BULLETIN 1034 (1-67)

HIGH-TORQUE HORSEPOWER

MINNEAPOLIS MOLINE
POWER UNITS

MM

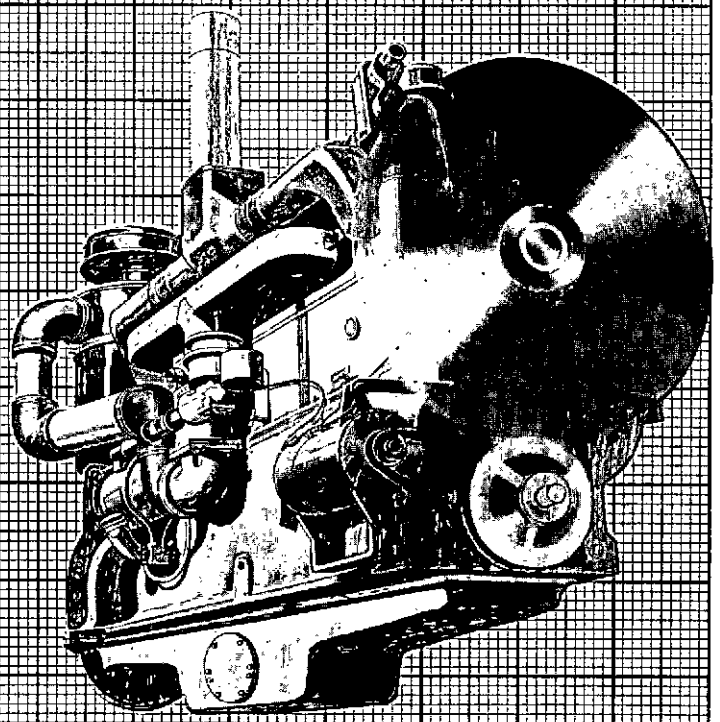
→ DIESEL ENGINES

→ LP GAS ENGINES

→ NATURAL GAS ENGINES

→ GASOLINE ENGINES

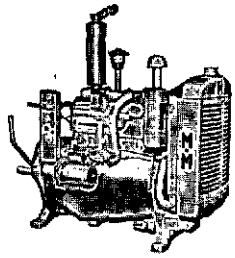
→ POWER UNITS



→ MORE HOURS OF POWER—MORE YEARS OF WORK

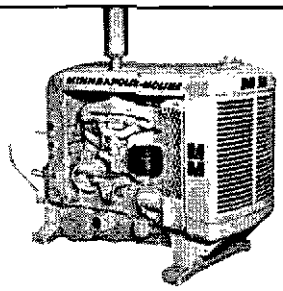
FOR CONTINUOUS DUTY

with minimum cost, downtime, maintenance!



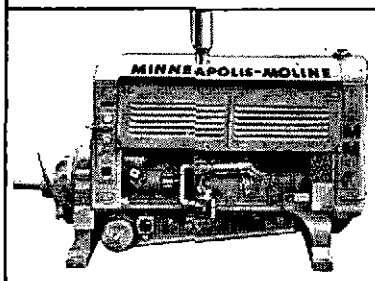
HD 220-4A POWER UNIT

Type.....4 cyl. valve in head
Bore.....3¾ in.
Stroke.....5 in.
Engine displacement.....220 cu. in.
Approx. weight.....1120 lbs.



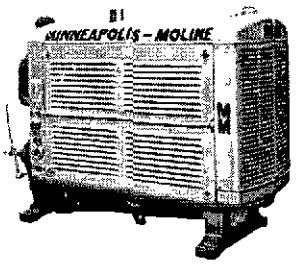
336A-4A POWER UNIT

Type.....4 cyl. valve in head
Bore.....4⅝ in.
Stroke.....5 in.
Engine displacement.....336 cu. in.
Approx. weight.....1180 lbs.



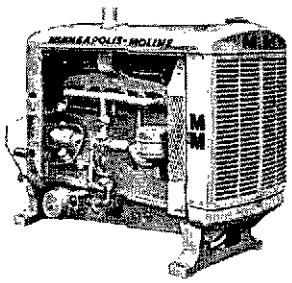
425A-6A POWER UNIT

Type.....6 cyl. valve in head
Bore.....4¼ in.
Stroke.....5 in.
Engine displacement....425.5 cu. in.
Approx. weight.....2150 lbs.



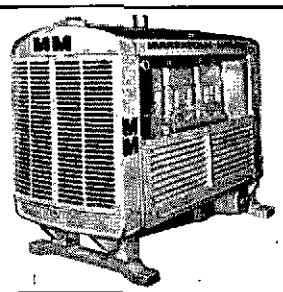
HD 504A-6A POWER UNIT

Type.....6 cyl. valve in head
Bore.....4⅝ in.
Stroke.....5 in.
Engine displacement.....504 cu. in.
Approx. weight.....2400 lbs.



605B-6A POWER UNIT

Type.....6 cyl. valve in head
Bore.....4⅝ in.
Stroke.....6 in.
Engine displacement.....605 cu. in.
Approx. weight.....2550 lbs.



HD 800-6A POWER UNIT

Type.....6 cyl. valve in head
Bore.....5-5/16 in.
Stroke.....6 in.
Engine displacement.....800 cu. in.
Approx. weight.....2900 lbs.

MINNEAPOLIS–MOLINE ENGINES AND POWER UNITS

Heavy-duty, work-type design based on standardized high production parts results in low initial cost and low upkeep.

Extensive Minneapolis-Moline oil *field experience is embodied in* this line of dependable units built to withstand peak stresses in pumping operations.

- **Built for 24 hour-a-day duty.**
- **High turbulence combustion chambers.**
- **Direct cooling—water flows to hottest points first.**
- **Cylinder head and block *are easily removed by one* man without a hoist.**
- **High compression ratios.**
- **Heavy flywheel housing flange prevents distortion on shock loads.**

Each unit is available stripped, with partial equipment, or completely enclosed to fit the job application at hand. Minneapolis-Moline engines are larger and weigh more than most other engines in their hp class. Minneapolis-Moline units rely on ample displacement at low rpm for their hp and maintain that hp and rpm under load.

HEAT EXCHANGER BASE PAN (optional) is cast with water jackets to maintain oil temperature in the crankcase very close to the water temperature at the engine outlet manifold. This absolute temperature control reduces sludge contamination and increases time between oil changes. It prolongs engine life even under severe climatic conditions.

HEAT EXCHANGER EXPANSION TANK (optional). This gravity reservoir installation maintains a completely filled cooling system when a cooling coil is used in place of a conventional radiator.

HORSEPOWER AND SPEED RATINGS

CARBURETED UNITS		MAXIMUM BHP @ SPEEDS INDICATED														
MODEL	FUEL	MAX. TORQUE	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
HD220-4A	LPG	***208 @ 1000**	**31**	**35**	**39**	**43**	**47**	**51**	**55**	**58**	**61**	**63**	**66**	**68**	**70**
		202 @ 1000	30	33	37	41	45	49	53	55	58	60	62	62	63
	NG	***187 @ 1200**	**28**	**32**	**36**	**39**	**43**	**46**	**49**	**52**	**55**	**57**	**60**	**62**	**64**
		181 @ 1200	27	30	34	37	41	44	47	49	52	54	56	56	57
	GASO	***203 @ 1400**	**29**	**33**	**38**	**42**	**46**	**50**	**54**	**57**	**61**	**63**	**66**	**68**	**70**
		196 @ 1200	28	31	36	40	44	48	52	54	58	60	62	62	63
336A-4A	LPG	***314 @ 1000**	**46**	**53**	**60**	**66**	**71**	**76**	**80**	**84**	**88**	**91**	**93**		
		285 @ 1000	44	50	57	62	66	71	74	77	80	82	83		
	NG	***288 @ 1200**	**42**	**48**	**54**	**60**	**66**	**71**	**76**	**81**	**85**	**88**	**91**		
		263 @ 1100	40	45	51	55	61	66	70	74	77	79	81		
	GASO	***309 @ 1000**	**46**	**53**	**60**	**66**	**71**	**76**	**80**	**84**	**88**	**91**	**93**		
		295 @ 1000	44	50	57	62	66	71	74	77	80	82	83		
425A-6A	LPG	***338 @ 800**	**52**	**58**	**64**	**71**	**76**	**82**	**89**	**94**	**99**				
		327 @ 800	50	56	61	68	72	77	82	87	91				
	NG	***308 @ 800**	**47**	**53**	**59**	**64**	**70**	**75**	**80**	**85**	**91**				
		297 @ 800	45	51	56	61	65	70	74	78	82				
	GASO	***344 @ 1000**	**52**	**59**	**65**	**72**	**78**	**84**	**91**	**96**	**101**				
		332 @ 900	50	57	62	69	74	79	84	89	93				
HD504A-6A	LPG	***422 @ 1000**	**63**	**72**	**80**	**89**	**96**	**102**	**110**	**116**	**123**	**130**	**136**	**141**	**146**
		396 @ 900	60	69	76	82	90	95	101	107	112	115	119	122	124
	NG	***400 @ 1000**	**60**	**69**	**76**	**84**	**91**	**98**	**104**	**112**	**118**	**124**	**129**	**134**	**138**
		377 @ 900	57	66	72	78	84	91	96	101	106	110	113	115	116
605B-6A	LPG	***556 @ 900**	**85**	**96**	**106**	**117**	**127**	**137**	**145**	**152**	**160**				
		540 @ 800	82	92	101	111	120	129	135	140	146				
	NG	***532 @ 1000**	**80**	**90**	**100**	**110**	**120**	**129**	**138**	**145**	**152**				
		505 @ 800	77	86	95	104	113	121	128	133	138				
HD 800-6A	LPG	***718 @ 1100**	**107**	**120**	**135**	**145**	**162**	**175**	**187**	**200**	**211**	**221**	**231**	**240**	**250**
		671 @ 1100	100	112	126	138	151	163	174	186	196	204	212	218	226
	NG	***676 @ 1000**	**101**	**114**	**128**	**143**	**156**	**169**	**180**	**194**	**205**	**216**	**225**	**233**	**240**
		630 @ 1100	94	106	119	133	145	157	167	180	190	199	206	211	216
DIESEL UNITS															
D336A-4A		***289 @ 1200**	**40**	**48**	**55**	**61**	**67**	**72**	**76**	**79**	**82**				
		265 @ 1100	38	45	52	57	62	67	70	72	74				
D425-6A		***298 @ 1200**	**43**	**50**	**56**	**62**	**69**	**74**	**79**	**84**	**89**				
		280 @ 1100	41	47	53	59	64	69	73	77	80				
DHD504-6A		***424 @ 1200**	**62**	**71**	**80**	**88**	**97**	**105**	**112**	**119**	**126**	**133**	**138**		
		400 @ 1000	59	68	76	81	91	98	103	110	115	118	121		

***BOLD FIGURES:** for industrial stripped engines . . . Light figures: for completely equipped power units. The maximum horsepowers shown were obtained on a dynamometer test and were corrected to standard conditions of 29.92 inches barometer and 60°F. air temperature. Figures to the left of the bar are for engines operating with continuous load.

Note: when selecting an engine to meet specific load requirements, be sure to make allowances for all belt, gear, or other power losses between the engine and the final required output.

Minneapolis-Moline is constantly striving to improve its products and therefore reserves the right to change design, materials, and specifications without notice.

MINNEAPOLIS-MOLINE® MM *Long Life Engines*

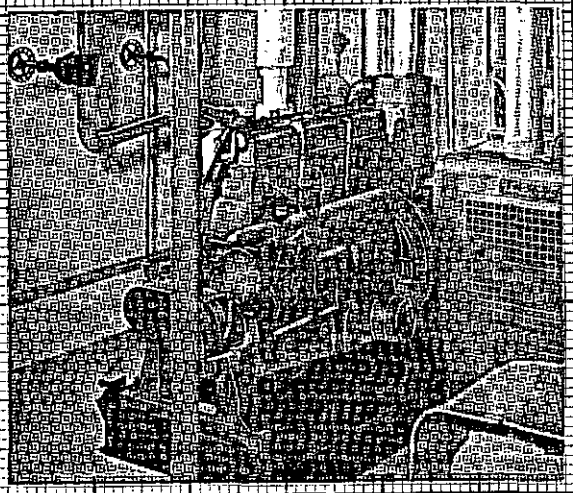
MINNEAPOLIS-MOLINE, INC., Hopkins, Minnesota · A Subsidiary of WHITE MOTOR CORPORATION

MINNEAPOLIS-MOLINE

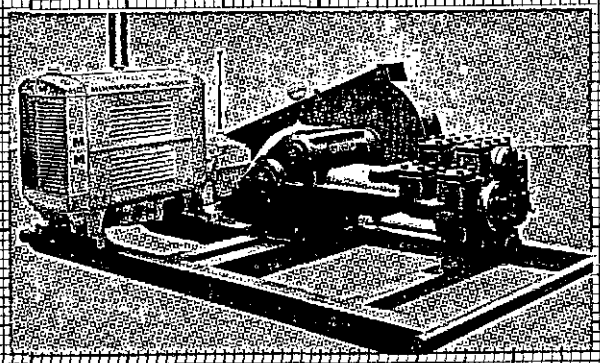
INDUSTRIAL POWER UNITS

GENERAL APPLICATIONS

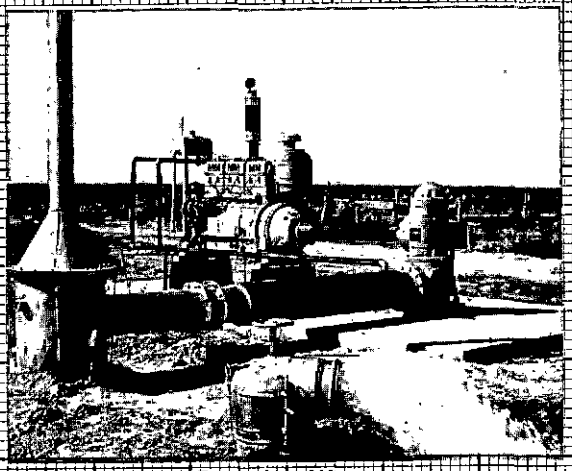
COMPRESSORS
CONVEYORS
COTTON GINS
CRANES
CRUSHERS
DITCHERS
DRILL RIGS
DRAGLINES
FEED MILLS
GENERATORS
GRADERS
HOISTS
MARINE ENGINES
MATERIAL SPREADERS
MIXING PLANTS
POWER SHOVELS
PUMPS
PULVERIZERS
ROTARY PLOWS
ROCK AND GRAVEL PLANTS
SAW MILLS
TRENCHERS
WINCHES



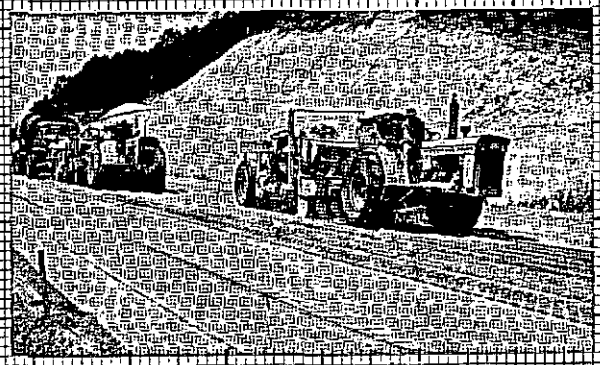
Peak Shaving



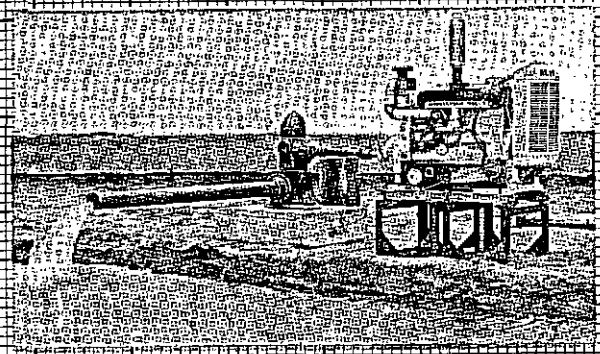
Plunger Pumps



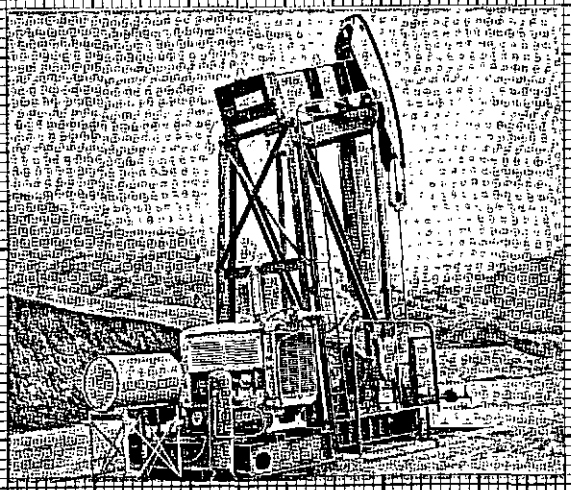
Pumping Water



Road Construction—Soil Cement



Irrigation



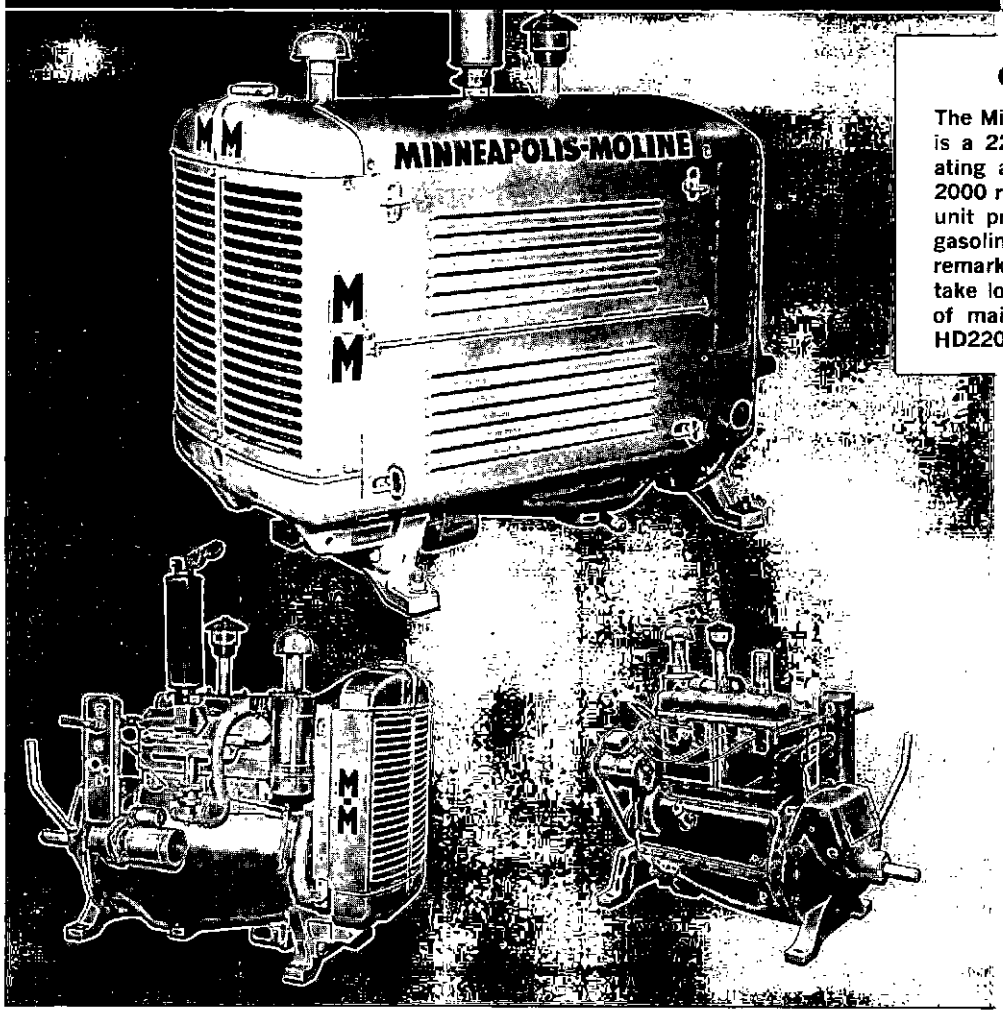
Air Balance Pumping Unit

FIT JOB REQUIREMENTS...EASY TO SERVICE

MINNEAPOLIS-MOLINE

Specifications Bulletin 1022 (3-67)

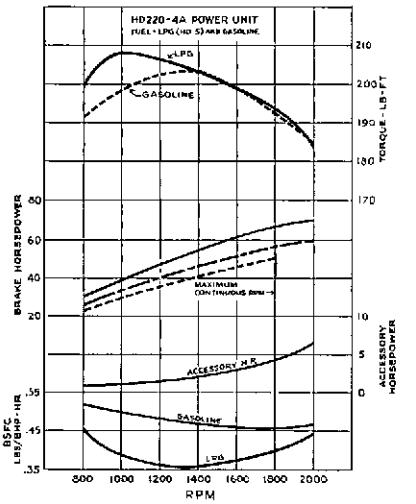
HD220-4A
INDUSTRIAL POWER UNIT



GENERAL DESCRIPTION

The Minneapolis-Moline HD220-4A Power Unit is a 220 cubic inch engine capable of operating at 1800 rpm on continuous duty and 2000 rpm intermittent duty. At 1800 rpm this unit produces 66 hp on LP gas and regular gasoline, and 60 hp on natural gas. This is a remarkably efficient, sturdy engine built to take long periods of service with a minimum of maintenance. Approximate weight of the HD220-4A basic power unit is 1000 lbs.

PERFORMANCE



FOR STRIPPED ENGINES:

——— Maximum Output— (29.92" Hg. & 60°F.)

— — — — Intermittent Rating

- - - - - - - - Continuous Rating

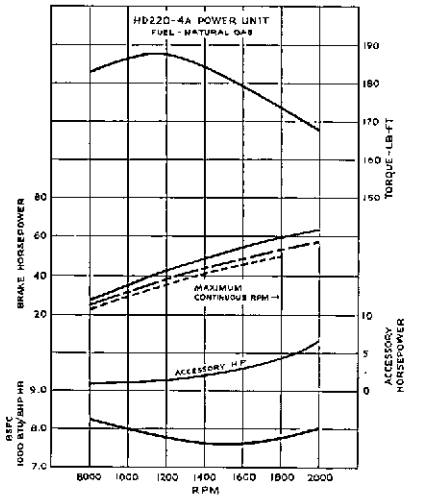
NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

NOTE: Natural Gas performance run with fuel HHV=1000 BTU/FT.^{3}; Fuel Consumption based on LHV=900 BTU/FT.^{3}.

