

# MAC K ENGINE

## AI-400



### FEATURES

- Available in Granite (CV) and Granite Axle Back (CT) Models only
- High Torque ECONODYNE™ Diesel Engine
- Internal Exhaust Gas Recirculation (IEGR)
- Maximum Horsepower 400 BHP [298 kW]
- Electronic Unit Pump Fuel Injection with Rate Shaping
- V-MAC III Total Vehicle Electronics System
- Wide Operating Range 1300-1950 RPM
- Chassis Mounted Charge Air Cooled
- 52 Quart Oil Pan
- Mack PowerLeash™ Engine Brake
- MR with 36 Quart Oil Pan
- CT and CV7 with 51 Quart Oil Pan

### SPECIFICATIONS

HP [kW] @ Governed RPM ..... 400 [298] @ 1950  
 Peak HP (kW) @ RPM ..... 400 [298] @ 1600-1950  
 Max. Torque lb. ft. [N•m] @ RPM ..... 1,360 [1 843] @ 1300

Type ..... Direct Injection Diesel  
 Number of Cylinders ..... 6, In-Line  
 Bore & Stroke, in. [mm] ..... 4.875 x 6.5 [124 x 165]  
 Displacement, in.<sup>3</sup> [L] ..... 728 [12]  
 Compression Ratio ..... 16:1  
 Firing Order ..... 1-5-3-6-2-4  
 Torque Rise ..... 26%  
 Clutch Engagement ..... 620 lb. ft. [840 N•m] @ 800 RPM  
 Idle Speeds:

Low ..... Adjustable; 650 RPM  
 High ..... Adjustable; 2100 RPM

Engine Brake Retarding Power (If Applicable)  
 ..... 335 HP [234 kW] @ 2100 RPM

Weight, Dry: (Approx.) w/36 Qt. Oil Pan . . . 2,210 lbs. [ 1 003 kg]  
 Weight, Dry: (Approx.) w/52 Qt. Oil Pan . . . 2,221 lbs. [ 1 010 kg]

(With air compressor, but no oil, water, starter, fan, alternator, or clutch)

### V-MAC III® FUNCTIONS

Electronic Vehicle Management and Control System  
**OVER 200 PROGRAMMABLE FEATURES**

#### V-MAC III ENGINE CONTROLS:

- |                           |                              |
|---------------------------|------------------------------|
| Electronic Fuel Control   | Programmable:                |
| Electronic Timing Control | — Governor Type              |
| “Smart Fan” Drive         | — Low Idle Speed             |
| Engine Brake Control      | — High Idle Speed            |
| Engine Protection         | — Electronic Torque Limiting |

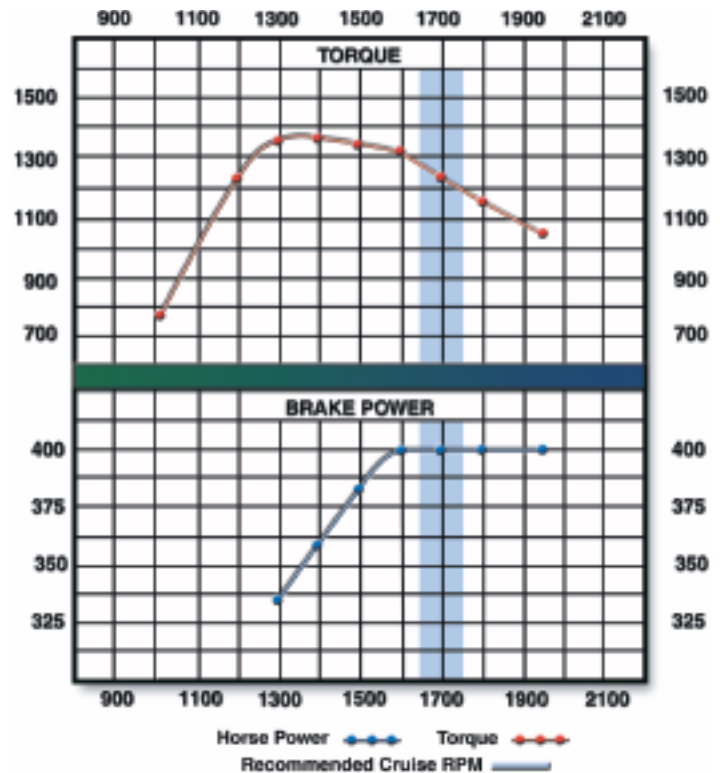
#### V-MAC III VEHICLE CONTROLS:

- |                                  |                           |
|----------------------------------|---------------------------|
| Vehicle Speed Control            | Idle Shutdown             |
| — Road Speed Limiting (RSL)      | Accessory Relay           |
| — Lower Gear RSL                 | Control                   |
| — Full Featured Cruise Control   | Security Controls         |
| Engine Speed Control             | — MPH Sensor Tamper       |
| — Electronic Hand Throttle (EHT) | Resistance                |
| — Multiple PTO Control           | — Engine Sleep Mode       |
| IDLE COOLDOWN                    | — Theft Deterrence (Opt.) |

#### V-MAC III ADDITIONAL FEATURES/AND DATA MAX:

- |                         |                                       |
|-------------------------|---------------------------------------|
| DataMax Trip Recorder   | Service Features                      |
| — Trip/Life Recorder    | — Integrated Diagnostics              |
| — Driver Event Log      | — Password Protection                 |
| — Histograms            | — Field Programmable Software         |
| — Incident Log          | — Maintenance Monitor                 |
| VIP DASH DISPLAY (Opt.) | — GuardDog Maintenance Monitor (Opt.) |
| Serial Communications   |                                       |
| — J1587                 |                                       |
| — J1939 (CAN)           |                                       |

