otherwise go into moving the vehicle and naturally result in poorer MPG performance. To minimize parasitic power loss, Mack includes temperature-responsive viscous drive fans as standard on all engines.

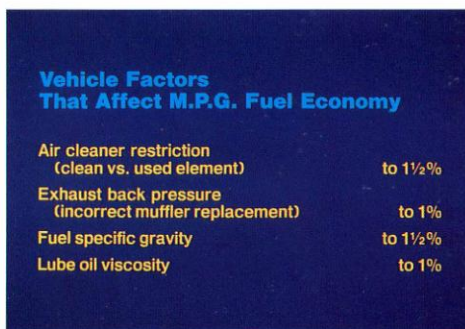


Fig. 36

Here are a number of factors associated with the engine that can have an influence on mileage of approximately 1% each. A new air cleaner element can make up to 1½% MPG improvement. Installing an incorrect replacement muffler with high exhaust back pressure can penalize fuel economy up to 1%.

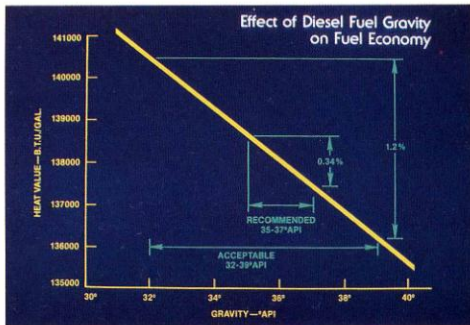


Fig. 37

Another item that is seldom given consideration is the specific gravity or density of the fuel. This again is hard to control, but you could end up with a 1.2% fuel economy penalty if, for example, your vehicle were fueled with a light 39API gravity fuel as against a 32API gravity fuel. Although both are within Mack's published acceptable range, it is recommended that the API of the fuel used be restricted to 35 to 37API. Variations in lube oil viscosity and other characteristics can have an up to 1% effect on MPG.

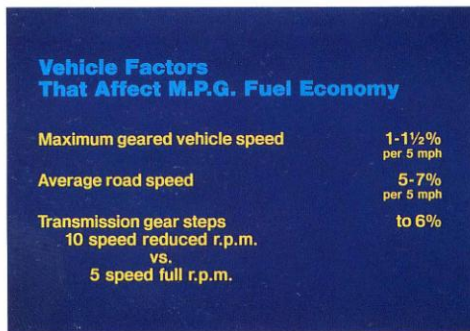


Fig. 38

Maximum geared vehicle speed changes of 5 MPH will cause direct changes of 1% to 1½% in road fuel economy. Even more important is average road speed. If you want average trip speed to be increased 5 MPH, you can expect a 5% to 7% deterioration in MPG.

The use of a five-speed transmission with a 2100 RPM engine as opposed to a reduced RPM engine with a 10-speed gear box will result in up to a 6% reduction in MPG.

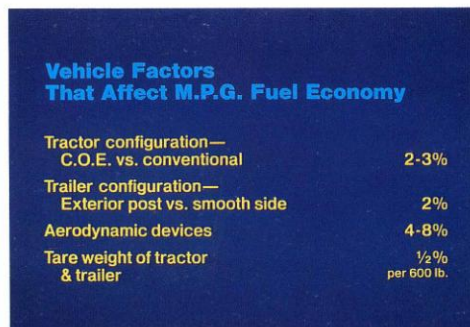


Fig. 39

The first three items shown here relate to the tractor and trailer factors that affect wind resistance while the last one affects rolling and grade resistance.

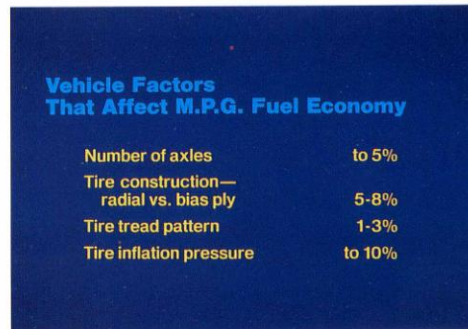


Fig. 40

All of the items on this chart are related to factors that have an effect on rolling resistance and some of these are quite substantial.

The most fuel efficient engine may not achieve the best over-the-road fuel economy. It is essential that consideration be given to the many factors that influence MPG performance.