LPG performance run with HD5 or equivalent quality. Gasoline performance run with regular grade fuel.



Economical Design—rigid heavy-ribbed crankcase helps maintain perfect alignment and smooth operation. Blocks and heads are cast in pairs . . . a Minneapolis-Moline exclusive.

Efficient Cooling—35 gallon per minute water pump circulates coolant to hottest part of engine first, to maintain even temperature.

High-Turbulence Combustion—as the fuel mixture is compressed in the cylinder, twin air-swirls are created—one on each side of the center of the aluminum piston. This turbulence results in more even burning and greater fuel economy.

Precision Bearings—Big crankshaft has extra large bearings to reduce bearing pressure to a minimum. Bearing surfaces are precision ground and polished to micro-accuracy.

STANDARD EQUIPMENT

- Water pump and oil pump
- Manifolds and carburetor
- Oil filter and governor
- Oil bath air cleaner
- Magneto spark plugs and cables
- Distributor spark plugs and cables
- Starting ring gear for flywheel
- Flywheel, fan drive pulley
- Name plate, lifting eye
- Muffler, thermostat
- Valve cover, filter type ventilation
- Safety switches — magneto ignition
- Safety switches — distributor ignition
- Magneto ignition — heavy duty — side mtd.
- Side mounted oil filter
- Fuel pump for gasoline
- Hoist controls
- Vacuum gauge

ADDITIONAL EQUIPMENT

(Factory installed only)

- Instrument panel and controls
- Std. gauges — oil and temp.
- Power unit legs front
- PTO clutch and clutch shaft. Rear legs included
- Radiator and fan. Includes pressure cap
- Inclosures
- High altitude heads for gasoline
- Fan guard
- Fuel tank 10 gallon for gasoline only
- Starting motor 12-volt
- Generator 12-volt
- Electric starting receptacle
- Nat. gas reg. and filter
- LPG vaporizer and filter

(Not factory installed)

- Battery cables
- SAE No. 4 flywheel housing
- Rear legs for No. 4 housing
- Heat exchanger expansion tank
- Tachometer
- Sight oil gauge
- Power Take Off. Consists of housing, clutch, and shaft

HD220-4A POWER UNIT

SPECIFICATIONS

GENERAL:
- Bore and stroke: 3¾ x 5 inches
- Number of cylinders: 4
- Piston displacement: 220 cubic inches
- RPM at piston speed of 1000 fpm: 1200
- Rotation, facing flywheel end: Counter-clockwise
- Compression ratio
  - Natural gas and LP gas: 9.8 to 1
  - Regular gasoline: 7.6 to 1

CRANKSHAFT:
- Material: Drop-forged steel, heat-treated
- Type: Counter-balanced
- Bearings
  - *Number*: 3
  - Size, front and center: 2¾ x 1⅝ inches
  - Rear: 3 x 2 3/16 inches
  - Type: Tri-Metal, precision-type

CONNECTING RODS:
- Material: Drop-forged steel, heat-treated
- Length, center-to-center: 9 inches
- Bearing size: 2⅝ diameter x 1¼ inches
- Type: Tri-metal, precision-type

CYLINDERS:
- Material: Cast iron
- Removable cylinder blocks: Cast in pairs

CYLINDER HEADS:
- Material: Cast iron
- Cast: In pairs

PISTON PINS:
- Size: 1-inch diameter
- Type: Full floating

PISTONS:
- Material: Aluminum
- Number of rings: 4
  - Compression: Two, 3/32 inches wide
  - Oil: Two, 5/32 inches wide

VALVES and VALVE MECHANISM:
- Location: In head
- Intake valves: Alloy steel, 1 15/32 inches dia.
- Exhaust valves: Alloy steel, 1⅜ inches dia.
- Valve seat: Stellite or equivalent, exhaust only
- Tappet Type: Barrel ported
  - Material: Chilled cast iron

CAMSHAFT:
- Material: Cast Proferall Metal
- Number of bearings: 3
- Drive: Helical gear

CRANK CASE:
- Type: One-piece barrel type
- Access: Through large side cover
- Ventilation: Filter on valve cover

OILING SYSTEM:
- Pump type: Submerged gear
- Pump capacity: 5¼ gpm at 30 psi
- Filter: Full flow, replaceable cartridge type
- Pressure points: Connecting rod and main bearings, Valve mechanism and timing gears
- Oil level gauge: Bayonet type
- Crankcase oil capacity: 7 quarts
- Pressure gauge: On instrument panel

GOVERNOR: Mounted on crankshaft, cam and roller

IGNITION:
- Distributor: Delco-Remy, 12-volt
- Spark Plugs: 18 mm

FUEL SYSTEM:
- Carburetor
  - Gasoline: 1¼-inch Marvel-Schebler
  - Natural gas or LP gas: 1¼-inch Ensign

COOLING SYSTEM:
- Pump, type: Centrifugal combined with fan
  - Drive: V-Fan belt
  - Capacity: 35 gpm
- Fan, size and type: 18-inch, 4-blade
  - Bearings: Ball bearings
- Radiator, capacity: 22 quarts
  - Construction: Core and header tube and fin and cast iron tank
- Temperature control: Thermostat
  - Indicators: On instrument panel

INSTRUMENT PANEL:
- Type: Completely enclosed
- Position: On either side of engine
- Instruments: Water Temperature Gauge, Oil Pressure Gauge, Hand Throttle, provision for Hour Meter, Ammeter, Starter Button and Switch, Oil Pressure Safety Cut-off Switch

ENCLOSURES:
- Material: Heavy pressed steel
- Side covers: Removable, hinged in center. Top may be folded down or bottom folded up and latched in position. No bolts or screws.

POWER TAKE-OFF:
- Clutch: Twin Disc, 10-inch over center
- Shaft: 1¾ diameter x 4 inches long, ⅜ x 3/16 inch keyway
- Clutch housing: Cast integral with mounting legs
- Clutch shaft bearing: Tapered roller
- Lubrication: Pressure gun
- Service: Large inspection plate

MISCELLANEOUS
- Muffler: Low resistance, vertical
- Air cleaner: Center tube, oil bath

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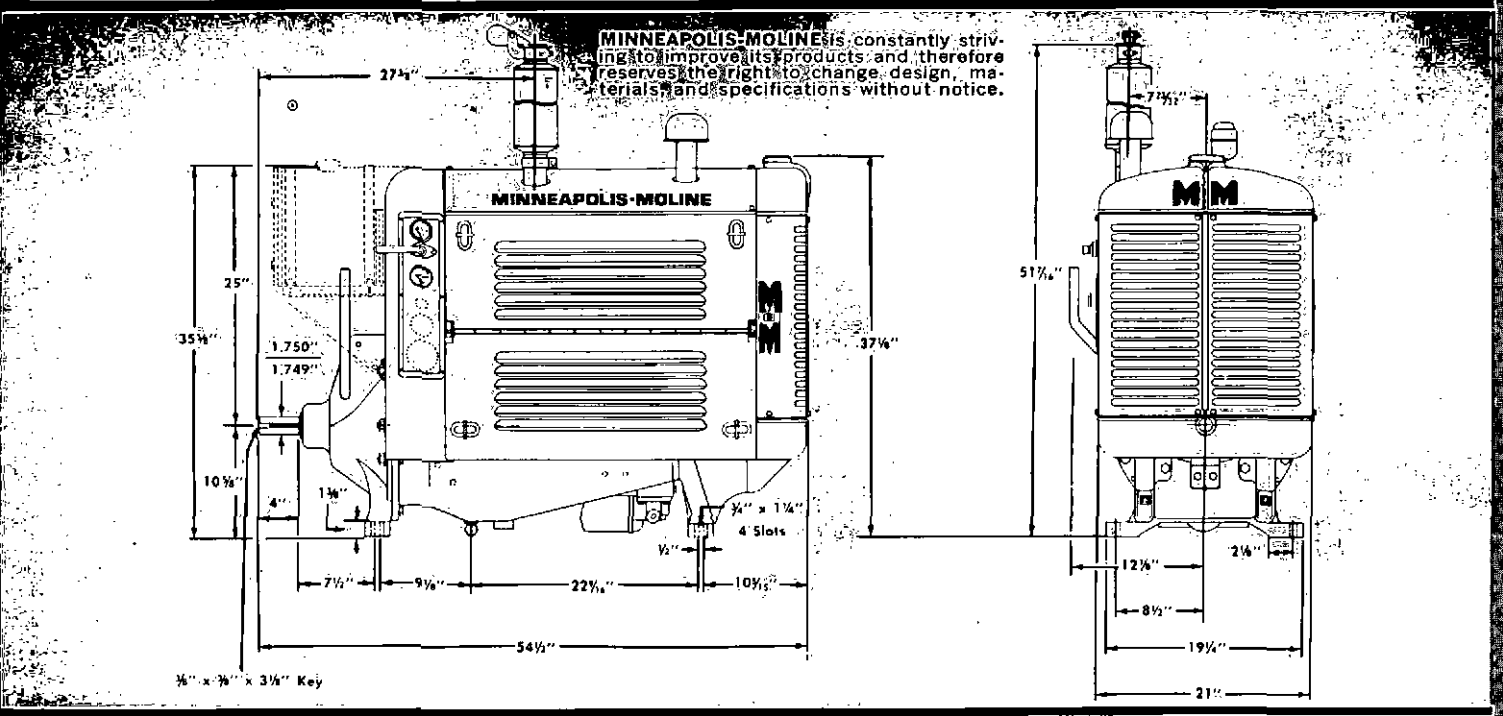


MINNEAPOLIS-MOLINE®

MM *Long Life Engines*

SOLD AND SERVICED BY:

MINNEAPOLIS-MOLINE, INC., Hopkins, Minnesota
A Subsidiary of WHITE MOTOR CORPORATION

5-64 Printed in U.S.A.

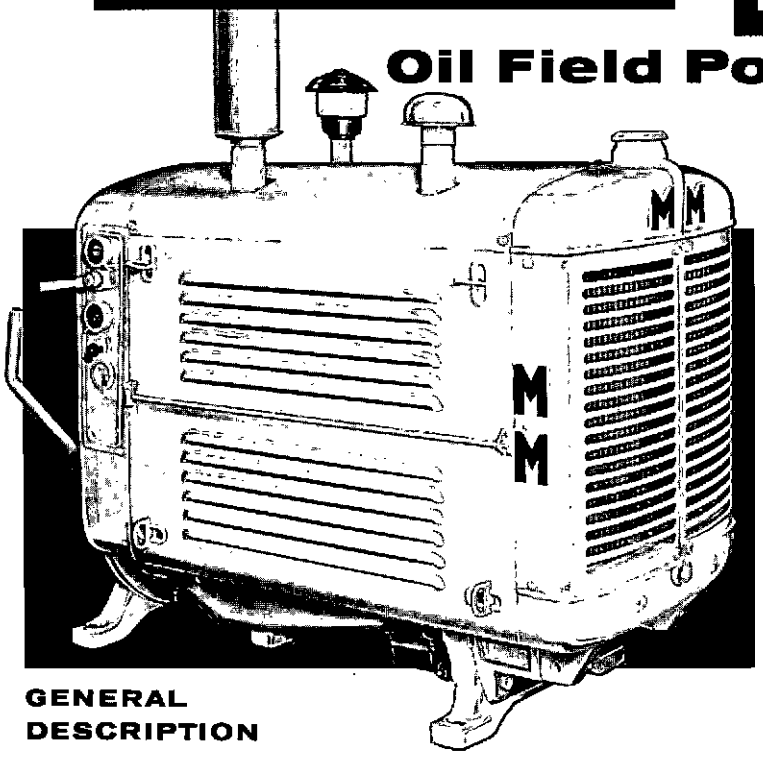
Bulletin 1021 (12-65)

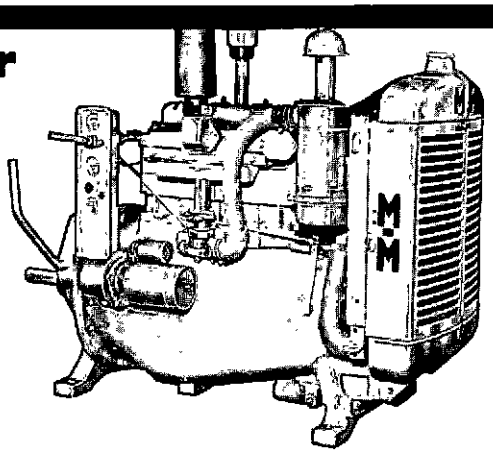
MINNEAPOLIS-MOLINE

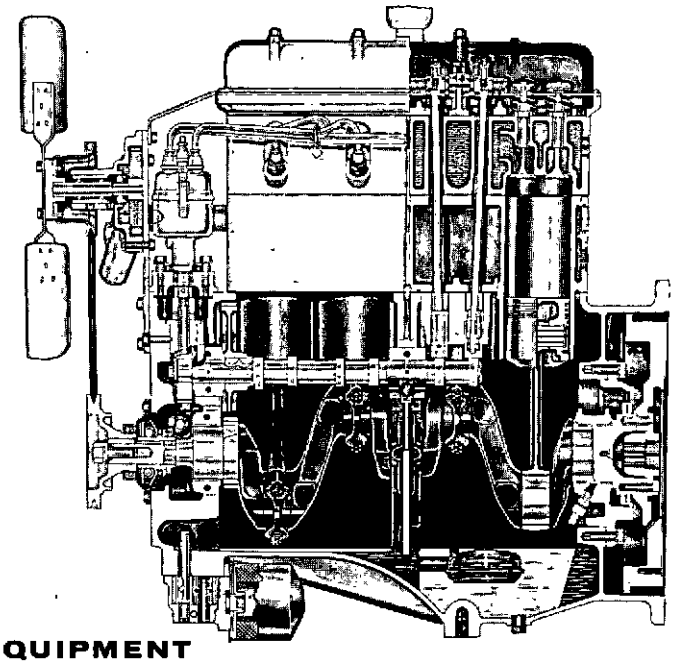
Model HD220-4A Natural Gas

POWER UNIT

Oil Field Power

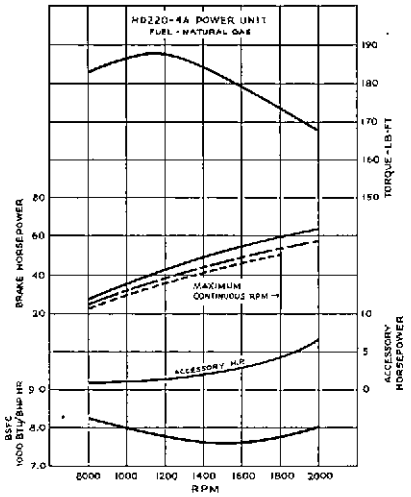






GENERAL DESCRIPTION

Type.....4 cylinder valve-in-head
Bore and stroke.....3¾ x 5 inches
Piston displacement.....220 cubic inches
Compression ratio.....9.8 to 1
Compression pressure — Cranking..210 psi
Rpm at piston speed of 1000 fpm....1200
Maximum hp at 1800 rpm (natural gas)..60
Approximate weight.....1100 lbs.



FOR STRIPPED ENGINES:

——————— Maximum Output— (29.92" Hg. & 60°F.)
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NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

NOTE: Natural Gas performance run with fuel HHV=1000 BTU/FT.³: Fuel Consumption based on LHV=900 BTU/FT.³.

STANDARD EQUIPMENT

Sheet metal enclosures
Folding side doors
Radiator with pressure cap
Fan assembly
Fan guard
Instrument panel and controls (standard location: right side, optional location: left side)
Vertical muffler with weather cap
Manifolds
Natural gas carburetor
Magneto ignition
Built-in governor
Spark plugs and cables
Power take-off
Twin disc clutch
Sight oil gauge
Leg base for front end
Oil pump and water pump
Oil pressure gauge
Water pump
Water temperature gauge
Thermostat
Oil bath air cleaner
Crankcase ventilation
Oil filter, full flow with bypass
Flywheel, fan drive pulley
Starter ring gear for flywheel
Lifting eye
Water temperature cutout (Murphy)
Oil pressure cutout (Murphy)
Exhaust valve seat inserts (Stellite)
Starting motor, 12 volt
Plug-in starting receptacle
Natural gas regulator and filter

Additional Equipment

Generator, 12-volt
Side-mounted oil filter
Battery cables
SAE No. 4 flywheel housing
Rear legs for No. 4 SAE housing
Heat exchanger · expansion tank
Tachometer and hour meter

Sold and Serviced by:

SPECIFICATIONS FOR MODEL HD220-4A NATURAL GAS POWER UNIT

GENERAL:
- Bore and stroke: 3¾ x 5 inches
- Number of cylinders: 4
- Piston displacement: 220 cu. in.
- Rpm at piston speed of 1000 fpm: 1200
- Rotation — facing flywheel end: ccw
- Approximate weight: 1100 lbs.
- Compression ratio (natural gas): 9.8:1
- Compression pressure — cranking: 210 psi

CRANKSHAFT:
- Material: Drop-forged steel, heat treated, counterbalanced
- Bearings —
  - Number: 3
  - Type: Tri-metal, precision type
  - Size —
    - Front and intermediate: 2¾" dia. x 1⅝"
    - Rear: 3" dia. x 2⁵⁄₁₆"

CYLINDERS:
- Material: Cast iron
- Removable cylinder blocks: Cast in pairs

CYLINDER HEADS:
- Cast: In pairs
- Material: Cast iron

CONNECTING RODS:
- Material: Drop-forged steel, heat treated
- Style: Forged in one-section
- Bearings —
  - Size: 2⅝" diameter x 1¼"
  - Type: Tri-metal, precision type

PISTONS:
- Material: Aluminum alloy
- Rings —
  - Number: 4
  - Compression: Two — ⅛" wide
  - Oil: Two — ⅛" wide
- Pins —
  - Type: Full floating
- Bearing (in rod) —
  - Size: 1" x 1⅝"
  - Material: Steel-backed, bronze lined

CAMSHAFT:
- Material: Cast Proferall metal
- Number of bearings: 3
- Drive: Helical gears

VALVES AND VALVE MECHANISM:
- Arrangement: In head
- Tappets —
  - Type: Barrel ported
  - Material: Chilled cast iron
- Intake valves —
  - Material and size: Alloy steel 1¹³⁄₃₂" dia.
- Exhaust valves —
  - Material and size: Alloy steel 1⅜" dia.
- Valve seat inserts (exhaust only): Stellite

IGNITION:
- Magneto: Side-mounted — heavy duty
- Spark plugs: 18 mm

OILING SYSTEM:
- Pump —
  - Type: Gear
  - Location: Submerged in sump
  - Capacity: 5¼ gpm at 30 psi
- Filter: Full flow, replaceable cartridge type
- Pressure points: Rod, main and camshaft bearings, timing gears, valve mechanism
- Crankcase capacity: 7 quarts
- Oil level gauge: Bayonet
- Pressure gauge: On instrument panel

CRANKCASE VENTILATION:
- Breather: Filter type

FUEL SYSTEM:
- Carburetor, Natural gas: 1¼" Ensign

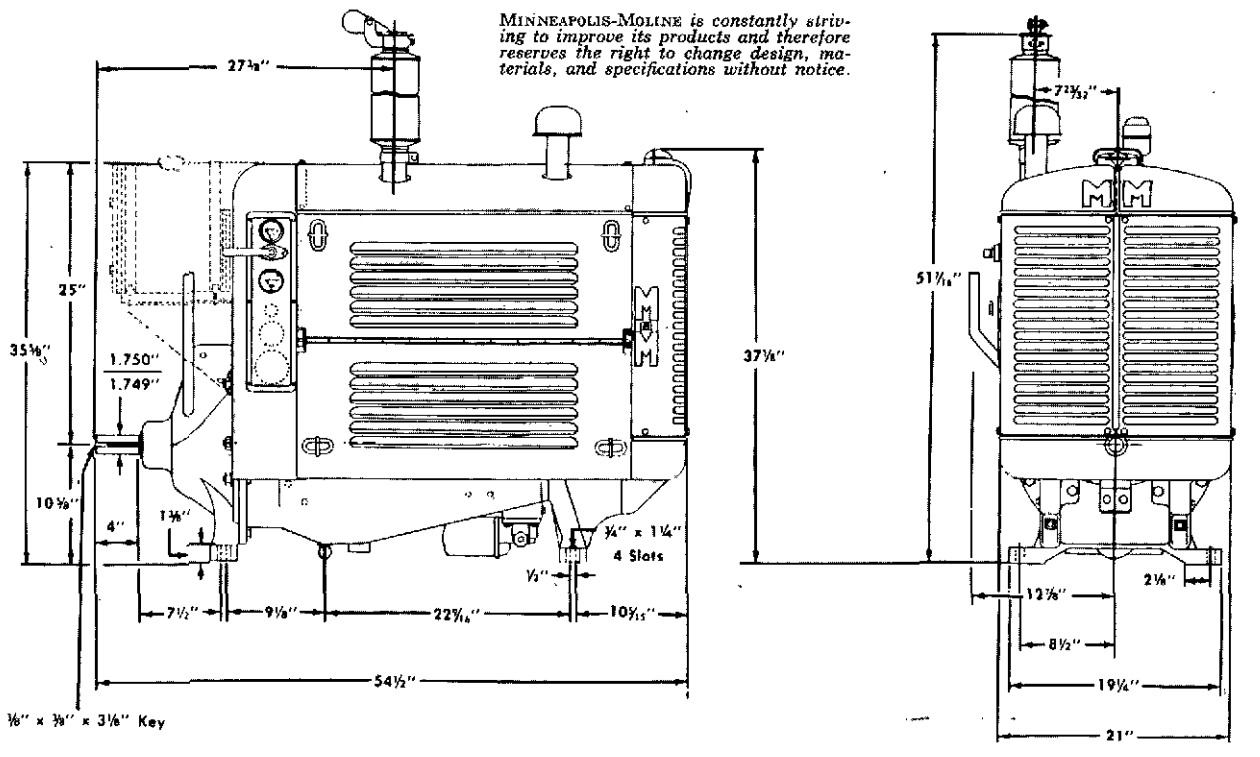
COOLING SYSTEM:
- Pump —
  - Type: Centrifugal
  - Drive: V-belt
  - Capacity: 35 gpm at 1800 rpm
- Fan —
  - Size: 18" diameter, 4-blade
  - Bearings: Ball bearing
  - Drive: V-belt
- Radiator —
  - Core: Tubular, lead-coated
  - Tanks: Cast iron top and bottom
  - Grille: Heavy punched steel
- Capacity: 22 quarts
- Water temperature control: Thermostat
- Temperature indicator: On instrument panel

POWER TAKE-OFF:
- Clutch: 10" Twin Disc
- Shaft: 4" long, 1¾" dia. with ⅜" x ¾₁₆" keyway
- Flywheel housing (optional): SAE No. 4 flange
- Power take-off: Inspection covers
- Outboard bearing: Two tapered roller bearings
- Pilot bearing: Single-row ball bearing
- Lubrication: Pressure gun to pilot, clutch throwout and outboard bearings
- Shifter lever: Can be mounted on either side of unit

INSTRUMENT PANEL:
- Panel: Enclosed and can be mounted on either side of unit
- Instruments: Water temperature gauge, oil pressure gauge, hand throttle control, provisions for starter button, ammeter, hour meter, and starting receptacle

ENCLOSURES:
- Hood: Formed of heavy gauge steel, and securely bolted in place
- Side covers: Heavy gauge steel, hinged at center and entirely removable. Top half may be folded down or bottom folded up and latched in position
- Rear cover: Reinforced heavy gauge steel

MINNEAPOLIS-MOLINE is constantly striving to improve its products and therefore reserves the right to change design, materials, and specifications without notice.