### ENGINE PERFORMANCE



**ENGINE SPECIFICATIONS**

- Flywheel Housing . . . . . Aluminum
- Cylinder Block:
  - Material . . . . . Alloyed Grey Cast Iron
  - Bores . . . . . Torque Plate Honed
- Cylinder Liners:
  - Type . . . . . Wet/Dry (Replaceable)
  - Surface Finish . . . . . Peak Honed
- Cylinder Head Assembly:
  - Type . . . . . 3 Cyls/Head (2 Heads)
  - Configuration . . . . . 4 Valves/Cyl., OHV
  - Valve Type . . . . . Poppet w/Positive Rotators
  - Valve/Insert Material . . . . . Super Alloy (Serviceable)
- Pistons & Rings:
  - Piston Type . . . . . 2 Piece Articulated, Re-entrant Cavity
  - Piston Material . . . . . Alloy Steel Crown, Aluminum Skirt
  - Pin Diameter . . . . . 2.25" [57 mm]
  - Rings . . . . . 2 Compression, 1 Oil Control
- Crankshaft:
  - Material . . . . . Forged, Carbon Steel
  - Heat Treatment . . . . . Induction-Hardened Journals/Fillets
  - Main Bearing Diameter . . . . . 4.5" [114 mm]
  - Rod Bearings . . . . . Deltawall, 3.25" [83 mm] Diameter
- Valve Lifters . . . . . Ceramic Roller/Follower  
w/Hardened Steel Pin
- Charge Air Cooling . . . . . Chassis Mounted, Air-To-Air
- Fuel System:
  - Electronic Unit Pump . . . . . Bosch PLD 20  
with Rate Shaping
  - Injection Nozzles . . . . . Bosch VCO, 22 mm  
No leakoff, Centered Holder
  - Supply Pump . . . . . Bosch, Gear Type
  - Filter . . . . . Spin On, Disposable Primary and Secondary
- Lubrication System:
  - Type . . . . . Full Pressure, Wet Sump
  - Oil Filters . . . . . 2 Spin-On Full Flow Disposable,  
1 Centri-Max *Ultra* Centrifugal
  - MR Total Oil Capacity . . . . . 40 qts. [37.8 L] (Incl's. Filters)
  - CT/CV7 Total Oil Capacity . . . . . 55 qts. [52 L] (Incl's. Filters)
- Drain Plug . . . . . Magnetic
- Cooling System:
  - Capacity . . . . . 13 qts. [12.3 L]
  - Thermostats . . . . . Twin, wax element barrel  
type 180°F [82°C] opening
  - Hose Material . . . . . Gates Blue Stripe
- Air Compressor:
  - Type . . . . . Meritor WABCO
  - Standard Capacity . . . . . 18.7 cfm [8.9L/s]
- Turbocharger . . . . . Borg Warner S300
- Accessory Belt . . . . . 10 Rib, Poly-V

**GEARING RECOMMENDATIONS**

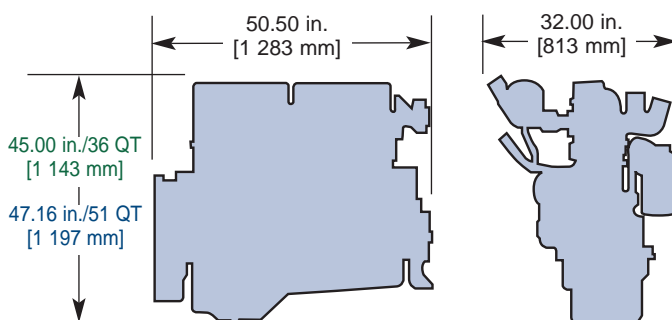
Proper gearing is necessary to achieve optimum vehicle performance and fuel economy. Vehicle specifications, including engine, transmission, axle ratio, and tire selection, should generally be selected to meet the following criteria:

<b>Startability</b>	Highway Applications . . . . .	≥ 10%
	On-Off Highway Applications . . . . .	≥ 16%
<b>Gradeability</b>	@ Cruise Max. MPH . . . . .	≥ 0.5%
	@ Peak Torque, Top Gear . . . . .	≥ 1.5%
<b>Cruise RPM</b>		1700 ± 50 RPM*

\*Cruise RPM = Engine speed in top gear @ Cruise Max. MPH setting. Limited to 65 MPH. At higher speeds gear truck to obtain above RPM @ 65 MPH.

Refer to the MACKTRAQ® electronic sales tool to obtain startability, gradeability and cruise RPM results for specific vehicle specifications. Special service applications, road surfaces, high GCW's or other factors may require different gearing considerations.

**DIMENSIONS**



**OIL/FILTER SERVICE INTERVALS**

Refer to the latest version of Mack Maintenance & Lubrication Manual TS494.

**OPTIONAL EQUIPMENT\***

- Higher Capacity Air Compressor available.
- Ether Injection Cold Start Systems
- Engine Block Heater (120 or 240 volts)
- Viscous & On-Off Fan Drive Options
- Iron Flywheel Housing
- High Capacity Alternators
- Fuel Heaters/Fuel-Water Separators

\* Availability may be chassis model dependent.