The maximum fuel economy benefits of the Econodyne engines are obtained from the reduced or low-governed-speed versions which must be used with 8-, 9- or 10-speed transmissions. However, Mack engines are available in full speed versions, in which case we encourage the use of Mack Maxi-Miser governor. The dual-speed Maxi-Miser will limit the V-8 engine to 1700 or the six-cylinder to 1800 RPM when the transmission is in its top gear, yet allow maximum RPM in all other gears. This will permit those who greatly prefer a five- or six-speed transmission to trade off fuel economy in exchange for the simplicity, ruggedness and ease of handling that is inherent in the five- and six-speed Maxitorque gear box.

In summary, the main considerations that must be evaluated to achieve the ultimate in fuel efficiency combined with satisfactory performance are these:

1. Limit the top speed of the vehicle.
2. Use an engine that has enough horsepower to do the job, but no more than needed.
3. Use reduced-speed engines.
4. Provide enough speeds in the transmission to give satisfactory performance.
5. Make sure there is enough overall ratio for startability under all operating conditions.

The new Econodyne engines are available only in models that accumulate high annual mileage... those models normally associated with inter-city highway operations. We will continue to furnish our fuel-efficient engine-mounted charge-air cooling in models typically used for construction, refuse collection, and intra-city pick-up and delivery where the annual mileage is comparatively low.

The mature basic design of the Mack engine has proven to be reliable and durable in years of operation under the most rugged conditions heavy-duty trucks can encounter. The Mack Econodyne engines are the current successors to this outstanding heritage.



ENGINE SPECIFICATIONS

	Number of Cylinders	Piston Displacement In. ³ (Liters)	Bore & Stroke In. (mm)	Compression Ratio	Peak Gross HP (kW)	Governed RPM	Max. Torque Lb.-Ft. (N•m) @ RPM
*EM6-250	6	672(11.0)	4 $\frac{1}{8}$ x 6 (124 x 152)	15:1	250(187)	2100	940(1274) @ 1260
EM6-250R	6	672(11.0)	4 $\frac{1}{8}$ x 6 (124 x 152)	15:1	250(187)	1700	940(1274) @ 1260
EM6-275R	6	672(11.0)	4 $\frac{1}{8}$ x 6 (124 x 152)	15:1	275(205)	1600	1038(1407) @ 1260
*EM6-300	6	672(11.0)	4 $\frac{1}{8}$ x 6 (124 x 152)	15:1	300(224)	2100	1125(1525) @ 1260
EM6-300R	6	672(11.0)	4 $\frac{1}{8}$ x 6 (124 x 152)	15:1	300(224)	1700	1125(1525) @ 1260
E6-350	6	672(11.0)	4 $\frac{1}{8}$ x 6 (124 x 152)	15:1	350(261)	1950	1131(1533) @ 1400
E6-350R	6	672(11.0)	4 $\frac{1}{8}$ x 6 (124 x 152)	15:1	350(261)	1800	1131(1533) @ 1400
*EM(C)9-400	8	998(16.4)	5 $\frac{1}{8}$ x 5 $\frac{1}{2}$ (137 x 140)	17:1	400(298)	2100	1520(2061) @ 1230
EM(C)9-400R	8	998(16.4)	5 $\frac{1}{8}$ x 5 $\frac{1}{2}$ (137 x 140)	17:1	400(298)	1700	1520(2061) @ 1230
E9-440	8	998(16.4)	5 $\frac{1}{8}$ x 5 $\frac{1}{2}$ (137 x 140)	17:1	440(328)	1800	1495(2027) @ 1350

(C)—CALIFORNIA CERTIFIED

* —MAXI-MISER ROAD SPEED GOVERNOR RECOMMENDED TO REDUCE RPM TO 1800
AT TOP GEAR FOR OPTIMUM 5- AND 6-SPEED TRANSMISSION OPERATING EFFICIENCY.

Parts and Service throughout North America

When you buy a Mack truck, you invest in a lifetime of excellent service. Because Mack understands that getting fast, reliable service when you need it makes a big difference in your earning power.

Over 800 Mack Sales, Parts and Service Centers around the nation and in Canada stand ready to meet your needs. They're staffed with trained professionals—the kind of people who can take care of any truck.

Mack is dedicated to quality when it comes to your truck...built-in quality that traditionally commands higher re-sale value after years of satisfactory performance.



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