MINNEAPOLIS-MOLINE, INC.
Subsidiary of WHITE MOTOR CORPORATION
HOPKINS, MINNESOTA

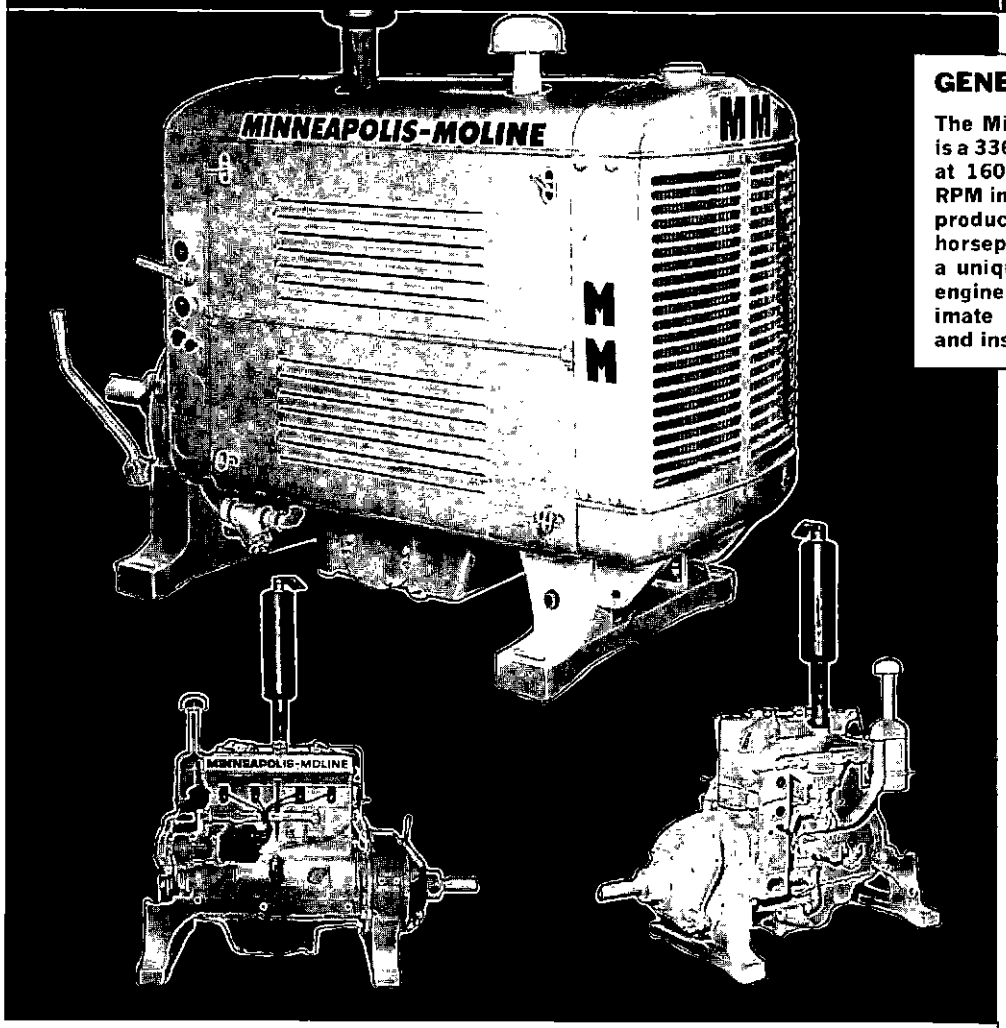
CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	HD220-4A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Standard Equipment			
	3-3/4 x 5 4-cylinder Moline engine. Flywheel and ring gear. Manifolds. Spark plugs and cables. Carburetor. Fan drive pulley. Water pump. Muffler. Oil pump. Thermostat. Oil filter. Valve cover. Oil bath air cleaner. Filter type ventilation Governor. Lifting eye. Magneto or distributor.			
	Basic Power Units — Comp. Ratio			
& 613112	HD220-4A BASIC POWER UNIT. Magneto - gasoline.....7.6:1	935.00	1000	.....
& 613122	HD220-4A BASIC POWER UNIT. Distributor - gasoline.....7.6:1	910.00	1000	.....
& 613412	HD220-4A BASIC POWER UNIT. Magneto - LP gas or natural gas.....9.8:1	945.00	1000	.....
& 613422	HD220-4A BASIC POWER UNIT. Distributor - LP gas or natural gas.....9.8:1	920.00	1000	.....
	NOTE: Basic unit does not include instrument panel, flywheel housing, power take-off, power unit legs, radiator and fan or inclosures. See Additional Equipment.			
	NOTE: Natural gas or LP gas units require a regulator or vaporizer to complete. See Additional Equipment.			
	Additional Equipment - Factory Installed Only			
& 690223	POWER UNIT LEGS. Front.....Add	9.50	30	.....
& 690323	INSTRUMENT PANEL AND CONTROLS. Less gauges. Requires 690320, 690321 or 690322.....Add	24.00	5	.....
690320	STANDARD GAUGES. Oil and temperature.....Add	9.25	1	.....
690321	SAFETY CUT-OUTS. (Murphy). Includes oil and temperature gauges. For magneto ignition.....Add	23.00	2	.....
690322	SAFETY CUT-OUTS. (Murphy). Includes oil and temperature gauges. For distributor ignition.....Add	35.25	2	.....
690141	VACUUM GAUGE. With shut-off valve. (Mounts on intake manifold).....Add	11.00	1	.....
& 690337	MECHANICAL TACHOMETER DRIVE PARTS. Less tachometer head. For magneto ignition.....Add	11.25	2	.....
& 690150	HOIST CONTROLS. For gasoline units with magneto ignition. Includes instrument panel and oil and temperature gauges. Requires legs, power take-off, radiator and fan and inclosures.....Add	46.50	15	.....
& 690325	NATURAL GAS REGULATOR. Includes screen and fittings.....Add	54.00	15	.....
& 690326	LP GAS VAPORIZER AND FILTER. Includes brackets, fittings and tubing....Add	94.00	25	.....
690140	FUEL PUMP. For gasoline.....Add	24.50	5	.....
& 690001	FUEL TANK. 10 gallon. For gasoline.....Add	45.00	40	.....
& 690224	POWER TAKE-OFF. Includes housing with rear legs, clutch and shaft. No SAE housing required.....Add	142.00	150	.....
& 690225	RADIATOR AND FAN. Includes pressure cap.....Add	153.00	155	.....
& 690138	FAN GUARD.....Add	16.50	5	.....
& 690044	INCLOSURES. Includes hood, support and side covers.....Add	63.00	80	.....
& 690282	INCLOSURES. For units with side mounted magneto.....Add	63.00	80	.....
690019	ELECTRIC STARTING RECEPTACLE.....Add	14.50	3	.....
& 690324	GENERATOR, 12-Volt. Includes ammeter. Less battery cables.....Add	43.00	23	.....
& 690281	STARTING MOTOR, 12-Volt.....Add	52.00	25	.....

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	HD220-4A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Additional Equipment - Factory Installed Only (Continued)			
& 690229	MAGNETO IGNITION. Bendix-Scintilla with side mounted drive. In place of standard magneto.....Add	98.00	40	.....
690340	HIGH ALTITUDE CYLINDER HEADS. Gasoline. In place of standard.....Add	10.00	-	.....
& 690179	SIDE MOUNTED OIL FILTER. In place of standard.....Add	7.25	3	.....
	Additional Equipment - Not Factory Installed			
690005	SAE NO. 4 FLYWHEEL HOUSING.....	43.75	40	.....
& 690006	REAR LEGS. For No. 4 SAE housing.....	8.50	11	.....
& 690003	SIGHT OIL GAUGE.....	8.00	1	.....
690155	TACHOMETER. For use with distributor ignition only.....	31.25	5	.....
& 690070	POWER TAKE-OFF. Includes housing with rear legs, clutch and shaft.....	156.00	150	.....
& 690084	BATTERY CABLES.....	3.75	2	.....
& 690338	HEAT EXCHANGER EXPANSION TANK.....	61.50	52	.....
	11A17296 Starting crank. Available from Parts.			
	Battery: Recommend (one) 12-volt, 11 plate, 72 ampere hour capacity.			

Specifications Bulletin 1019 (4-67)

MINNEAPOLIS-MOLINE®

336A-4A POWER UNIT



GENERAL DESCRIPTION

The Minneapolis-Moline 336A-4A Power Unit is a 336 cubic inch engine capable of operating at 1600 RPM on continuous duty and 1800 RPM intermittent duty. At 1600 RPM, this unit produces 88 horsepower with LP gas and 85 horsepower with natural gas. The 336A-4A is a uniquely dependable, long life, heavy duty engine built for 24-hour-a-day service. Approximate weight—stripped, but with PTO, legs and instruments . . . 1460 lbs.

Economical design—heavy crankcase with blocks and heads cast in pairs . . . a Minneapolis-Moline exclusive.

Full pressure lubrication throughout—full flow oil system is joined with a large capacity gear lube pump that delivers 12 GPM @ 1800 RPM.

Cool running engine—large capacity water pump flows 35 GPM at 1800 RPM. Cooling system includes one-piece water outlet manifold, with thermostat.

Heavy crankshaft and connecting rod design—with precision trimetal inserts.

FUEL NOTE: For operation on natural gas containing less than 80% methane, order Basic Power Unit with 9.1:1 compression ratio.
For operation on LP gas not conforming to HD5 specifications, order 8.0:1 compression ratio cylinder head option listed under Additional Equipment.

STANDARD EQUIPMENT

Water pump and oil pump
Manifolds and carburetor
Oil filter and governor
Oil bath air cleaner
Magneto, spark plugs and cables
Stack type air cleaner
Distributor, spark plugs and cables
Flywheel and ring gear
Fan drive pulley
Positive crankcase ventilation
Lifting eye. Muffler
Thermostat and bypass

ADDITIONAL EQUIPMENT

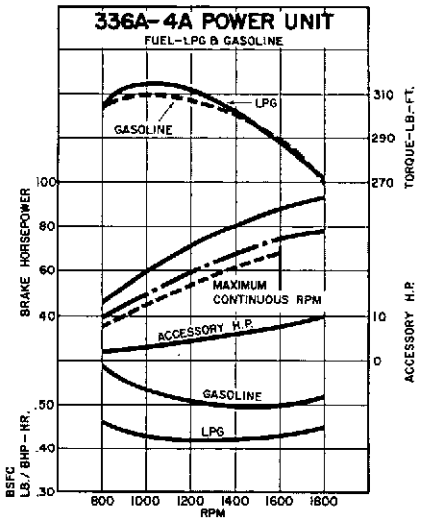
(factory installed only)

Instrument panel and controls.
SAE No. 2 flywheel housing.
Power unit legs, front and rear. Requires 690202 SAE housing.
PTO clutch and clutch shaft. Requires 690202 SAE housing.
Radiator and fan with pressure cap. Std. manifolds.
Enclosures.
Optional. Cylinder heads.
Vacuum Gauge.
Fan guard.
Starting motor. 12 volt.
Generator. 12 volt.
Electric starting receptacle.
Heat exchanger base pan. Includes dual 6½" x 9" filter.
Combination carburetor, natural gas, LP or gasoline.
Automatic oil level control.
Safety switches. Murphy, oil and temperature.
Fuel tank—20 gallon.
Pusher type fan. Requires fan guard 690013. Replaces std. fan.
Hour meter.
Hoist controls.
Remote instrument panel.
Natural gas regulator and filter with fittings.
LP gas vaporizer (Ensign Model RDH requires brkt. bundle to install.
Brackets, fittings and tubing.
Bendix S4RN-401 magneto in place of std.
Water cooled mani. (in place of std.-NG-LPG only).

(Not factory installed)

Battery cables.
SAE No. 3 flywheel housing.
Heat exchanger expansion tank.
LP gas vaporizer (Ensign Model RDH). Requires brkt. bundle to install.
Brackets, fittings and tubing.
Nat. gas regulator & filter with fittings.
Elec. Tachometer-Magneto Ignition.
Sight oil gauge.
Remote Instrument Panel.

PERFORMANCE



FOR STRIPPED ENGINES:

———— Maximum Output—(29.92" Hg. & 60°F.)
— — — — Intermittent Rating
- - - - - - Continuous Rating

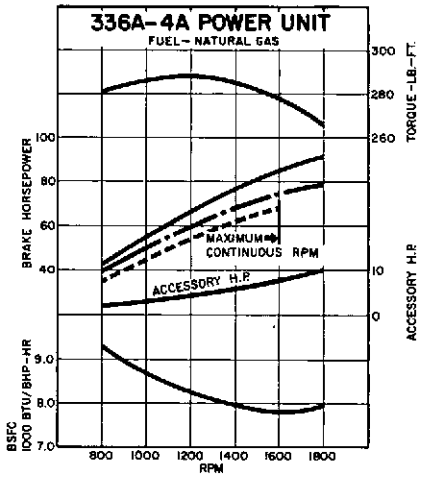
NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

NOTE: Natural Gas performance run with fuel HHV=1000 BTU/FT.^{3}: Fuel Consumption based on LHV=900 BTU/FT.^{3}.

LPG performance run with HD5 or equivalent quality. Gasoline performance run with regular grade fuel.



MINNEAPOLIS·MOLINE MM *Long Life Engines*

336A-4A POWER UNIT

MINNEAPOLIS-MOLINE, INC. Hopkins, Minnesota • A Subsidiary of WHITE MOTOR CORPORATION

GENERAL:
- Bore and stroke ..... 4⅝" x 5"
- Number of cylinders 4
- Piston displacement ..... 336 cu. in.
- RPM at piston speed of 1250 fpm 1500
- Rotation — facing flywheel end ..... C.C.W.
- Compression ratio
  - Natural gas only 10.4:1
  - LP gas or natural gas 9.1:1
  - Regular gasoline 7.0:1
- Compression pressure
  - Natural gas ..... 260 psi
  - LP gas ..... 235 psi
  - Regular gasoline ..... 165 psi

CRANKSHAFT:
- Material ..... Drop-forged steel, heat treated
- *Bearings, number* 3
- Size, front ..... 2 7/32" dia. x 2 1/16"
- Intermediate ..... 2 7/32" dia. x 2 1/16"
- Rear ..... 2 7/32" dia. x 3 1/2"
- Type ..... Precision tri-metal

CYLINDERS:
- Material ..... Special alloy cast iron
- Removable cylinder blocks ..... Cast in pairs

CYLINDER HEADS:
- Cast ..... In pairs
- Material ..... Special alloy cast iron

CONNECTING RODS:
- Material ..... Drop-forged steel, heat treated
- Style ..... Forged I-section
- Bearings, size ..... 2 7/32" dia. x 2 1/16"
- Type ..... Precision tri-metal

PISTONS:
- Material ..... Aluminum alloy, tin-plated
- Rings, number 4
- Compression ..... Three — 3/32" wide
- Oil ..... One — 3/16" wide

PINS:
- Type ..... Full floating
- Bearings, size ..... 1 1/4" dia. x 2"
- Bushing material ..... Bronze, steel-backed

CAMSHAFT:
- Material ..... Cast Proferall metal
- Number of bearings 3
- Drive ..... Helical gears

VALVES AND VALVE MECHANISM:
- Arrangement ..... In head
- Tappets, type ..... Barrel ported
- Material ..... Chilled cast iron
- Intake valves ..... 1 23/32" Alloy steel
- Exhaust valves ..... 1 19/32" Stellite faced
- Valve seats (exhaust valve) ..... Stellite
- Valve rotators ..... Gasoline, exhaust valves only

IGNITION:
- Magneto ..... Heavy-duty, flange-mounted
- Spark Plugs ..... 18 mm

OILING SYSTEM:
- Pump type ..... Submerged gear, located in sump
- Pump capacity ..... 12 gpm @ 1800 rpm
- *Filter — Full flow ..... Replaceable cartridge located in base pan*
- Pressure points ..... Rod, main and camshaft bearings, timing gears, valve mechanism and governor
- Crankcase capacity—
  - Regular base pan ..... 2¼ gallons
  - Heat exchanger base pan ..... 3½ gallons
- *Oil level gauges* ..... Bayonet and sight
- Pressure gauge ..... On instrument panel

CRANKCASE VENTILATION:
- Breather ..... Oil-wash
- Ventilators ..... Vacuum metering valve connected to intake manifold

FUEL SYSTEM:
- Carburetor, gasoline ..... 1¼" Schebler
- Natural gas or LP gas ..... 1¼" Ensign

COOLING SYSTEM:
- Pump, type ..... Centrifugal
- Drive ..... Gear
- Capacity ..... 35 gpm @ 1800 rpm
- *Coolant by-pass ..... Thermostatically controlled*
- Fan, size ..... 22", 4 blade
- Bearing ..... Tapered roller
- Drive ..... V-belt
- Capacity (regular) ..... 12 gallons
- Add for heat exchanger base pan ..... 1 gallon
- Add for water cooled exhaust manifold ..... 1½ gallons
- *Radiator, core ..... Tubular, lead-coated*
- Tanks ..... Cast iron top and bottom tanks
- Grille ..... Heavy punched steel
- Water temperature ..... Thermostatically controlled
- Temperature indicator ..... On instrument panel

POWER TAKEOFF:
- Clutch ..... 11½" *over center*
- Shaft ..... 2¼" dia. with 5/8" x 5/16" keyway
- Flywheel housing ..... SAE No. 2 flange
- Power take-off ..... SAE No. 2 (two inspection covers)
- Outboard bearing ..... 2 tapered roller bearings
- Pilot bearing ..... Double row ball bearing
- Lubrication ..... Pressure gun to pilot, clutch throwout and outboard bearings
- Shifter lever ..... Mounted on either side of unit

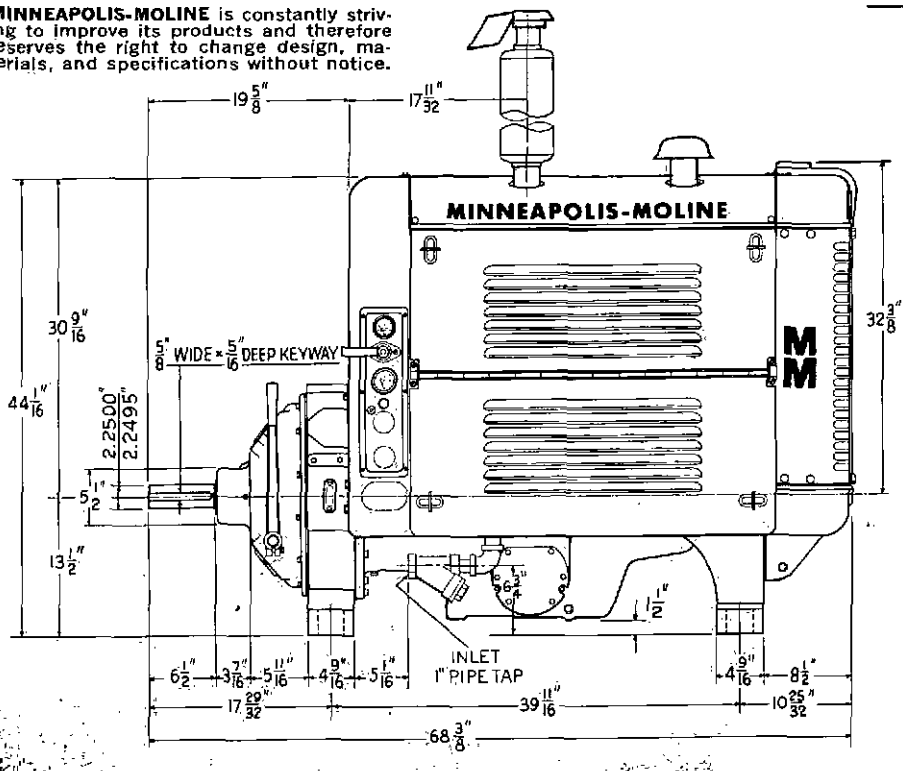
INSTRUMENT PANEL:
- Panel ..... Enclosed and mountable on either side of engine
- Instruments ..... Water temperature gauge, oil pressure gauge, hand throttle. Provisions for starter button, *ammeter, and starting cable receptacle.*

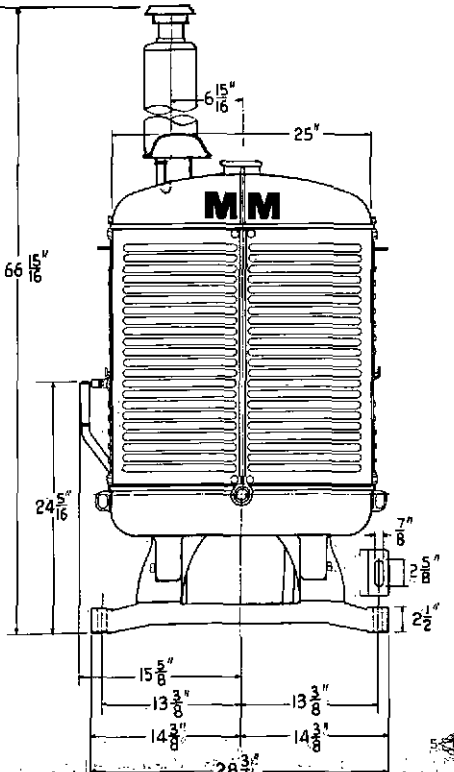
ENCLOSURES:
- Hood ..... Formed of heavy gauge steel hinged at center and securely bolted in place.
- Side covers ..... Heavy gauge steel hinged at center and entirely removable. Top half may be folded down or bottom folded up and latched in position.
- Rear cover ..... Reinforced heavy gauge steel

SAFETY EQUIPMENT:
- Oil pressure ..... Stops engine if oil pressure drops below safe limit
- Water temperature ..... Stops engine if temperature exceeds safe limit

MISCELLANEOUS:
- Governor drive ..... Enclosed in crankcase
- Muffler ..... Aluminized steel, low resistance
- Air cleaner ..... Oil bath
- Starting ring gear ..... Mounted on flywheel
- Electric starting equipment ..... 12-volt heavy duty
- Electric starting receptacle ..... Plug-in Cannon type
- Tachometer drive ..... Driven from cam gear
- *Heated base pan ..... Cast iron, water jacketed*
- Manifolds ..... Standard or water cooled
- Vacuum gauge ..... Mounts on intake manifold

MINNEAPOLIS-MOLINE is constantly striving to improve its products and therefore reserves the right to change design, materials, and specifications without notice.



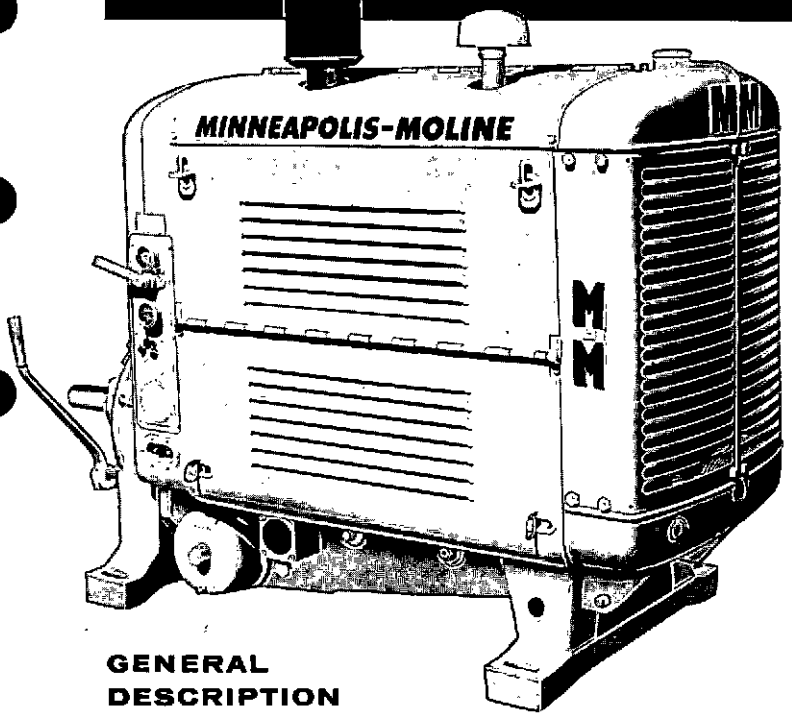


Bulletin 1018 (5-67)

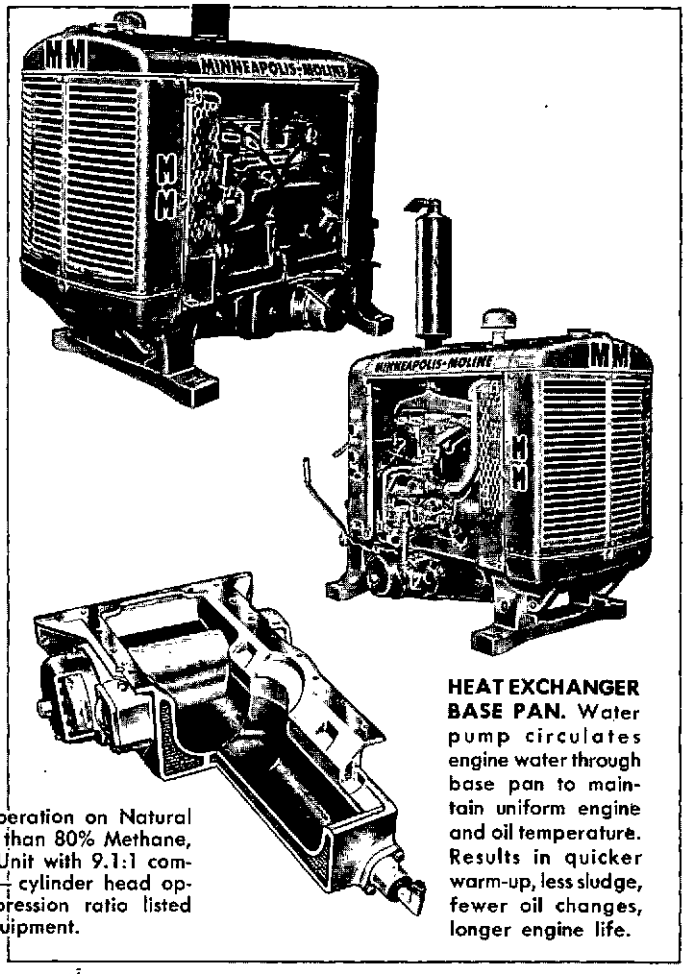
MINNEAPOLIS-MOLINE

Model 336A-4A Natural Gas

POWER UNIT



Oil Field Power

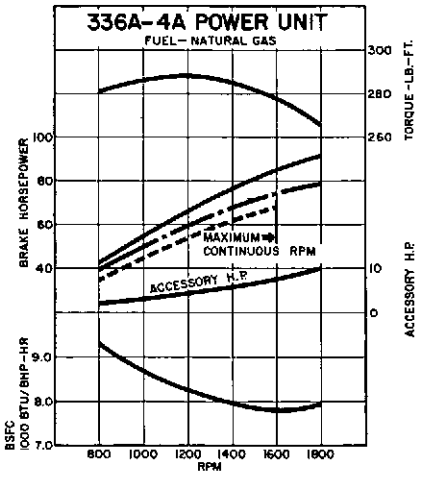


HEAT EXCHANGER BASE PAN. Water pump circulates engine water through base pan to maintain uniform engine and oil temperature. Results in quicker warm-up, less sludge, fewer oil changes, longer engine life.

GENERAL DESCRIPTION

Type	4 cylinder valve-in-head
Bore and stroke	4⅝ x 5 inches
Piston displacement	336 cu. in.
Compression ratio	10.4 to 1
Compression pressure	260 psi
Maximum hp at 1600 rpm (natural gas)	84
Approximate weight	1926 lbs.

FUEL NOTE: For operation on Natural Gas containing less than 80% Methane, order basic Power Unit with 9.1:1 compression ratio — or — cylinder head option of 8.0:1 compression ratio listed under additional equipment.



FOR STRIPPED ENGINES:

——————— Maximum Output— (29.92" Hg. & 60°F.)

— — — — — Intermittent Rating

- - - - - - - - Continuous Rating

NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

NOTE: Natural Gas performance run with fuel HHV=1000 BTU/FT.^{3}: Fuel Consumption based on LHV=900 BTU/FT.^{3}.

STANDARD EQUIPMENT

Sheet metal enclosures
Hinged hood
Folding side doors
Legs, front and rear
Radiator and Fan assembly
Radiator pressure cap
Instrument panel and controls
S.A.E. No. 2 flywheel housing
Muffler
Power take-off, housing, clutch
Twin disc clutch
Manifolds and carburetor
Heavy-duty magneto
Built-in governor
Oil pump and water pump
Oil pressure gauge
Water temperature gauge
Natural gas regulator and filter
Vacuum gauge
Sight oil gauge
Water thermostat, by-pass
Water temperature cutout
Oil pressure cutout
Oil filter, 2 replaceable cartridges
Oil bath air cleaner
Vacuum crankcase ventilation
Flywheel, fan drive pulley
Flywheel ring gear
Exhaust valve seat inserts, Stellite
Starter motor, 12-volt
Plug-in starting receptacle
Fan guard
Spark plugs and cables
Heat exchanger base pan
Aluminum pistons
Standard tools

ADDITIONAL EQUIPMENT

Optional cylinder heads
Generator, 12-volt
Stack-type air cleaner — in place of standard
Combination natural gas-gasoline carburetor
Automatic oil level control
Pusher-type fan
Distributor ignition, 12 volts
Remote control instrument panel (for distributor ignition only)
Hour meter
Electric tachometer
Water-cooled manifolds
Battery cables
Heat exchanger expansion tank

Sold and Serviced by:

SPECIFICATIONS FOR MODEL 336A-4A OIL FIELD POWER UNIT

GENERAL:
- Bore and stroke ..... 4⅝ x 5"
- Number of cylinders 4
- Piston displacement ..... 336 cu. in.
- RPM at piston speed of 1250 fpm ..... 1500 RPM
- Rotation — flywheel end ..... C.C.W.
- Maximum hp at 1800 rpm natural gas 91
- Compression ratio ..... 10.4 to 1
- Compression pressure ..... 260 psi

CRANKSHAFT:
- Material ..... Drop forged steel
- Number of bearings 3
- Size of bearings—
  - Front ..... 2⁷⁹/₃₂" D. x 2⅜"
  - *Intermediate* ..... 2⁷⁹/₃₂" D. x 2¼"
  - Rear ..... 2⁷⁹/₃₂" D. x 3½"
- Bearing type ..... Precision tri-metal

CYLINDERS:
- Cast ..... In pairs
- Material ..... Spec. alloy cast iron
- Cylinder blocks ..... Removable

CYLINDER HEADS:
- Cast ..... In pairs
- Material ..... Spec. alloy cast iron

CONNECTING RODS:
- Material ..... Drop forged steel
- Style ..... Forged I section
- Bearing size ..... 2⁷⁹/₃₂" D. x 2¼"
- Bearing type ..... Precision tri-metal

PISTONS:
- Material ..... Aluminum alloy
- Rings—
  - Number 4
  - Compression ..... 3 Rings — ⅜₂" wide
  - Oil ..... 1 Ring — ⅜₁₆" wide

PISTON PINS:
- Type ..... Full floating
- Bearing size ..... 1¼" D. x 2"
- Bushing material ..... Bronze, steel backed

CAMSHAFT:
- Material ..... Cast Proferall metal
- Number of bearings 3
- Drive ..... Helical gear

IGNITION:
- Magneto ..... Heavy duty, flange mounted
- Spark plugs ..... 18 mm

VALVES AND VALVE MECHANISM:
- Arrangement ..... In head
- Intake valves ..... 1²³⁄₃₂" alloy steel
- Exhaust valves ..... 1¹⁹⁄₃₂" Stellite faced
- Valve seat inserts ..... Stellite on exhaust valves only
- Tappet type ..... Barrel-type, ported
- Tappet material ..... Chilled cast iron

FUEL SYSTEM:
- Carburetor—
  - *Natural gas* ..... 1¼" *Ensign*

CRANKCASE VENTILATION:
- Breather ..... Oil wash
- Ventilators ..... Metering valve connected to intake manifold

OILING SYSTEM:
- Pump type ..... Submerged gear, located in sump
- Pump capacity ..... 12 gpm @ 1800 rpm
- Filter ..... 2 replaceable cartridges located in base pan
- Pressure points ..... Rod, main and camshaft bearings, timing gears, valve mechanism and governor
- Crankcase capacity—
  - Regular base pan ..... 2¼ gallons
  - Heat exchanger base pan ..... 3½ gallons
- Oil level gauges ..... Bayonet and sight
- Pressure gauge ..... On instrument panel

COOLING SYSTEM:
- Pump ..... Centrifugal gear driven, 35 gpm at 1800 rpm
- Water by-pass ..... Thermostat controlled
- Fan ..... 22", *4-blade on tapered roller bearings*
- Fan guard ..... Steel mesh
- Capacity with standard equipment ..... 12 gallons
  - Add for heat exchanger base pan ..... 1 gallon
- Radiator core ..... Tubular, lead-coated
- Tanks ..... Cast iron top and bottom tanks
- Radiator grille ..... Heavy punched steel
- Water temperature ..... Thermostatically controlled
- Water temperature gauge ..... On instrument panel

POWER TAKE-OFF:
- Clutch ..... 11½" over center
- Shaft ..... 2¼" D. with ⅝" x ⅜₁₆" keyway
- Clutch housing ..... S.A.E. No. 2, 2 inspection covers
- Flywheel housing ..... S.A.E. No. 2 flange
- Outboard bearing ..... Two tapered roller bearings
- Pilot bearing ..... Double row ball
- Lubrication ..... Pressure gun to pilot, clutch throwout and outboard bearings
- Shifter lever ..... Mounted on either side of unit

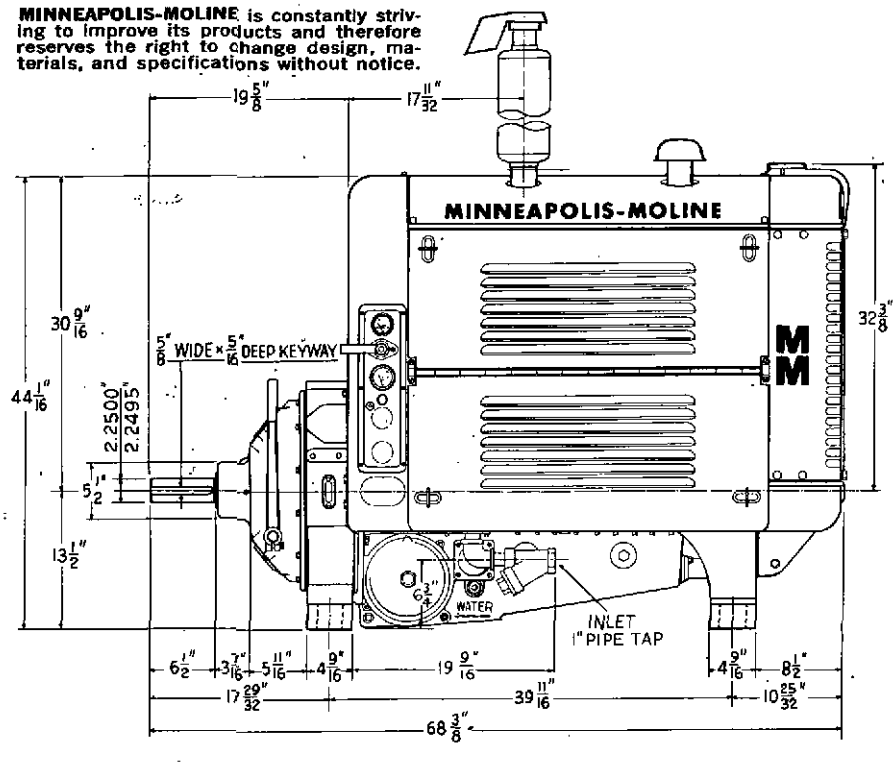
INSTRUMENT PANEL:
- *Panel* ..... *Enclosed, mounted on either side of unit*
- Instruments and controls ..... Safety water temperature gauge, oil pressure gauge with safety cut-outs, ignition switch, starting switch, hand throttle.

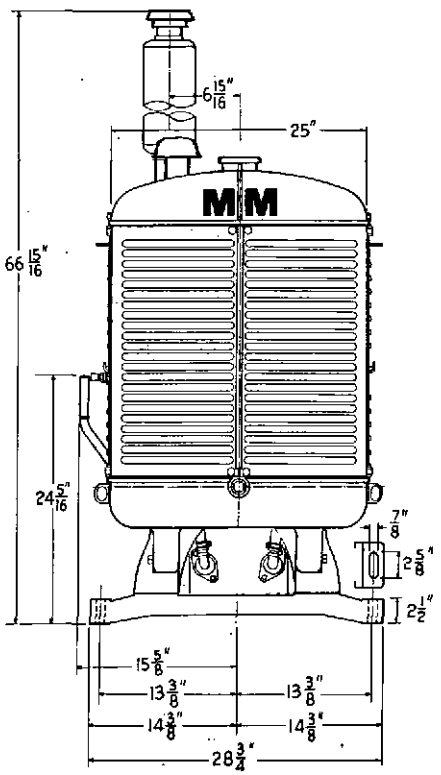
ENCLOSURES:
- Hood ..... Formed of heavy gauge steel hinged at center, and securely bolted in place
- Side covers ..... Heavy gauge steel hinged at center and entirely removable. Top half may be folded down or bottom folded up and latched in position. No bolts or screws required.
- Rear cover ..... Reinforced heavy gauge steel

SAFETY EQUIPMENT:
- Oil pressure ..... Stops engine if oil pressure drops below safe limit
- Water temperature ..... Stops engine if temperature exceeds safe limit

MISCELLANEOUS:
- Governor drive ..... Enclosed in crankcase
- Muffler ..... Aluminized steel, low resistance
- Air cleaner ..... Oil bath
- Starting ring gear ..... Mounted on flywheel
- *Electric starting equipment* ..... *12-volt heavy duty*
- Electric starting receptacle ..... Plug-in Cannon type
- Tachometer drive ..... Driven from cam gear
- Heated base pan ..... Cast iron, water jacketed
- Manifolds ..... Standard or water cooled
- Vacuum gauge ..... Mounts on intake manifold

MINNEAPOLIS-MOLINE is constantly striving to improve its products and therefore reserves the right to change design, materials, and specifications without notice.





MINNEAPOLIS·MOLINE MM *Long Life Engines*

MINNEAPOLIS-MOLINE, INC. Hopkins, Minnesota • A Subsidiary of WHITE MOTOR CORPORATION

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	336A-4A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Standard Equipment			
	4-5/8 x 5 4-cylinder Moline engine. Manifolds. Carburetor. Water pump. Oil pump. Oil filter. Oil bath air cleaner. Governor. Magneto or distributor. Spark plugs and cables. Flywheel and ring gear. Fan drive pulley. Muffler. By-pass thermostat. Valve cover. Vacuum ventilation. Lifting eye.			
	Basic Power Units - With stack air cleaner. Nos. 30100971 and after. Comp. Ratio			
+ 631113	336A-4A BASIC POWER UNIT. Magneto - gasoline.....7.0:1	1266.00	1190	.....
+ 631123	336A-4A BASIC POWER UNIT. Distributor - gasoline.....7.0:1	1222.00	1190	.....
+ 631413	336A-4A BASIC POWER UNIT. Magneto - LP gas or natural gas.....9.1:1	1276.00	1190	.....
+ 631423	336A-4A BASIC POWER UNIT. Distributor - LP gas or natural gas.....9.1:1	1232.00	1190	.....
+ 631612	336A-4A BASIC POWER UNIT. Magneto - natural gas only.....10.4:1	1276.00	1190	.....
+ 631622	336A-4A BASIC POWER UNIT. Distributor - natural gas only.....10.4:1	1232.00	1190	.....
	Basic Power Units - Nos. 30100970 and prior.			
# 631112	336A-4A BASIC POWER UNIT. Magneto - gasoline.....7.0:1	1250.00	1180	.....
# 631122	336A-4A BASIC POWER UNIT. Distributor - gasoline.....7.0:1	1206.00	1180	.....
# 631412	336A-4A BASIC POWER UNIT. Magneto - LP gas or natural gas.....9.1:1	1260.00	1180	.....
# 631422	336A-4A BASIC POWER UNIT. Distributor - LP gas or natural gas.....9.1:1	1216.00	1180	.....
# 631611	336A-4A BASIC POWER UNIT. Magneto - natural gas only.....10.4:1	1260.00	1180	.....
# 631621	336A-4A BASIC POWER UNIT. Distributor - natural gas only.....10.4:1	1216.00	1180	.....
	Fuel note: For operation on natural gas containing less than 80% methane, order Basic Power Unit with 9.1:1 compression ratio. For operation on LP gas not conforming to HD5 specifications, order 8.0:1 compression ratio cylinder head option listed under Additional Equipment.			
	Note: Basic unit does not include instrument panel, SAE No. 2 flywheel housing, power take-off, power unit legs, radiator and fan or inclosures. See Additional Equipment.			
	Note: Natural gas or LP gas units require a regulator or vaporizer to complete. See Additional Equipment.			
	Additional Equipment - Factory Installed Only			
690202	SAE NO. 2 FLYWHEEL HOUSING.....Add	39.00	80	.....
690203	POWER UNIT LEGS. Front and rear. Requires 690202 flywheel housing.....Add	48.00	125	.....
690319	INSTRUMENT PANEL AND CONTROLS. Less gauges. Requires 690320, 690321 or 690322.....Add	25.00	4	.....
690320	STANDARD GAUGES: Oil and temperature.....Add	9.25	1	.....
690321	SAFETY CUT-OUTS. (Murphy). Includes oil and temperature gauges. For magneto ignition.....Add	23.00	2	.....
690322	SAFETY CUT-OUTS. (Murphy). Includes oil and temperature gauges. For distributor ignition.....Add	35.25	2	.....
690111	HOURMETER.....Add	33.25	2	.....
690141	VACUUM GAUGE. With shut-off valve. (Mounts on intake manifold).....Add	11.00	3	.....
690086	HOIST CONTROLS. For gasoline units with magneto ignition. Includes instrument panel and oil and temperature gauges. Requires flywheel housing, legs, power take-off, radiator and fan and inclosures.....Add	67.00	25	.....

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	336A-4A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Additional Equipment - Factory Installed Only (Continued)			
690298	NATURAL GAS REGULATOR. Includes screen. Includes mounting parts for use with standard manifolds and standard base pan. Requires 690299, 690300 or 690301 for use with water-cooled manifolds or heat exchanger base pan.....Add	54.00	15	.....
690299	BY-PASS TUBING. For use with standard manifolds and heat exchanger base pan.....Add	4.75		.....
690300	BY-PASS TUBING. For use with water-cooled manifolds and standard base pan.....Add	No chge.	-	.....
690301	BY-PASS TUBING. For use with water-cooled manifolds and heat exchanger base pan.....Add	6.25	-	.....
690293	LP GAS MODEL "RDH" VAPORIZER AND FILTER. Requires 690294, 690295, 690296 or 690297 to complete.....Add	70.00	25	.....
690296	BRACKETS, FITTINGS AND TUBING. For use with standard manifolds and standard base pan.....Add	33.25	10	.....
690297	BRACKETS, FITTINGS AND TUBING. For use with standard manifolds and heat exchanger base pan.....Add	35.50	10	.....
690294	BRACKETS, FITTINGS AND TUBING. For use with water-cooled manifolds and standard base pan.....Add	35.50	10	.....
690295	BRACKETS, FITTINGS AND TUBING. For use with water-cooled manifolds and heat exchanger base pan.....Add	37.00	10	.....
690077	COMBINATION CARBURETOR. Natural gas-gasoline or LP gas-gasoline. In place of gasoline carburetor.....Add	27.50	9	.....
690228	ELECTRIC FUEL PUMP. For gasoline.....Add	24.00	5	.....
690010	FUEL TANK. 20 Gallon. For gasoline.....Add	70.00	60	.....
690204	POWER TAKE-OFF. Requires 690202 flywheel housing. Includes housing, clutch and shaft.....Add	175.00	150	.....
690171	RADIATOR AND FAN. For gasoline, natural gas or LP gas with standard manifolds. Includes pressure cap.....Add	188.00	229	.....
690209	RADIATOR AND FAN. For natural gas or LP gas with water-cooled manifolds. Includes pressure cap.....Add	292.00	250	.....
690072	PUSHER TYPE FAN. In place of standard fan. Requires fan guard.....Add	6.00	-	.....
# 690013	FAN GUARD. For use with standard air cleaner. For Nos. 30100970 and prior.....Add	26.00	7	.....
& 690221	FAN GUARD. For use with stack air cleaner on Nos. 30100970 and prior; for all units Nos. 30100971 and after.....Add	26.00	7	.....
690046	INCLOSURES. Includes hood, support and side covers.....Add	74.50	119	.....
690004	ELECTRIC STARTING RECEPTACLE.....Add	14.50	1	.....
690292	GENERATOR. 12-Volt. Includes ammeter. Less battery cables.....Add	52.50	24	.....
690343	STARTING MOTOR. 12-Volt.....Add	52.00	25	.....
690345	HOIST STARTING EQUIPMENT. 12-Volt. For use with hoist controls. Includes generator and battery cables.....Add	111.00	53	.....
690311	MAGNETO. Bendix-Scintilla S4RN-401. In place of standard magneto.....Add	No Chge.	-	.....
# 690205	STACK AIR CLEANER. In place of standard. For use with standard manifolds only on Nos. 30100970 and prior. Use 690221 fan guard.....Add	16.00	10	.....
690279	HEAT EXCHANGER BASE PAN. In place of standard. With by-pass oil filters.....Add	167.00	10	.....
690099	AUTOMATIC OIL LEVEL CONTROL. For use with heat exchanger base pan.....Add	21.00	1	.....
190405	HIGH ALTITUDE CYLINDER HEADS. Gasoline. In place of standard.....Add	10.00	-	.....
190407	CYLINDER HEAD. 8.0:1 compression ratio. In place of standard for LP gas not conforming to HD5 specifications.....Add	10.00	-	.....
690208	WATER COOLED MANIFOLDS. For natural gas or LP gas. In place of standard.....Add	113.00	35	.....

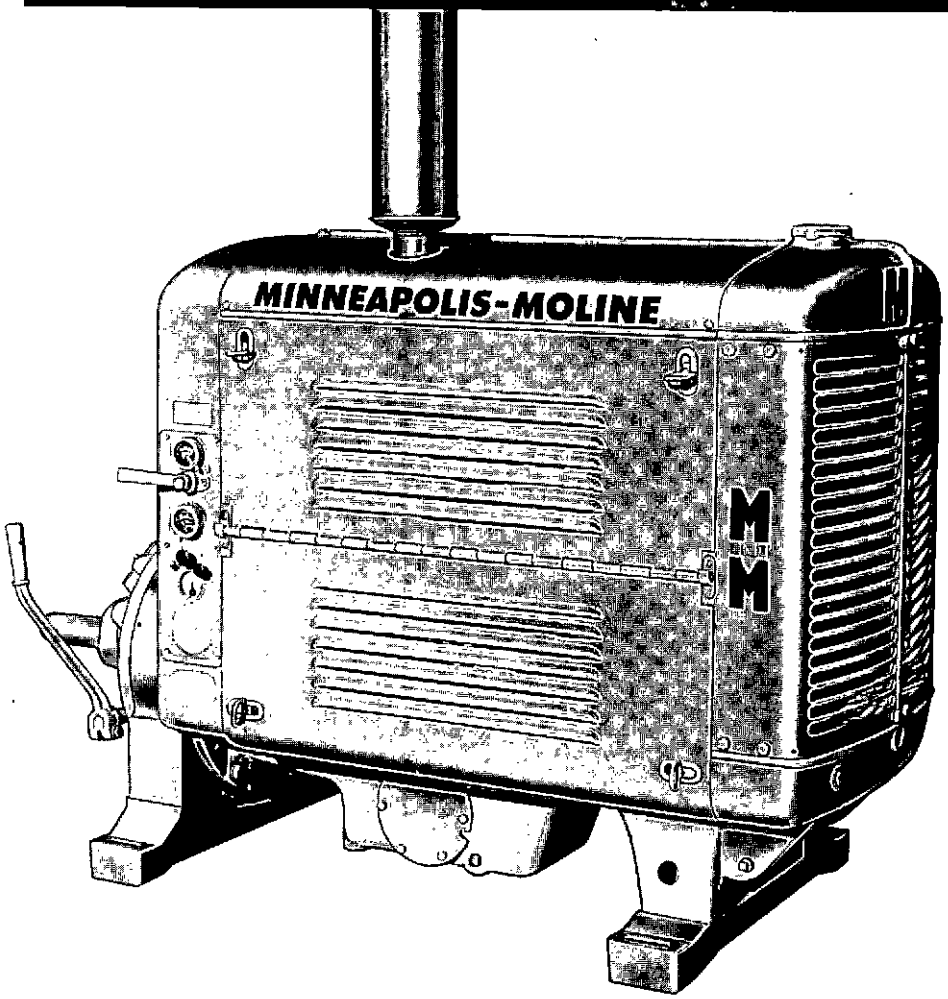
Printed in U.S.A.

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	336A-4A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Additional Equipment - Not Factory Installed			
& 690016	SAE NO. 2 FLYWHEEL HOUSING	45.00	80	.....
& 690169	SAE NO. 3 FLYWHEEL HOUSING	45.00	80	.....
& 690252	POWER UNIT LEGS. Front and rear. Requires flywheel housing	48.00	125	.....
690186	REMOTE CONTROL INSTRUMENT PANEL. For distributor ignition	63.50	15	.....
690134	ELECTRIC TACHOMETER. For magneto ignition	71.00	5	.....
& 690212	SIGHT OIL GAUGE	8.00	2	.....
& 690307	NATURAL GAS REGULATOR. Includes screen. Includes mounting parts for use with standard manifolds and standard base pan. For use with water-cooled manifolds and heat exchanger base pan, also requires 690308, 690309 or 690310	48.50	15	.....
690308	BY-PASS TUBING. For use with standard manifolds and heat exchanger base pan	5.50		.....
690309	BY-PASS TUBING. For use with water-cooled manifolds and standard base pan	2.35		.....
& 690310	BY-PASS TUBING. For use with water-cooled manifolds and heat exchanger base pan	7.00		.....
690302	LP GAS MODEL "RDH" VAPORIZER AND FILTER. Requires 690305, 690306, 690303 or 690304 to complete	70.00	25	.....
690305	BRACKETS, FITTINGS AND TUBING. For use with standard manifolds and standard base pan	25.25	10	.....
690306	BRACKETS, FITTINGS AND TUBING. For use with standard manifolds and heat exchanger base pan	27.00	10	.....
& 690303	BRACKETS, FITTINGS AND TUBING. For use with water-cooled manifolds and standard base pan	27.50	10	.....
& 690304	BRACKETS, FITTINGS AND TUBING. For use with water-cooled manifolds and heat exchanger base pan	29.00	10	.....
& 690007	POWER TAKE-OFF. Includes housing, clutch and shaft. Requires No. 2 flywheel housing	192.00	150	.....
690275	BATTERY CABLES	5.75	2	.....
& 690315	HEAT EXCHANGER EXPANSION TANK	61.50	80	.....
	11A17296 Starting crank. Available from parts.			
	Battery: Recommend (one) 12-Volt, 11 plate, 72 ampere hour capacity.			

MINNEAPOLIS-MOLINE

Specifications Bulletin 1020 (3-67)

D336A-4A
INDUSTRIAL POWER UNIT
(Diesel)



GENERAL DESCRIPTION

The Minneapolis-Moline D336A-4A Power Unit is a 336 cubic inch engine capable of operating at 1600 RPM on continuous and intermittent duty. At 1600 RPM this unit produces 82 horsepower.

This is a remarkably efficient, sturdy engine built to take long periods of punishing service. Approximate weight — stripped, but with PTO, legs and instruments—1480 lbs.

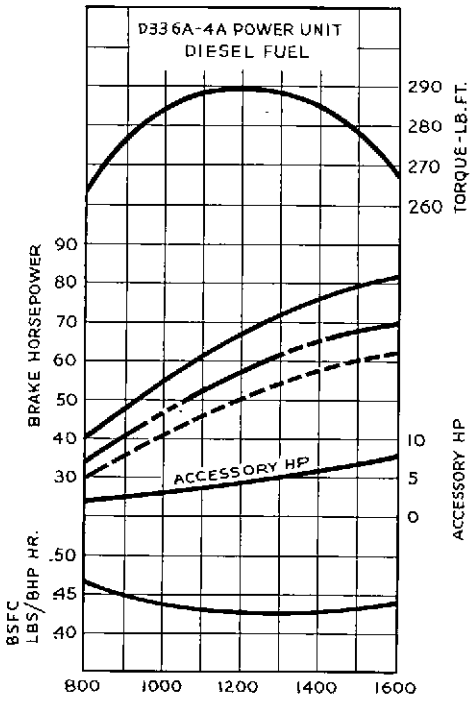
ECONOMICAL DESIGN — heavy crankcase with blocks and heads cast in pairs . . . a Minneapolis-Moline exclusive.

FULL PRESSURE LUBRICATION THROUGHOUT — full flow oil system is joined with a large capacity gear lube pump that delivers 10.5 GPM @ 1600 RPM.

COOL RUNNING ENGINE — controlled cooling system — large capacity water pump flows 30 gallons per minute at 1600 rpm. Includes one piece water outlet manifold with thermostat.

HEAVY CRANKSHAFT AND CONNECTING ROD DESIGN — with precision trimetal inserts.

PERFORMANCE



FOR STRIPPED ENGINES:

———— Maximum Output— (29.92" Hg. & 60°F.)

—— — —— Intermittent Rating

– – – – – – – Continuous Rating

NOTE: To determine allowable continuous or intermittent duty horsepower, at any altitude or temperature conditions, use the values as determined above or 95% of available BHP, whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine ratings of completely equipped units, deduct accessory H.P. from stripped engine curves.

NOTE: Diesel performance run with #2 diesel fuel.

STANDARD EQUIPMENT

Water pump and oil pump
Fuel filter
Manifolds
Oil filter and governor
Oil bath air cleaner
Fuel injection pump
Nozzles and high pressure lines
Flywheel and ring gear
Fan drive pulley
Positive crankcase ventilation
Lifting eye. Muffler
Thermostat and bypass

ADDITIONAL EQUIPMENT

(factory installed only)

Instrument panel and controls.
SAE No. 2 flywheel housing.
Power unit legs, front and rear. Requires 690202 SAE housing.
PTO clutch and clutch shaft. Requires 690202 SAE housing.
Radiator and fan with pressure cap.
Enclosures.
Fan guard.
Starting motor. 12 volt.
Generator. 12 volt.
Electric starting receptacle.
Hour meter
Safety switches. Combination, oil and temperature.
Fuel tank — 20 gallon.
Pusher type fan. Requires fan guard 690013. Replaces std. fan.

(not factory installed)

Battery cables.
SAE No. 3 flywheel housing.
Heat exchanger expansion tank.
Sight oil gauge.

SPECIFICATIONS FOR D336A-4A INDUSTRIAL POWER UNIT

GENERAL:
- Bore and stroke ..... 4⅝" x 5"
- Number of cylinders 4
- Piston displacement ..... 336 cu. in.
- RPM at piston speed of 1250 fpm 1500
- Rotation — facing flywheel end ..... C.C.W.
- *Maximum Corrected HP @ 1600 RPM* 82
- Compression ratio 14.3:1
- Compression pressure — PSI 440

CRANKSHAFT:
- Material ..... Drop-forged steel, heat treated
- Bearings, number 3
  - Size, front ..... 2⅜₃₂" dia. x 2¾₁₆"
  - Intermediate ..... 2⅜₃₂" dia. x 2⅞₁₆"
  - Rear ..... 2⅜₃₂" dia. x 3½"
  - Type ..... **Precision tri-metal**

CYLINDERS:
- Material ..... Special alloy cast iron
- Removable cylinder blocks ..... Cast in pairs
- Controlled combustion ..... Energy cells

CYLINDER HEADS:
- Cast ..... In pairs
- Material ..... Special alloy cast iron

CONNECTING RODS:
- Material ..... Drop-forged steel, heat treated
- Style ..... Forged I-section
- Bearings, size ..... 2⅜₃₂" dia. x 2¼₁₆"
  - Type ..... **Precision tri-metal**

PISTONS:
- *Material* ..... *Aluminum alloy, tin-plated*
- Rings, number 4
  - Compression ..... Three — ⅛" wide
  - Oil ..... One — ⅜₁₆" wide

PINS:
- Type ..... Full floating
- Bearings, size ..... 1½" dia. x 1¾"
- Bushing material ..... Bronze, steel-backed

CAMSHAFT:
- Material ..... Cast Proferall metal
- Number of bearings 3
- Drive ..... Helical gears

VALVES AND VALVE MECHANISM:
- Arrangement ..... In head
- Tappets, type ..... Barrel ported
  - Material ..... Chilled cast iron
- Intake valves ..... 1¹³₃₂" Alloy steel
- Exhaust valves ..... 1½" Alloy steel
- *Valve seats (exhaust valve)* ..... *Stellite*

OILING SYSTEM:
- Pump type ..... Submerged gear, located in sump
- Pump capacity ..... 10.5 gpm @ 1600 rpm
- Filter — Full flow ... Replaceable cartridge located in base pan
- Pressure points .... Rod, main and camshaft bearings, timing gears, valve mechanism and injection pump
- Crankshaft capacity —
  - Regular base pan ..... 2¼ gallons
- Oil level gauges ..... Bayonet and sight
- Pressure gauges ..... On instrument panel

CRANKCASE VENTILATION:
- Breather ..... Oil-wash
- Ventilators ..... Vacuum metering valve connected to intake manifold

FUEL SYSTEM:
- Injection pump ..... Roosamaster
- Injection nozzles ..... Pintle type
- Fuel filter ..... 2 parallel

COOLING SYSTEM:
- Pump type ..... Centrifugal
  - Drive ..... Gear
  - *Capacity* ..... *30 gpm @ 1600 rpm*
- Coolant by-pass ..... Thermostatically controlled
- Fan size ..... 22", 4 blade
  - Bearing ..... Tapered roller
  - Drive ..... V-belt
- Capacity (regular) ..... 12 gallons
- Radiator, core ..... Tubular, lead-coated
  - Tanks ..... Cast iron top and bottom tanks
  - Grille ..... Heavy punched steel
- Water temperature ..... Thermostatically controlled
- Temperature indicator ..... On instrument panel

POWER TAKEOFF:
- *Clutch* ..... *11½" over center*
- Shaft ..... 2¼" dia. with ⅝" x ⅜₁₆" keyway
- Flywheel housing ..... SAE No. 2 flange
- Power take-off ..... SAE No. 2 (two inspection covers)
- Outboard bearing ..... 2 tapered roller bearings
- Pilot bearing ..... Double row ball bearing
- Lubrication ..... Pressure gun to pilot, clutch throwout and outboard bearings
- Shifter lever ..... Mounted on either side of unit

INSTRUMENT PANEL:
- Panel ..... Enclosed and mountable on either side of engine
- Instruments .... Water temperature gauge, oil pressure gauge, *hand throttle. Provisions for starter button,* ammeter, and starting cable receptacle.

ENCLOSURES:
- Hood ..... Formed of heavy gauge steel hinged at center and securely bolted in place.
- Side covers ... Heavy gauge steel hinged at center and entirely removable. *Top half may be folded down or* bottom folded up and latched in position.
- Rear cover .... Reinforced heavy gauge steel

SAFETY EQUIPMENT:
- Oil pressure ..... Stops engine if oil pressure drops below safe limit
- Water temperature .. ... Stops engine if temperature exceeds safe limit

MISCELLANEOUS:
- Governor ..... Built in
- Muffler ..... Aluminized steel, low resistance
- Air cleaner ..... Oil bath
- Starting ring gear ..... Mounted on flywheel
- Electric starting equipment ..... 12-volt heavy duty
- Electric starting receptacle ..... Plug-in Cannon type
- Tachometer drive ..... Driven from cam gear

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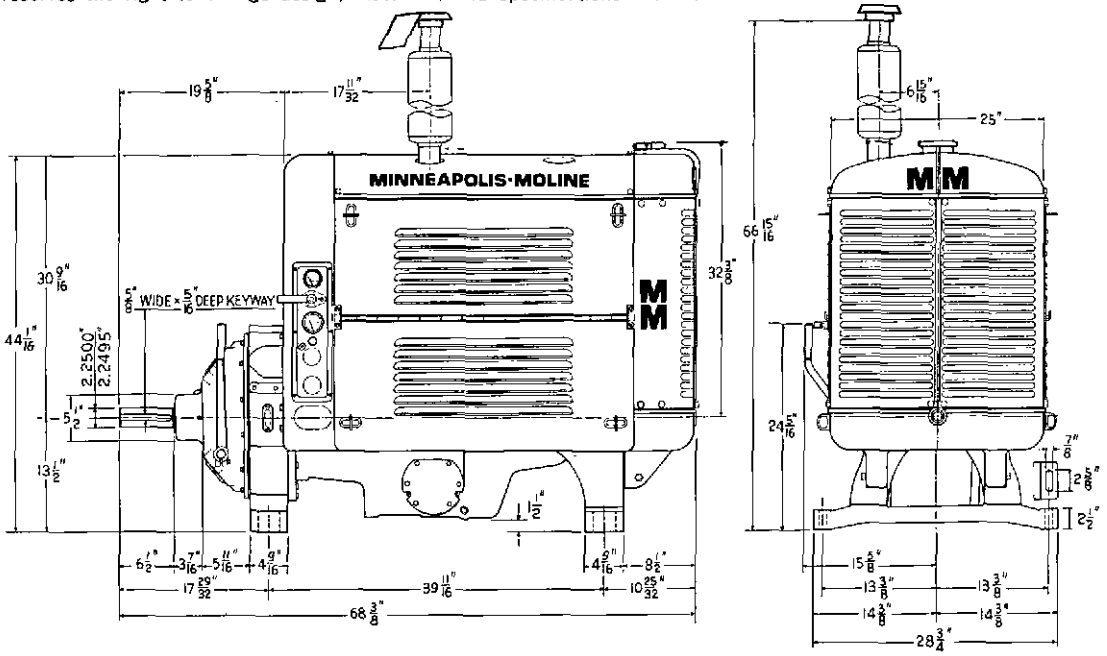


MINNEAPOLIS-MOLINE®

MM® *Long Life Engines*

MINNEAPOLIS-MOLINE, INC., Hopkins, Minnesota
A Subsidiary of WHITE MOTOR CORPORATION

SOLD AND SERVICED BY:

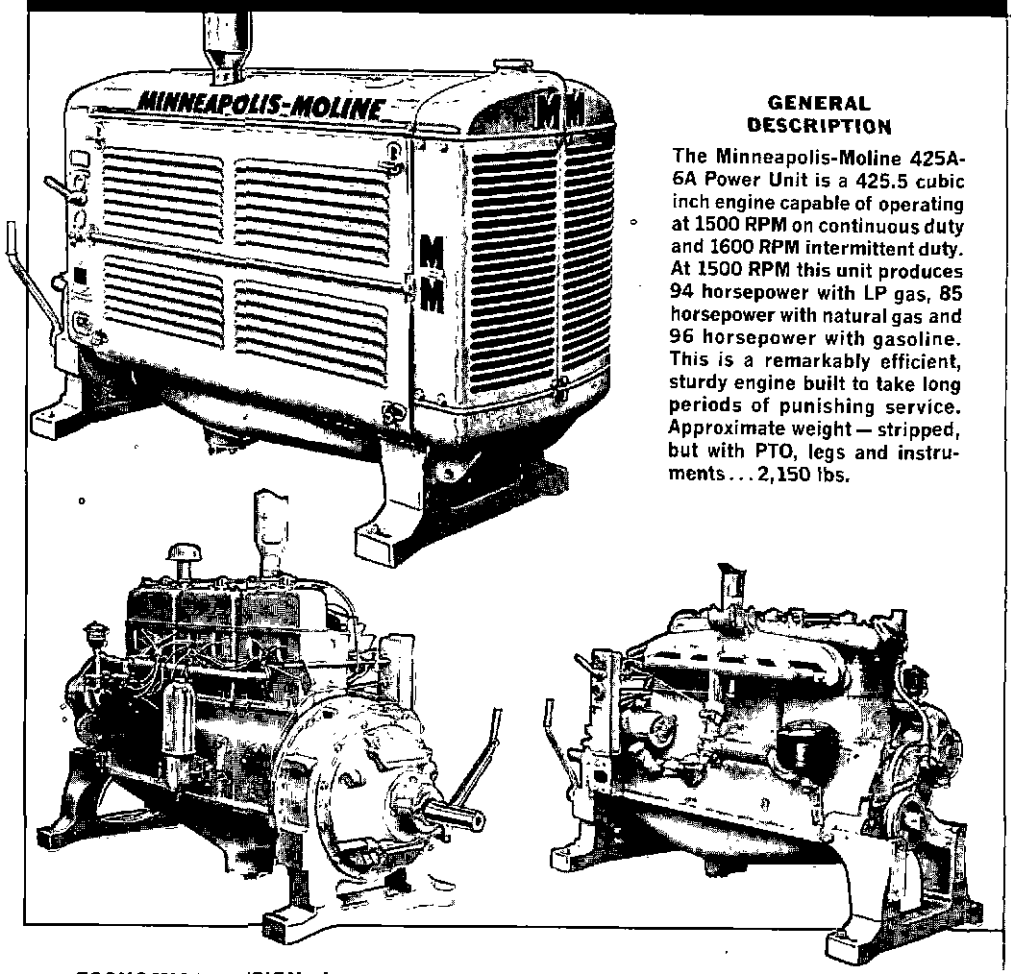
5-54 Printed in U.S.A.

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	D336A-4A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Standard Equipment			
	4-5/8 x 5 4-cylinder Moline engine. Manifolds. Fuel filter. Fuel injection pump. Nozzles and high pressure lines. Water pump. Oil pump. Oil filter. Oil bath air cleaner. Governor. Flywheel and ring gear. Fan drive pulley. Muffler. By-pass thermostat. Valve cover. Vacuum ventilation. Lifting eye.			
631712	D336A-4A BASIC POWER UNIT. Diesel.....	1973.00	1200	.....
	NOTE: Basic unit does not include instrument panel, SAE No. 2 flywheel housing, power take-off, power unit legs, radiator and fan or inclosures. See Additional Equipment.			
	Additional Equipment - Factory Installed Only			
& 690202	SAE NO. 2 FLYWHEEL HOUSING.....Add	39.00	80	.....
& 690203	POWER UNIT LEGS. Front and rear. Requires 690202 flywheel housing....Add	48.00	125	.....
& 690339	INSTRUMENT PANEL AND CONTROLS. Less gauges. Requires 690320 or 690340.....Add	25.00	4	.....
690320	STANDARD GAUGES: Oil and temperature.....Add	9.25	1	.....
690340	SAFETY CUT-OUTS. Includes oil and temperature gauges.....Add	70.00	13	.....
690111	HOURMETER.....Add	33.25	2	.....
& 690178	FUEL TANK. 20 Gallon.....Add	75.00	60	.....
& 690204	POWER TAKE-OFF. Includes housing, clutch and shaft. Requires 690202 flywheel housing.....Add	175.00	150	.....
& 690177	RADIATOR AND FAN. Includes pressure cap.....Add	254.00	250	.....
& 690072	PUSHER TYPE FAN. In place of standard fan. Requires fan guard.....Add	6.00	-	.....
& 690221	FAN GUARD.....Add	26.00	7	.....
& 690046	INCLOSURES. Includes hood, support and side covers.....Add	74.50	119	.....
& 690004	ELECTRIC STARTING RECEPTACLE.....Add	14.50	1	.....
& 690292	GENERATOR. 12-Volt. Includes ammeter. Less battery cables.....Add	52.50	24	.....
& 690344	STARTING MOTOR. 12-Volt.....Add	150.00	30	.....
	Additional Equipment - Not Factory Installed			
& 690016	SAE NO. 2 FLYWHEEL HOUSING.....	45.00	80	.....
& 690169	SAE NO. 3 FLYWHEEL HOUSING.....	45.00	80	.....
& 690252	POWER UNIT LEGS. Front and rear. Requires flywheel housing.....	48.00	125	.....
& 690212	SIGHT OIL GAUGE.....	8.00	2	.....
& 690007	POWER TAKE-OFF. Includes housing, clutch and shaft. Requires No. 2 flywheel housing.....	192.00	150	.....
690275	BATTERY CABLES.....	5.75	2	.....
& 690315	HEAT EXCHANGER EXPANSION TANK.....	61.50	80	.....
	11A17296 Starting crank. Available from parts.			
	Battery: Recommend (two) 12-Volt, 11 plate, 72 ampere hour capacity.			

MINNEAPOLIS-MOLINE

Specifications Bulletin 1033 (3-67)

425A-6A
INDUSTRIAL POWER UNIT



GENERAL DESCRIPTION

The Minneapolis-Moline 425A-6A Power Unit is a 425.5 cubic inch engine capable of operating at 1500 RPM on continuous duty and 1600 RPM intermittent duty. At 1500 RPM this unit produces 94 horsepower with LP gas, 85 horsepower with natural gas and 96 horsepower with gasoline. This is a remarkably efficient, sturdy engine built to take long periods of punishing service. Approximate weight — stripped, but with PTO, legs and instruments... 2,150 lbs.

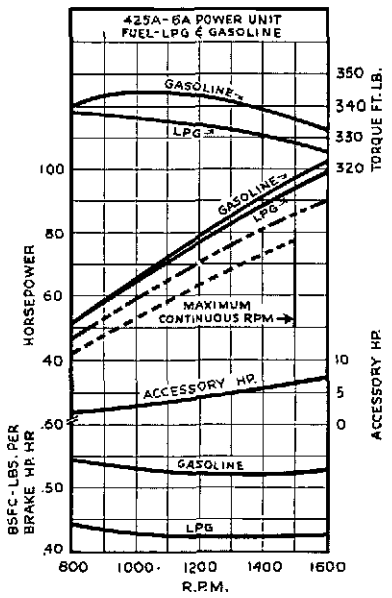
ECONOMICAL DESIGN—heavy crankcase with blocks and heads cast in pairs.

FULL PRESSURE LUBRICATION THROUGHOUT—oil system joined with gear lube pump that delivers 6.6 gpm at 30 psi at 1600 RPM.

COOL RUNNING ENGINE—controlled cooling system—large capacity water pump flows 45 gallons per minute at 1500 rpm.

HEAVY CRANKSHAFT AND CONNECTING ROD DESIGN—with precision inserts.

PERFORMANCE



FOR STRIPPED ENGINES:

——————— Maximum Output— (29.92" Hg. & 60°F.)

— — — — — Intermittent Rating

- - - - - - - - - Continuous Rating

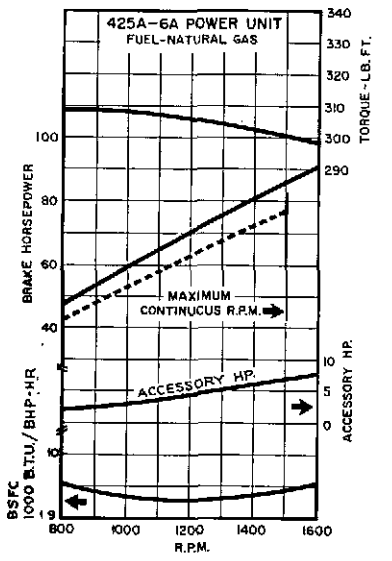
NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

NOTE: Natural Gas performance run with fuel HHV=1000 BTU/FT.^{3}; Fuel Consumption based on LHV=900 BTU/FT.^{3}.

LPG performance run with HD5 or equivalent Quality. Gasoline performance run with regular grade fuel.



STANDARD EQUIPMENT

Water pump and oil pump.
Manifolds and carburetor.
Oil filter and governor.
Oil bath air cleaner
Magneto spark plugs and cables.
Distributor spark plugs and cables.
Instrument panel and controls.
SAE No. 2 flywheel housing.
Power unit legs—front and rear. Requires 690060 housing.
PTO clutch and clutch shaft. Requires No. 2SAE housing.

ADDITIONAL EQUIPMENT

(Factory Installed Only)

Radiator and fan.
Pressure type radiator cap.
Enclosures.
Fan guard.
Starting motor, 12 volt.
Generator, 12 volt.
Distributor ignition, 12 volt.
Hoist controls.
Combination carburetor.
Variable speed governor.
Heat exchanger base pan.
Electric starting receptacle.
Stack type air cleaner.
Automatic oil level control.
Safety switches. Magneto ignition—Murphy.
Safety switches. Distributor ignition—Murphy.
Pusher type fan. Requires fan guard 690013. Replaces standard fan.
Remote instrument panel.
Hourmeter, 12 volt.
Watercooled manifolds.
Radiator and fan. Water cooled manifolds.
Bendix Scintilla,(S6RN-401) Magneto in place of Std.
Low tension magneto. Fairbanks Morse. In place of standard magneto.
AC fuel pump.
Fuel tank.

(Not Factory Installed)

Battery cables.
SAE No. 2 flywheel housing.
Legs, front and rear.
Heat exchanger expansion tank.
Enclosures.
Sight oil gauge.
Electric tachometer for magneto ignition.
LP gas vaporizer—Ensign R.
Brackets, tubing and fittings (for mounting R vaporizer).
LP gas vaporizer (Ensign Model M) for remote mounting.
Natural gas regulator with filter and fittings.
PTO clutch and clutch shaft. Requires SAE No. 2 flywheel housing.
Radiator and fan. Standard manifolds.
Electric tachometer distributor ignition.
Weather protective elbow.

425A-6A POWER UNIT

SPECIFICATIONS

GENERAL:
Bore and stroke ..... 4¼" x 5"
Number of cylinders 6
Piston displacement—cu. in. 425.5
R.P.M. at piston speed of 1250 F.P.M. 1500
Rotation—flywheel end ..... ccw
Maximum corrected H.P. at 1500 R.P.M.—
natural gas 85

	Gasoline	N.G.	L.P.G.
Compression ratio	6.9:1	8.3:1	8.3:1
Compression pressure psi.	150	185	185

CRANKSHAFT:
Rotation, facing flywheel end ..... *Counterclockwise*
Material ..... Drop-forged steel, heat-treated
Type ..... Counterbalanced
Bearings and material ..... Steel shell, tri-metal, precision
Size
Front ..... 2-29/32" D. x 2-3/16"
Intermediate ..... *Two 2-29/32" D. x 2-7/16"*
Rear ..... 2-29/32" D. x 3½"

CYLINDERS:
Removable cylinder blocks ..... Cast in pairs
Material ..... Special alloy, cast iron

CONNECTING RODS:
Style ..... Forged I-section
Material ..... *Drop-forged steel*
Bearings, size ..... 2-37/64" D. x 2-7/32"
Material ..... Steel shell, tri-metal, precision type

PISTONS
Material ..... Cast iron
Rings, number 4
Compression ..... Three, 5/32" wide
Oil ..... One, ¼" wide
Pins, type ..... Full-floating
Bearing size ..... 1¼" D. x 1¾"
Bushing material ..... Steel shell, bronze-lined

PISTONS
Material ..... Cast Iron
Rings, number 5
Top compression (1) ..... Chrome-plated, 3/32" wide
Compression (2) ..... 3/32" wide
Oil (1 above and 1 below pin) ..... 3/16" wide
Pins, type ..... Full-floating
Bearings (in rod), size ..... 1½" D. x 1¾"
Material ..... *Steel shell, bronze-lined*

CAMSHAFT:
Material ..... Cast Proferall metal
Number of bearings 4
Drive ..... Helical gear

VALVES AND VALVE MECHANISM:
Arrangement ..... In head
Tappets, type ..... Barrel and ported
Material ..... Chilled cast iron
Intake valves, port diameter
and material ..... 1½", alloy steel
Exhaust valves, port diameter
and material ..... 1⅜", alloy steel
Valve seat inserts (exhaust only) ..... *Stellite*
Valve guides ..... Extra long, replaceable

IGNITION
Magneto ..... Heavy-duty, flange-mounted
Spark plugs ..... 18 mm

OILING SYSTEM:
Pump, type and location ..... Gear, submerged in sump
Capacity ..... *6 gpm @ 30 psi @ 1600 rpm*
Filter ..... Replacement cartridge
Pressure points—
Rod, main and camshaft bearings, timing gears, valve mechanism, governor.
Crankcase capacity, standard base pan ..... 14 quarts
With heat exchanger base pan ..... 24 quarts
Oil level gauge ..... Bayonet
Pressure gauge ..... On instrument panel

CRANKCASE VENTILATION:
Breather ..... Oil wash
Ventilators ..... Metering valve connected to intake manifold

FUEL SYSTEM:
Carburetor, gasoline ..... 1½" Zenith
Carburetor, natural or LP gas ..... 1½" Ensign

COOLING SYSTEM:
Capacity ..... 12½ gallons
Pump, type and drive ..... Centrifugal, gear-driven
Capacity ..... 45 gpm at 1500 rpm
Water by-pass ..... Thermostatically controlled
Fan, size and type ..... 22", 4-blade
Bearings ..... Tapered roller
Drive ..... V-belt
Radiator, core ..... Tubular, lead-coated
Tanks ..... Cast iron top and bottom
Grille ..... Heavy punched steel
Water temperature control ..... *Thermostat*
Temperature indicator ..... On instrument panel

POWER TAKE-OFF:
Clutch ..... 11½" twin disc
Clutch shaft ..... 6½" long x 2¼" D. with ⅝" x 5/16" keyway
Clutch housing ..... S.A.E. No. 2 with 2 inspection covers
Flywheel housing ..... S.A.E. No. 2 flange
Outboard bearing ..... Two tapered-roller bearings
Pilot bearing ..... Double row ball
Lubrication ..... Pressure gun to pilot, clutch throwout, and outboard bearings
Engaging lever ..... Mounted on either side of unit

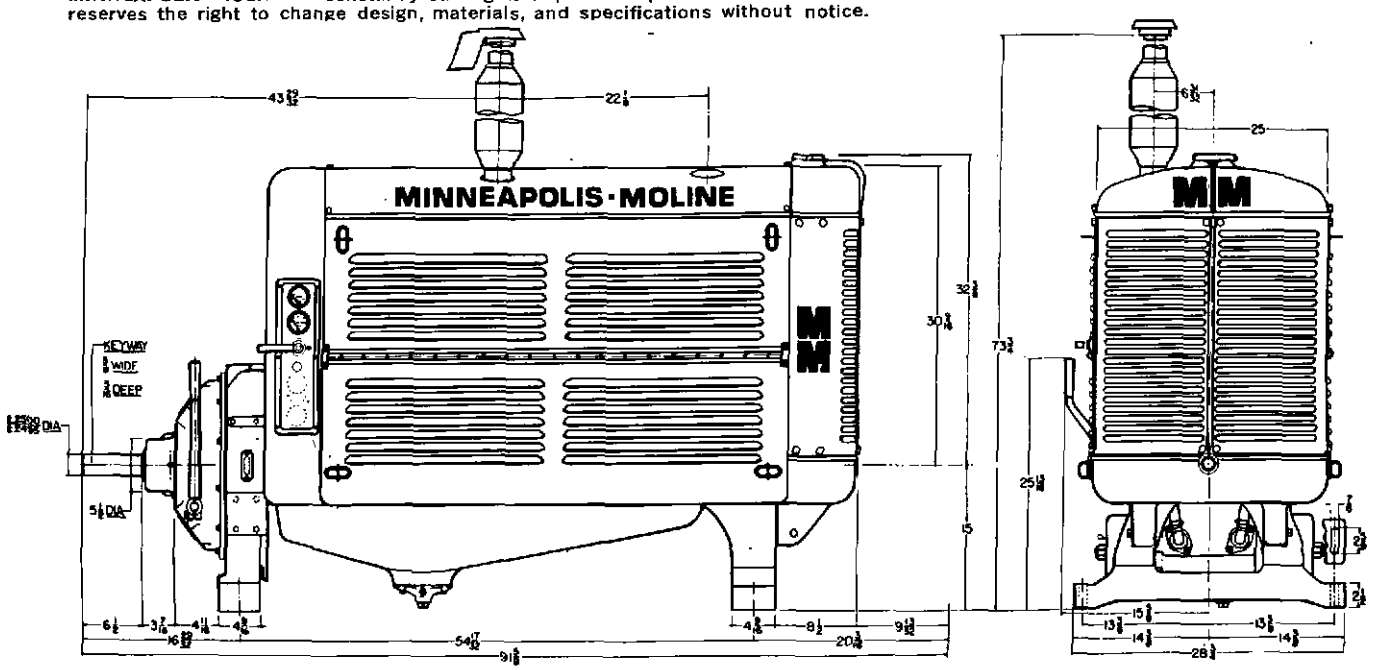
INSTRUMENT PANEL:
Panel ..... Enclosed mounted on either side of unit
Instruments and controls—
Water temperature gauge, oil pressure gauge, hand throttle and ignition switch. Provision for ammeter, starter button, hourmeter and starting receptacle.

ENCLOSURES:
Hood—
Formed of heavy gauge steel, hinged at center, and securely bolted in place.
Side covers—
Heavy gauge steel hinged at center, and entirely removable. Top half may be folded down or bottom folded up and latched in place.
Rear cover ..... Reinforced heavy gauge steel

SAFETY EQUIPMENT (Optional):
Oil pressure switch—
Grounds magneto if oil pressure drops safe limit
Water temperature switch—
Grounds magneto if temperature exceeds safe limit

MISCELLANEOUS:
Governor ..... Gear driven flyball
Muffler ..... *Low-resistance*
Air cleaner ..... Oil bath
Electric starting equipment ..... 12 volt
Electric starting receptacle ..... Plug-in type
Tachometer drive ..... Electrical

MINNEAPOLIS-MOLINE is constantly striving to improve its products and therefore reserves the right to change design, materials, and specifications without notice.



MINNEAPOLIS-MOLINE®

MM® *Long Life Engines*

SOLD AND SERVICED BY:

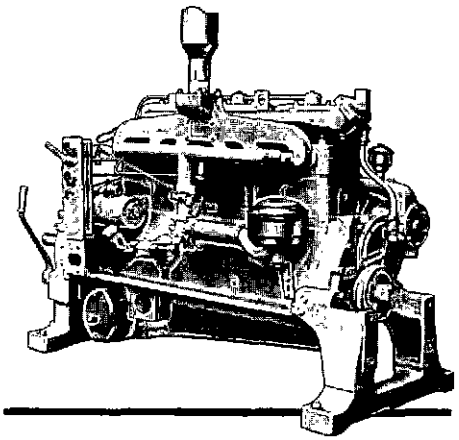
MINNEAPOLIS-MOLINE, INC., Hopkins, Minnesota
A Subsidiary of WHITE MOTOR CORPORATION

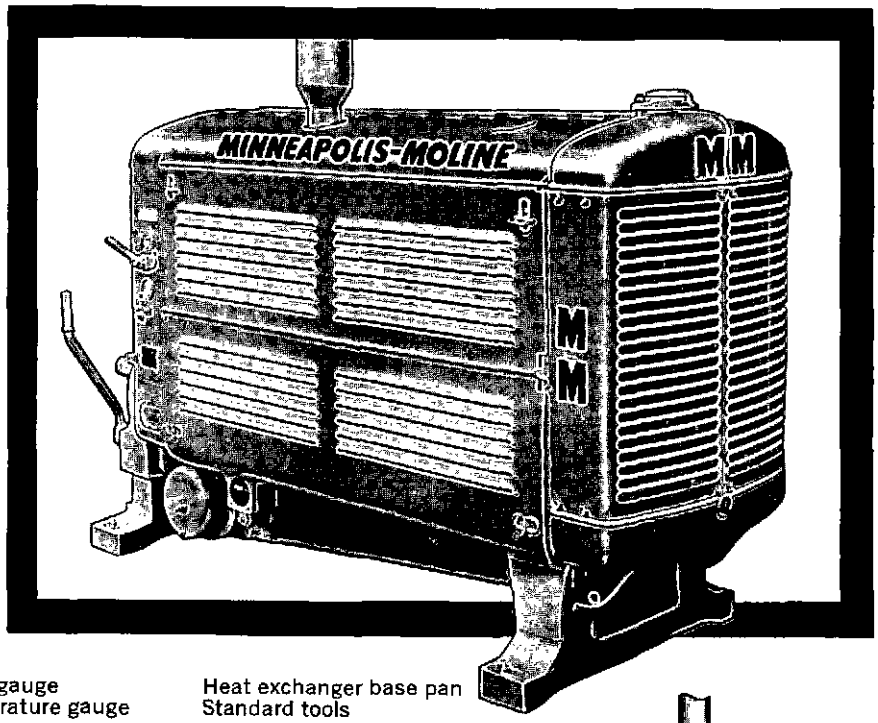
5-64 Printed in U.S.A.

MINNEAPOLIS-MOLINE

BULLETIN NO. 1030 (2-64)

OIL FIELD POWER UNIT 425A-6A





GENERAL DESCRIPTION

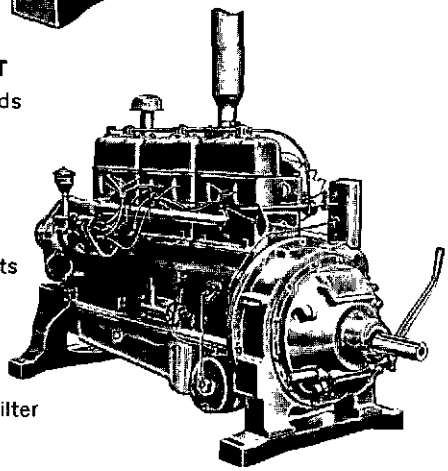
TYPE.....6 CYLINDER VALVE-IN-HEAD
BORE.....4¼ INCHES
STROKE.....5 INCHES
PISTON DISPLACEMENT.....425.5 CU. IN.
R.P.M. AT 1,250 FT. P.S......1,500
APPROXIMATE WEIGHT.....2600 LBS.

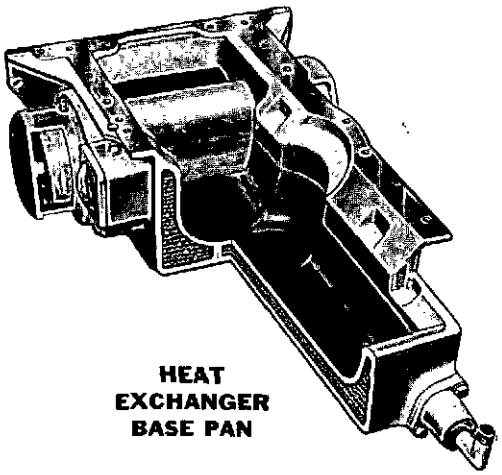
STANDARD EQUIPMENT

Sheet metal enclosures
Hinged hood
Folding side doors
Legs, front and rear
Radiator and Fan assembly
Radiator pressure cap
Instrument panel and controls
S.A.E. No. 2 flywheel housing
Muffler
Power take-off, housing, clutch
Twin disc clutch
Manifolds and carburetor
Heavy-duty magneto
Built-in governor
Oil pump and water pump
Oil pressure gauge
Water temperature gauge
Sight oil gauge
Water thermostat, by-pass
Water temperature cutout
Oil pressure cutout
Oil filter, 2 replaceable cartridges
Oil bath air cleaner
Vacuum crankcase ventilation
Flywheel, fan drive pulley
Flywheel ring gear
Exhaust valve seat inserts, Stellite
Starter motor, 12-volt
Plug-in starting receptacle
Fan guard
Spark plugs and cables
Heat exchanger base pan
Standard tools

ADDITIONAL EQUIPMENT

High altitude cylinder heads
Generator, 12-volt
Stack-type air cleaner
Combination natural gas-gasoline carburetor
Automatic oil level control
Pusher-type fan
Distributor ignition, 12 volts
Low tension magneto ignition—F.M.
Hour meter
Electric tachometer
Water-cooled manifolds
Natural gas regulator and filter
Battery cables

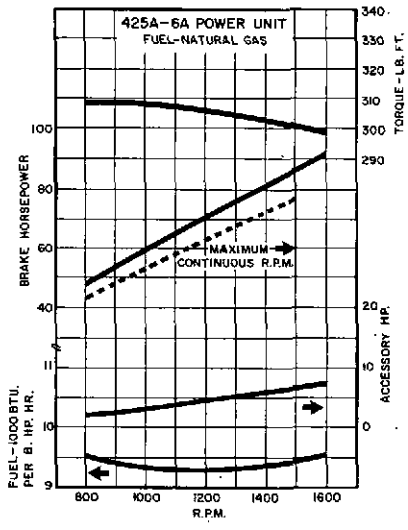




HEAT EXCHANGER BASE PAN

Water pump circulates engine water through base pan to maintain uniform engine and oil temperature. Results in quicker warm-up, less sludge, fewer oil changes, longer engine life.

PERFORMANCE



FOR STRIPPED ENGINES:

——— Maximum Output—(29.92" Hg & 60°F.)
——— Intermittent Rating (same as maximum)
- - - - - - - - Continuous Rating

NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

SPECIFICATIONS FOR 425A-6A OIL FIELD POWER UNIT

GENERAL:
- Bore and stroke: 4¼" x 5"
- Number of cylinders: 6
- Piston displacement—cu. in.: 425.5
- *R.P.M. at piston speed of 1250 F.P.M.*: *1500*
- Rotation—flywheel end: ccw
- Maximum corrected H.P. at 1500 R.P.M.—natural gas: 80
- Compression ratio: 8.3:1
- *Compression pressure psi*: 185

CRANKSHAFT:
- Rotation, facing flywheel end: Counterclockwise
- Material: Drop-forged steel, heat-treated
- Type: Counterbalanced
- Bearings and material: Steel-backed tri-metal
- Size: precision
  - Front: 2-29/32" D. x 2-3/16"
  - Intermediate: Two 2-29/32" D. x 2-7/16"
  - Rear: 2-29/32" D. x 3½"

CYLINDERS:
- Removable cylinder blocks: Cast in pairs
- Material: Special alloy, cast iron

CONNECTING RODS:
- Style: Forged I-section
- Material: Drop-forged steel
- Bearings, size: *2-37/64" D. x 2-7/32"*
- Material: Steel-backed tri-metal precision type

PISTONS
- Material: Cast iron
- Rings, number: 4
  - *Compression*: *Three, 5/32" wide*
  - Oil: One, ¼" wide
- Pins, type: Full-floating
- Bearing size: 1¼" D. x 1¾"
- Bushing material: Steel shell, bronze-lined

CAMSHAFT:
- Material: Cast Proferall metal
- Number of bearings: 4
- Drive: Helical gear

VALVES AND VALVE MECHANISM:
- Arrangement: In head
- Tappets, type: Barrel and ported
- Material: Chilled cast iron
- Intake valves, port diameter and material: 1½", alloy steel
- Exhaust valves, port diameter *and material*: *1⅜", alloy steel*
- Valve seat inserts (exhaust only): Stellite
- Valve guides: Extra long, replaceable

IGNITION
- Magneto: Heavy-duty, flange-mounted
- Spark plugs: 18 mm

OILING SYSTEM:
- Pump, type and location: Gear, submerged in sump
- Capacity: 6 gpm @ 30 psi @ 1600 rpm
- Filter (two): Replacement cartridge submerged in base pan
- *Pressure points*—
  - Rod, main and camshaft bearings, timing gears, valve mechanism, governor.
- Crankcase capacity with heat exchanger base pan: 24 quarts
- Oil level gauge: Bayonet
- Pressure gauge: On instrument panel

CRANKCASE VENTILATION:
- Breather: Oil wash
- Ventilators: Metering valve connected to intake manifold

FUEL SYSTEM:
- Carburetor: 1½" Ensign

COOLING SYSTEM:
- Capacity: 12½ gallons
- Pump, type and drive: Centrifugal, gear-driven
- *Capacity*: *45 gpm at 1500 rpm*
- Water by-pass: Thermostatically controlled
- Fan, size and type: 22", 4-blade
- Bearings: Tapered roller
- Drive: V-belt
- *Radiator, core*: *Tubular, lead-coated*
- Tanks: Cast iron top and bottom
- Grille: Heavy punched steel
- Water temperature control: Thermostat
- Temperature indicator: On instrument panel

POWER TAKE-OFF:
- Clutch: 11½" twin disc
- Clutch shaft: 6½" long x 2¼" D. with ⅝" x 5/16" keyway
- Clutch housing: S.A.E. No. 2 with 2 inspection covers
- Flywheel housing: S.A.E. No. 2 flange
- Outboard bearing: Two tapered-roller bearings
- Pilot bearing: Double row ball
- Lubrication: Pressure gun to pilot, clutch throwout, and outboard bearings
- Engaging lever: Mounted on either side of unit

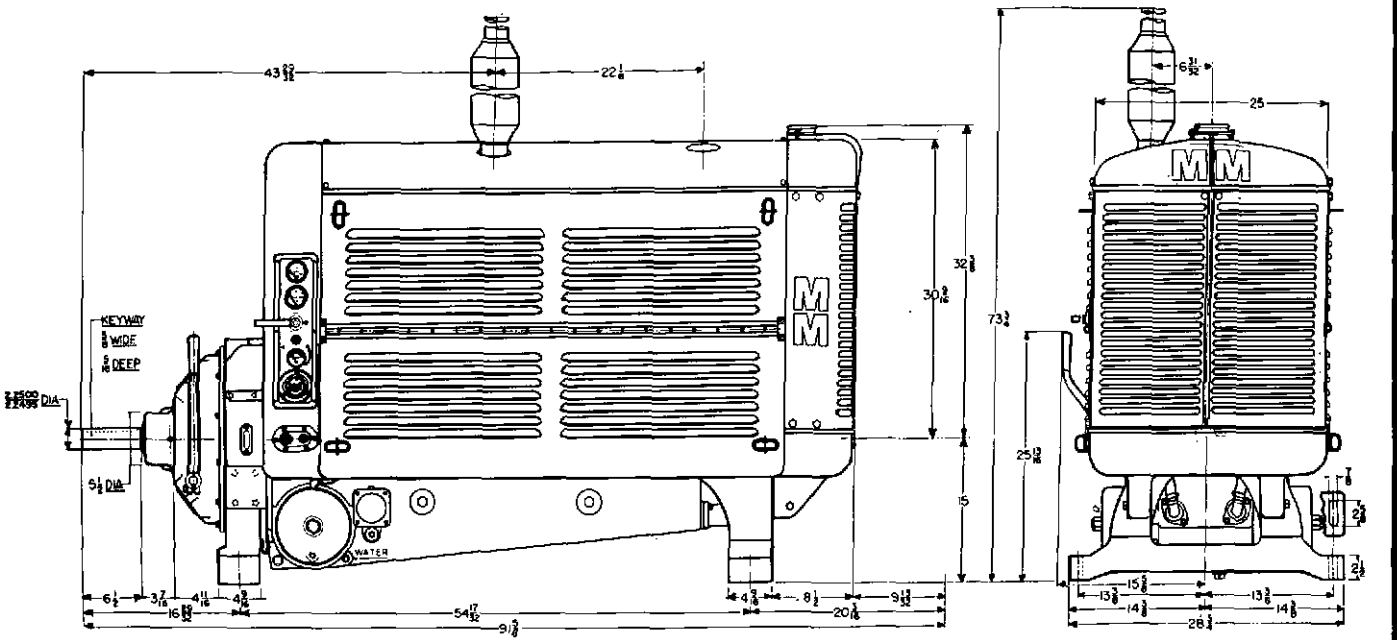
INSTRUMENT PANEL:
- Panel: Enclosed mounted on either side of unit
- Instruments and controls—
  - Water temperature gauge, oil pressure gauge, hand throttle and ignition switch. Provision for ammeter, starter button, hourmeter and starting receptacle.

ENCLOSURES:
- Hood—
  - Formed of heavy gauge steel, hinged at center, and *securely bolted in place.*
- Side covers—
  - Heavy gauge steel hinged at center, and entirely removable. Top half may be folded down or bottom folded up and latched in place.
- *Rear cover*: Reinforced heavy gauge steel

SAFETY EQUIPMENT (Optional):
- Oil pressure switch—
  - Grounds magneto if oil pressure drops safe limit
- *Water temperature switch*—
  - Grounds magneto if temperature exceeds safe limit

MISCELLANEOUS:
- Governor: Gear driven flyball
- *Muffler*: *Low-resistance*
- Air cleaner: Oil bath
- Electric starting equipment: 12 volt
- Electric starting receptacle: Plug-in type
- Tachometer drive: Electrical
- Crankcase oil level: Automatic oil flow controller
- Manifolds: Water cooled

MINNEAPOLIS-MOLINE is constantly striving to improve its products and therefore reserves the right to change design, materials, and specifications without notice.



SOLD AND SERVICED BY:

MINNEAPOLIS-MOLINE, INC.
Hopkins, Minnesota

Printed in U.S.A.

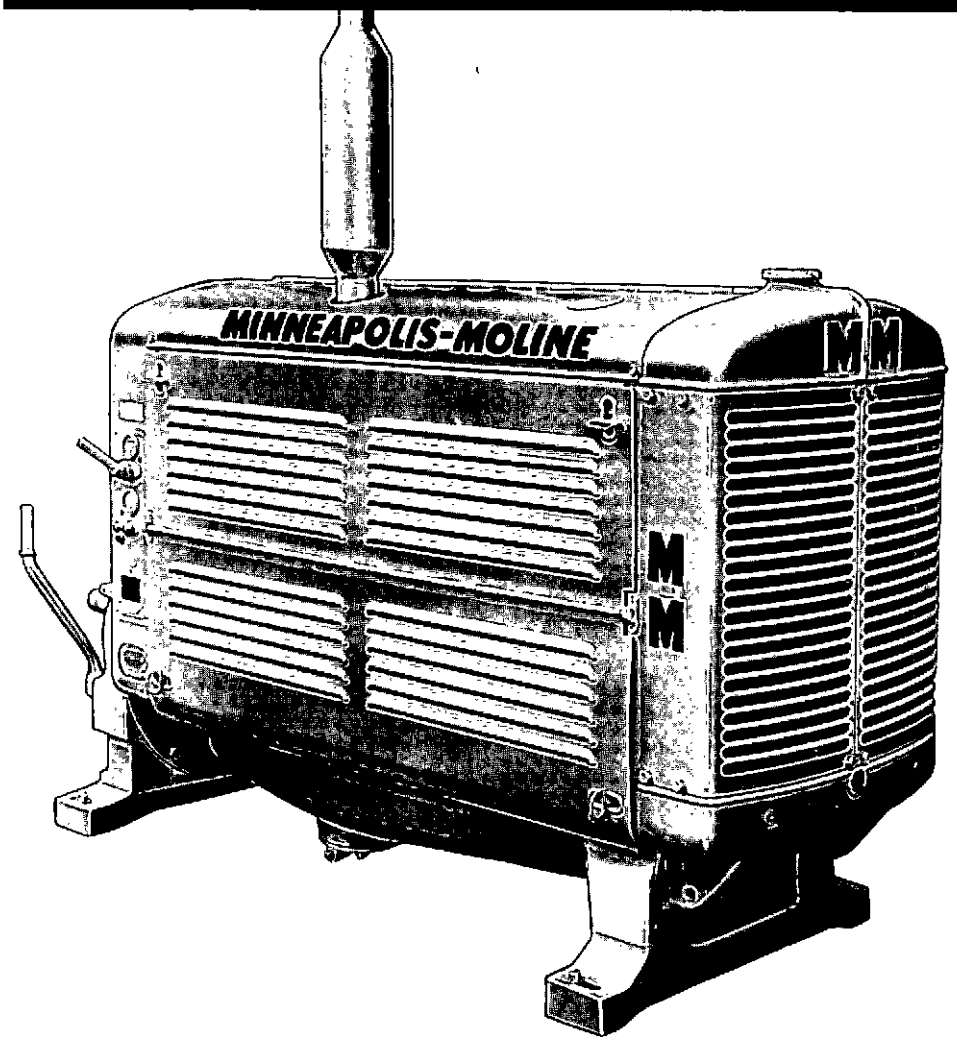
CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	425A-6A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Standard Equipment			
	4-1/4x5 6-cylinder Moline engine. Manifolds. Carburetor. Water pump. Oil pump. Oil filter. Oil bath air cleaner. Governor. Magneto. Spark plugs and cables. Flywheel and ring gear. Fan drive pulley. Muffler. By-pass thermostatic valve with by-pass line. Manifold vacuum crankcase ventilation. SAE No. 2 flywheel housing. Leg base. Instrument panel with controls. Water temperature gauge. Oil pressure gauge. Power take-off with 11-1/2-inch Twin-Disc clutch and shaft. Hand crank. Shipping skid.			
& 651111	425A-6A POWER UNIT. For gasoline, sea level to 4000 feet.....Comp. Ratio 6.9:1	1934.00	2150	.....
& 651121	425A-6A POWER UNIT. For gasoline, 4000 feet to 8000 feet.....7.5:1	1952.00	2150	.....
& 651411	425A-6A POWER UNIT. For natural or LP gas, sea level to 4000 feet..8.3:1	1894.00	2150	.....
& 651421	425A-6A POWER UNIT. For natural or LP gas, 4000 feet and up.....9.3:1	1912.00	2150	.....
& 651431	425A-6A POWER UNIT. For natural or LP gas, sea level to 4000 feet. With water-cooled manifolds.....8.3:1	2015.00	2190	.....
	NOTE: Power unit does not include radiator and fan or inclosures. See Additional Equipment.			
	NOTE: Natural gas or LP gas units require a regulator or vaporizer to complete. See Additional Equipment.			
	Additional Equipment - Factory Installed Only			
690167	SAFETY CUT-OUTS. (Murphy). For magneto ignition. Includes water temperature and oil pressure gauges in place of standard.....Add	19.75	2	.....
690168	SAFETY CUT-OUTS. (Murphy). For distributor ignition. Includes water temperature and oil pressure gauges in place of standard.....Add	29.00	2	.....
690111	HOURMETER. 12-Volt.....Add	33.25	2	.....
+ 690141	VACUUM GAUGE. With shut-off valve. (Mounts on intake manifold).....Add	11.00	3	.....
& 690088	HOIST CONTROLS. For gasoline units with magneto ignition. Requires radiator and fan and inclosures.....Add	62.50	30	.....
& 690078	COMBINATION CARBURETOR. Natural gas-gasoline or LP gas-gasoline. In place of gasoline carburetor.....Add	36.00	5	.....
& 690133	AC FUEL PUMP. For gasoline.....Add	21.50	5	.....
& 690067	FUEL TANK. 20 Gallon.....Add	70.00	65	.....
& 690008	LESS POWER TAKE-OFF. Includes housing, clutch and shaft.Not Wanted, Deduct	134.00	150	.....
+ 690328	RADIATOR AND FAN. For standard manifolds. With pressure cap.....Add	200.00	239	.....
+ 690329	RADIATOR AND FAN. For water-cooled manifolds. With pressure cap.....Add	315.00	258	.....
# 690049	RADIATOR AND FAN. For standard manifolds.....Add	191.00	236	.....
# 690050	RADIATOR AND FAN. For water-cooled manifolds.....Add	306.00	255	
& 690082	PRESSURE TYPE RADIATOR CAP. For use with 690049 or 690050.....Add	9.00	3	.....
& 690072	PUSHER TYPE FAN. In place of standard. Requires 690013 fan guard. 690082 pressure type radiator cap recommended.....Add	6.00	-	.....
& 690013	FAN GUARD.....Add	26.00	7	.....
& 690051	INCLOSURES. Includes hood, rear hood support and hinged side covers..Add	92.00	85	.....

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	425A-6A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Additional Equipment - Factory Installed Only (Continued)			
& 690004	ELECTRIC STARTING RECEPTACLE.....Add	14.50	1	.....
& 690132	GENERATOR. 12-Volt. Includes ammeter. Less battery cables.....Add	52.50	24	.....
& 690126	STARTING MOTOR. 12-Volt. Includes switch.....Add	87.00	40	.....
& 690065	STARTING EQUIPMENT. 12-Volt. Includes generator and battery cables. For use with 690088 hoist control only.....Add	146.00	70	.....
+ 690250	MAGNETO. Low tension. In place of standard magneto.....Add	98.50	-	.....
690038	MAGNETO. Bendix-Scintilla S6RN-401. In place of standard magneto.....Add	5.25	-	.....
& 690098	12-VOLT DISTRIBUTOR IGNITION. In place of magneto ignition.....Deduct	43.00	-	.....
& 690123	STACK AIR CLEANER. In place of standard. For use with standard manifolds only.....Add	26.00	10	.....
& 690039	VARIABLE SPEED GOVERNOR. In place of standard.....Add	5.00	1	.....
& 690041	HEAT EXCHANGER BASE PAN. In place of standard. Includes dual 6-1/2 x 9-inch filter.....Add	167.00	100	.....
& 690099	AUTOMATIC OIL LEVEL CONTROL. For use with heat exchanger base pan.....Add	21.00	1	.....
	Additional Equipment - Not Factory Installed			
& 690068	SAE NO. 2 FLYWHEEL HOUSING.....	66.00	115	.....
& 690069	*LEGS. For No. 2 and No. 3 flywheel housings*.....	11.50	32	.....
& 690012	SIGHT OIL GAUGE.....	8.00	2	.....
690097	ELECTRIC TACHOMETER. For magneto ignition.....	70.50	5	.....
& 690074	NATURAL GAS REGULATOR. Includes screen and fittings.....	48.50	15	.....
690119	LP GAS VAPORIZER. (Ensign Model "R"). Includes filter. Requires 690121 to install.....	101.00	25	.....
& 690121	BRACKETS, FITTINGS AND TUBING.....	13.50	10	.....
690076	LP GAS VAPORIZER. (Ensign Model "M"). Includes filter. Requires 690131 to install.....	106.00	27	.....
690131	BRACKETS, FITTINGS AND TUBING.....	17.75	10	.....
& 690007	POWER TAKE-OFF. Includes housing, clutch and shaft.....	192.00	150	.....
690023	RADIATOR AND FAN. With starting crank. For units with standard manifolds..	223.00	248	.....
& 690066	INCLOSURES. Includes hood, support and side covers.....	97.50	85	.....
690083	BATTERY CABLES.....	4.75	2	.....
& 690148	WEATHER PROTECTIVE ELBOW. For muffler.....	3.00	6	.....
& 690315	HEAT EXCHANGER EXPANSION TANK.....	61.50	80	.....
	Battery: Recommend (two) 12-Volt, 11 plate, 72 ampere hour capacity.			

MINNEAPOLIS-MOLINE

Specifications Bulletin 1053 (3-67)

D425-6A
INDUSTRIAL POWER UNIT
(Diesel)



ECONOMICAL DESIGN—heavy crankcase with blocks and heads cast in pairs.

FULL PRESSURE LUBRICATION THROUGHOUT—oil system joined with gear lube pump that delivers 6 gpm at 30 psi at 1600 RPM.

COOL RUNNING ENGINE—controlled cooling system—large capacity water pump flows 45 gallons per minute at 1500 rpm.

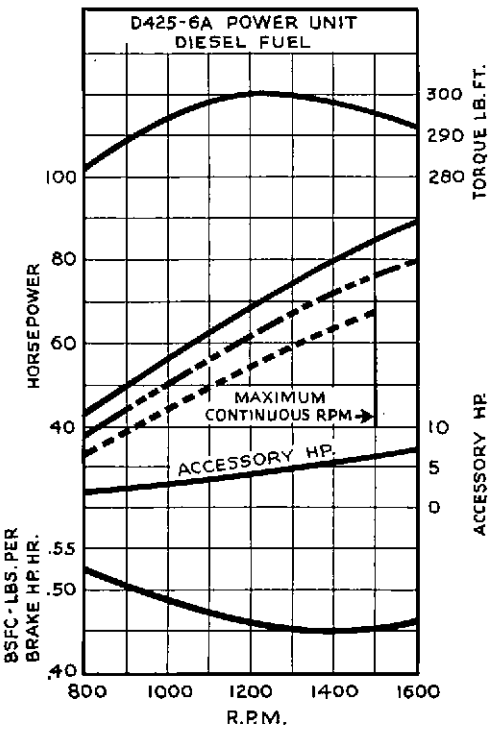
HEAVY CRANKSHAFT AND CONNECTING ROD DESIGN—with precision inserts.

GENERAL DESCRIPTION

The Minneapolis-Moline D425-6A Power Unit is a 425.5 cubic inch engine capable of operating at 1500 RPM on continuous duty and 1600 RPM intermittent duty. At 1500 RPM this unit produces 84 horsepower.

This is a remarkably efficient, sturdy engine built to take long periods of punishing service. Approximate weight — stripped, but with PTO, legs and instruments . . . 2,150 lbs.

PERFORMANCE



FOR STRIPPED ENGINES:

——————— Maximum Output— (29.92" Hg. & 60°F.)

— — — — — Intermittent Rating

- - - - - - - - Continuous Rating

NOTE: To determine allowable continuous or intermittent duty horsepower, at any altitude or temperature conditions, use the values as determined above or 95% of available BHP, whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine ratings of completely equipped units, deduct accessory H.P. from stripped engine curves.

NOTE: Diesel performance run with #2 diesel fuel.

STANDARD EQUIPMENT

- Sheet metal housing
- Folding side doors
- Radiator and fan with press. cap
- Muffler
- Power take-off with 11½" twin-disc clutch and shaft
- Manifolds
- Single plunger injection pump with internal governor
- High-pressure lines and nozzles
- Dual fuel filters
- Fuel transfer pump
- Oil pump
- Oil pressure gauge
- Water temperature gauge
- By-pass thermostatic valve with by-pass line
- Package water pump
- Dual full-flow oil filter
- Oil bath air filter
- Manifold crankcase ventilators
- Instrument panel
- Controls
- Flywheel and ring gear
- S.A.E. No. 2 flywheel housing
- Standard tools
- Leg base and shipping skid

ADDITIONAL EQUIPMENT

- Oil sight gauge
- Fan guard
- Pusher type fan
- Generator—12 volt
- Starting motor—12 volt
- Electric starting receptacle
- S.A.E. No. 3 flywheel housing
- Safety cutout gauges
- Fuel tank—20 gallon
- Battery cables
- Hour meter

SPECIFICATIONS FOR D425-6A INDUSTRIAL POWER UNIT

GENERAL:
- Bore and stroke: 4¼" x 5"
- Number of cylinders: 6
- Piston displacement—cu. in.: 425.5
- R.P.M. at piston speed of 1250 F.P.M.: 1500
- Rotation—flywheel end: ccw
- Maximum corrected H.P. at 1500 R.P.M natural gas:
- Compression ratio—Diesel: 14.9:1
- Compression pressure psi: 440

CRANKSHAFT:
- Rotation, facing flywheel end: Counterclockwise
- Material: Drop-forged steel, heat-treated
- Type: Counterbalanced
- Bearings and material: Steel shell, tri-metal, precision
- Size
  - Front: 2-29/32" D. x 2-3/16"
  - Intermediate: Two 2-29/32" D. x 2-7/16"
  - Rear: 2-29/32" D. x 3½"

CYLINDERS:
- Removable cylinder blocks: Cast in pairs
- Material: Special alloy, cast iron
- Controlled combustion: Lanova energy cells

CONNECTING RODS:
- Style: Forged I-section
- Material: Drop-forged steel
- Bearings, size: 2-29/32" D. x 2-5/64"
- Material: Steel shell, tri-metal, precision type

PISTONS
- Material: Aluminum
- Rings, number: 5
  - Top compression (1): Chrome-plated, 3/32" wide
  - Compression (2): 3/32" wide
  - Oil (1 above and 1 below pin): 3/16" wide
- Pins, type: Full-floating
  - Bearings (in rod), size: 1½" D. x 1¾"
  - Material: Steel shell, bronze-lined

CAMSHAFT:
- Material: Cast Proferall metal
- Number of bearings: 4
- Drive: Helical gear

VALVES AND VALVE MECHANISM:
- Arrangement: In head
- Tappets, type: Barrel and ported
- Material: Chilled cast iron
- Intake valves, port diameter and material: 1½", alloy steel
- Exhaust valves, port diameter and material: 1⅜", alloy steel
- Valve seat inserts (exhaust only): Stellite
- Valve guides: Extra long, replaceable

OILING SYSTEM:
- Pump, type and location: Gear, submerged in sump
- Capacity: 6.6 gpm @ 30 psi @ 1600 rpm
- Filter: Replacement cartridge
- Pressure points—
  Rod, main and camshaft bearings, timing gears, valve mechanism, governor and injection pump.
- Crankcase capacity: 14 quarts
- Oil level gauge: Bayonet
- Pressure gauge: On instrument panel

CRANKCASE VENTILATION:
- Breather: Oil wash
- Ventilators: Metering valve connected to intake manifold

FUEL SYSTEM:
- Injection pump: Roosamaster Distributor
- Injection nozzles: Pintle type
- Fuel filter: 2 parallel

COOLING SYSTEM:
- Capacity: 12½ gallons
- Pump, type and drive: Centrifugal, gear-driven
- Capacity: 45 gpm at 1500 rpm
- Water by-pass: Thermostatically controlled
- Fan, size and type: 22", 4-blade
- Bearings: Tapered roller
- Drive: V-belt
- Radiator, core: Tubular, lead-coated
- Tanks: Cast iron top and bottom
- Grille: Heavy punched steel
- Water temperature control: Thermostat
- Temperature indicator: On instrument panel

POWER TAKE-OFF:
- Clutch: 11½" twin disc
- Clutch shaft: 6½" long x 2¼" D. with ⅜" x 5/16" keyway
- Clutch housing: S.A.E. No. 2 with 2 inspection covers
- Flywheel housing: S.A.E. No. 2 flange
- *Outboard bearing: Two tapered-roller bearings*
- Pilot bearing: Double row ball
- Lubrication: Pressure gun to pilot, clutch throwout, and outboard bearings
- Engaging lever: Mounted on either side of unit

INSTRUMENT PANEL:
- Panel: Enclosed mounted on either side of unit
- Instruments and controls—
  Water temperature gauge, oil pressure gauge, hand throttle, Provision for ammeter, starter button, hourmeter and starting receptacle.

ENCLOSURES:
- Hood—
  Formed of heavy gauge steel, hinged at center, and securely bolted in place.
- Side covers—
  Heavy gauge steel hinged at center, and entirely removable. Top half may be folded down or bottom folded up and latched in place.
- Rear cover: Reinforced heavy gauge steel

SAFETY EQUIPMENT (Optional):
- Oil pressure switch—
  Stops engine if oil pressure drops below safe limit
- Water temperature switch—
  Stops engine if temperature exceeds safe limit

MISCELLANEOUS:
- Governor: With fuel injection pump
- Muffler: Low-resistance
- Air cleaner: Oil bath
- Electric starting equipment: 12 volt
- Electric starting receptacle: Plug-in type

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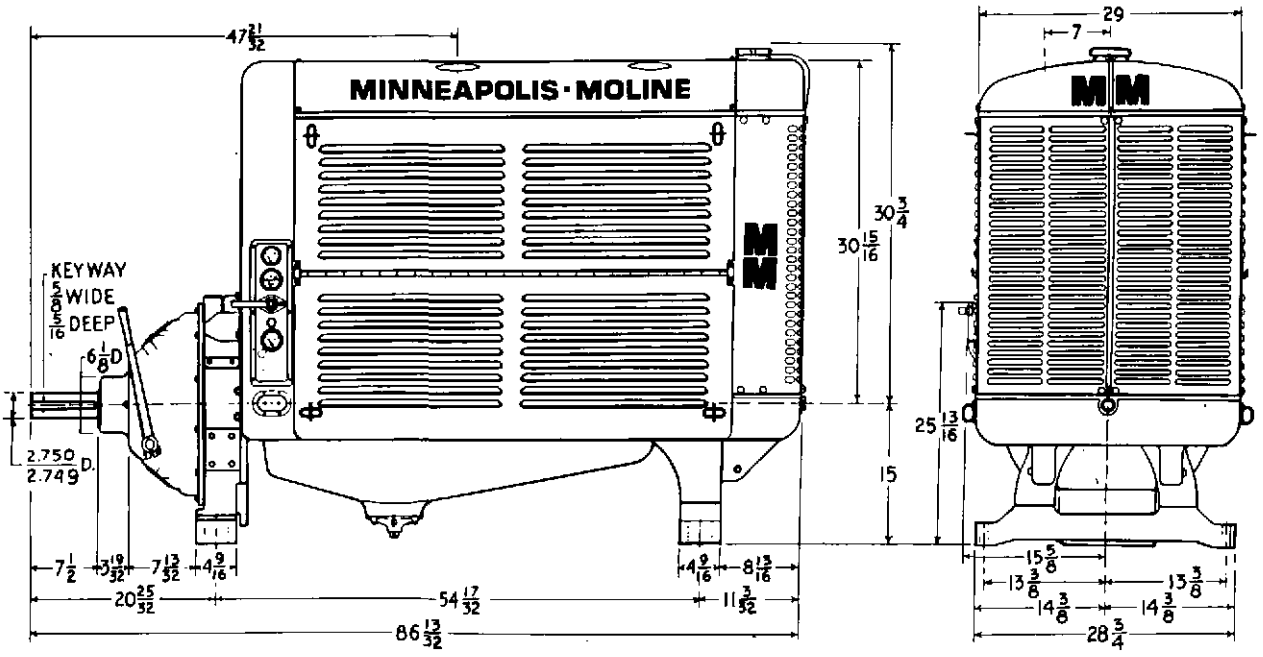


MINNEAPOLIS-MOLINE®

MM® *Long Life Engines*

MINNEAPOLIS-MOLINE, INC., Hopkins, Minnesota
A Subsidiary of WHITE MOTOR CORPORATION

SOLD AND SERVICED BY:

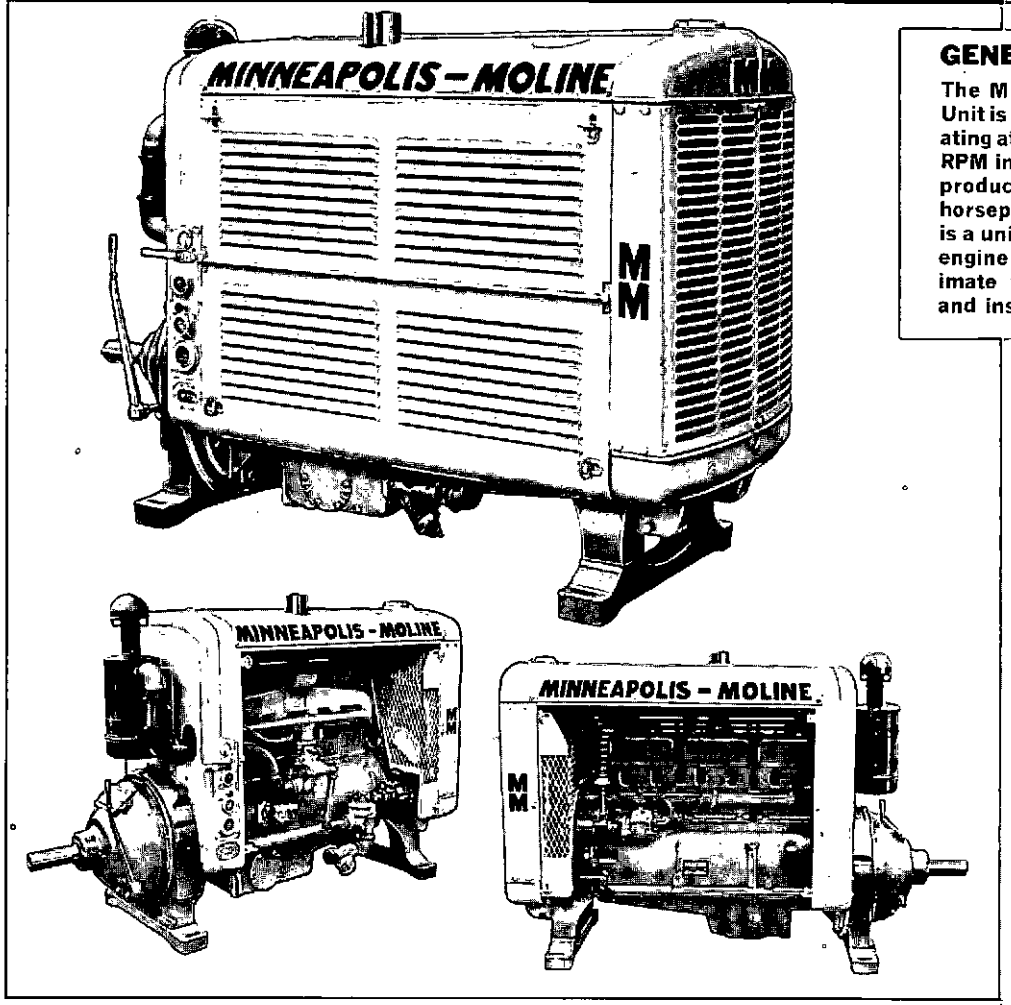
5-54 Printed in U.S.A.

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	D425-6A DIESEL POWER UNIT F.O.B. Minneapolis, Minnesota			
	Standard Equipment			
	4-1/4x5 6-cylinder Moline engine. Manifolds. Fuel filter. Fuel injection pump. Nozzles and high pressure lines. Water pump. Oil pump. Dual full-flow oil filter. Oil bath air cleaner. Flywheel and ring gear. Fan drive pulley. Muffler. By-pass thermostatic valve with by-pass line. Manifold crankcase ventilation. SAE No. 2 flywheel housing. Leg base. Instrument panel with controls. Oil pressure gauge. Water temperature gauge. Power take-off with 11-1/2-inch Twin-Disc clutch and shaft. Shipping skid.			
651711	D425-6A POWER UNIT	2646.00	2190	.....
	Additional Equipment - Factory Installed Only			
690124	SAFETY CUT-OUTS. Includes oil and temperature gauges in place of standard....Add	76.00	13	.....
690111	HOURMETER. 12-Volt....Add	33.25	2	.....
690104	FUEL TANK. 20 gallon....Add	79.00	65	.....
690008	LESS POWER TAKE-OFF. Includes housing, clutch and shaft. Not wanted, Deduct	134.00	150	.....
+ 690328	RADIATOR AND FAN. With pressure cap....Add	200.00	239	.....
# 690052	RADIATOR AND FAN....Add	203.00	270	.....
# 690082	PRESSURE TYPE RADIATOR CAP....Add	9.00	3	.....
690072	PUSHER TYPE FAN. In place of standard. Requires 690013 fan guard. 690082 pressure type radiator cap recommended....Add	6.00	-	.....
690013	FAN GUARD....Add	26.00	7	.....
690051	INCLOSURES. Includes hood, rear hood support and hinged side covers....Add	92.00	85	.....
690004	ELECTRIC STARTING RECEPTACLE....Add	14.50	1	.....
690132	GENERATOR. 12-Volt. Includes ammeter. Less battery cables....Add	52.50	24	.....
690096	STARTING MOTOR. 12-Volt. Includes switch....Add	168.00	51	.....
690127	STARTING MOTOR. 12-Volt. Includes solenoid switch....Add	180.00	55	.....
	Additional Equipment - Not Factory Installed			
690068	SAE NO. 2 FLYWHEEL HOUSING....	66.00	115	.....
690069	LEGS. For No. 2 flywheel housing....	11.50	32	.....
690012	SIGHT OIL GAUGE....	8.00	2	.....
690007	POWER TAKE-OFF. Includes housing, clutch and shaft....	192.00	150	.....
690103	RADIATOR AND FAN....	223.00	270	.....
690066	INCLOSURES. Includes hood, support and side covers....	97.50	85	.....
690083	BATTERY CABLES....	4.75	2	.....
+ 690315	HEAT EXCHANGER EXPANSION TANK....	61.50	80	.....
690148	WEATHER PROTECTIVE ELBOW. For muffler....	3.00	6	.....
	11A17296 Starting crank. Available from parts.			
	Battery: Recommend (three) 12-Volt, 11-plate, 72 ampere hour capacity.			

MINNEAPOLIS-MOLINE

Specifications Bulletin 1031 (1-67)

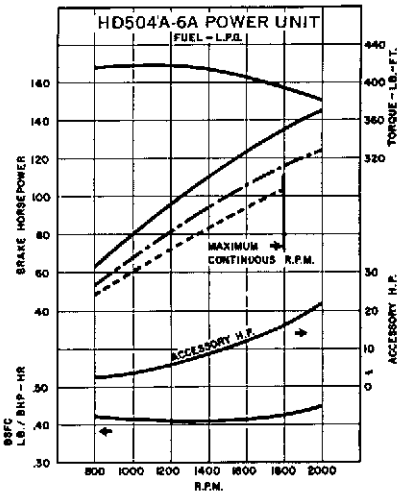
HD504A-6A
INDUSTRIAL POWER UNIT



GENERAL DESCRIPTION

The Minneapolis-Moline HD504A-6A Power Unit is a 504 cubic inch engine capable of operating at 1800 RPM on continuous duty and 2000 RPM intermittent duty. At 1800 RPM, this unit produces 136 horsepower with LP gas and 129 horsepower with natural gas. The HD504A-6A is a uniquely dependable, long life, heavy duty engine built for 24-hour-a-day service. Approximate weight—stripped, but with PTO, legs and instruments . . . 2400 lbs.

PERFORMANCE



FOR STRIPPED ENGINES:

——————— Maximum Output—(29.92" Hg. & 60°F.)
— — — — — — Intermittent Rating
- - - - - - - - - Continuous Rating

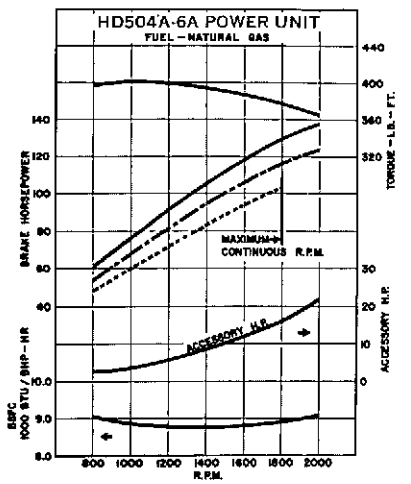
NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

NOTE: Natural Gas performance run with fuel HHV=1000 BTU/FT.^{3}: Fuel Consumption based on LHV=900 BTU/FT.^{3}.

LPG performance run with HD5 or equivalent quality. Gasoline performance run with regular grade fuel.



Economical design—heavy crankcase with blocks and heads cast in pairs . . . a Minneapolis-Moline exclusive.

Full pressure lubrication throughout—full flow oil system is joined with a large capacity gear lube pump that delivers 12 GPM @ 1800 RPM.

Cool running engine — large capacity water pump flows 95 GPM at 1800 RPM. Cooling system includes one-piece water outlet manifold, dual thermostats.

Heavy crankshaft and connecting rod design—with precision trimetal inserts, torsional vibration damper.

STANDARD EQUIPMENT

- Water pump and oil pump
- Manifolds and carburetor (NG & LP)
- Oil filter and governor
- Oil bath air cleaner
- Pressure cap
- Magneto (only) spark plugs and cables
- Distributor (only) spark plugs and cables
- Flywheel and ring gear
- Torsional damper fan drive pulley
- Positive crankcase ventilation
- Lifting eye. Muffler
- Thermostat and bypass

ADDITIONAL EQUIPMENT

(factory installed only)

- Instrument panel and controls.
- SAE No. 1 flywheel housing.
- Power unit legs, front and rear. Requires 690276 SAE housing.
- PTO clutch and clutch shaft. Requires 690276 SAE housing.
- Radiator and fan with pressure cap. Std. manifolds.
- Enclosures.
- Fan guard.
- Starting motor. 12 volt.
- Generator. 12 volt.
- Electric starting receptacle.
- Heat exchanger base pan. Includes dual 6½" x 9" filter.
- Dry type air cleaner (in place of standard oil bath).
- Automatic oil level control.
- Safety switches. Murphy, oil, temperature, and vacuum.
- Pusher type fan. Requires fan guard 690063. Replaces std. fan.
- Remote instrument panel.
- Natural gas regulator and filter with fittings.
- LP gas vaporizer (Ensign Model NS) requires 690247 to install.
- Brackets, fittings, and tubing.
- Bendix (S6RN-401) magneto in place of std.
- Low tension magneto in place of std. magneto.
- Impco-nat. gas or LPG Carb.-in place of Ensign.

(Not factory installed)

- Battery cables.
- SAE No. 2 flywheel housing.
- Heat exchanger expansion tank.
- LP gas vaporizer (Ensign Model NS). Requires 690255 to install.
- Brackets, fittings and tubing.

HD504A-6A POWER UNIT

SPECIFICATIONS

GENERAL:	Bore and stroke	4⅝x5	
	Number of cylinders	6	
	Piston displacement cu. in.	504	
	Rotation facing flywheel	CCW	
		NG	**LPG**
	*Maximum horsepower at 1800 RPM	129	136
	Compression Ratio	8.8:1	7.7:1
	Compression Pressure—PSI	200	175
CRANKSHAFT:	Shaft	Drop forged steel, heat treated and counter balanced	
	Number of bearings	4	
	Bearing type and material	Precision, Tri-metal	
	Front	2-29/32"x2-3/16"	
	Intermediate	(Two) 2-29/32"x2-7/16"	
	Rear	2-29/32"x3½"	
CYLINDERS:	Cast	In pairs	
	Material	Cast iron	
	Cylinder block	Removable	
CYLINDER HEADS:	Cast	In pairs	
	Material	Cast iron	
CONNECTING RODS:	Material	Drop forged steel	
	Style	Forged I section	
	Bearing size	2-29/32" dia. x 2-3/32"	
	Bearing type and material	Precision, Tri-Metal	
PISTONS:	Material	Alum. Alloy	
	Rings, number	4	
	compression	three 3/32" wide	
	oil	one 3/16" wide	
PISTON PIN:	Type	Full floating	
	Bearing size	1¼" dia. x 2"	
	Bushing material	Bronze, steel backed	
CAMSHAFT:	Material	Cast Proferall metal	
	Number of bearings	4	
	Drive	Helical gears	
VALVE AND VALVE MECHANISM:	*Arrangement*	*In head*	
	Intake valves	1-23/32" alloy steel	
	Exhaust valves	1-19/32" Stellite faced	
	Exhaust valve seats	Stellite	
	Tappet	Barrel type. Ported	
	Tappet material	Chilled cast iron	
IGNITION:	Magneto	Heavy-duty, flange mtd.	
	Spark plugs	18 MM	
OILING SYSTEM:	Pump	Submerged gear located in sump	
	Pump capacity	12 GPM @ 1800 RPM	
	Filter	Replaceable cartridge type, in base pan	
	Pressure points	Rod, main and camshaft bearings, timing gears, valve mechanism and governor	
	Crankcase capacity	6 gallons	
	Oil level gauge	Bayonet and sight glass	
	Pressure gauge	On instrument panel	
CRANKCASE VENTILATION:	Breather	Oil wash	
	Ventilator	Vacuum metering valve connected to intake manifold	
FUEL SYSTEM:	Carburetor	LPG or Nat. Gas 1¾" Ensign Impco Carb. Optional	
COOLING SYSTEM:	Pump	Centrifugal gear driven 95 GPM @ 1800 RPM	
	Coolant by-pass	Thermostatically controlled	
	Fan	24" dia.—6 blades on tapered roller bearings	
	Fan and belt guard	Detachable steel mesh	
	Fan Drive	Two V belts	
	Capacity with standard equipment	17.5 gal.	
	Radiator core	Tubular, lead coated	
	Tanks	Cast iron top and bottom	
	Radiator grille	Heavy punched steel	
	Coolant temperature	Thermostatically controlled pressure system	
POWER TAKE-OFF:	Clutch	14" twin disc	
	Shaft	2¾" dia. w/⅜"x5/16" key way	
	Flywheel housing	SAE No. 1 flange	
	Power take-off	SAE No. 1 (two inspection covers)	
	Power take-off shaft bearings	*(Two) Tapered roller*	
	Pilot bearing	Double row ball	
	Lubrication	Pressure gun to pilot, clutch throwout and shaft bearings	
	Shifter lever	Can be mounted on either side	
INSTRUMENT PANEL:	Panel	Enclosed, mounted on either side of unit	
	Instruments and controls—	Water temperature gauge, oil pressure gauge, hand throttle and ignition switch. Provision for ammeter, starter button and starting cable receptacle.	
ENCLOSURES:	Hood	Formed of heavy gauge steel, hinged at center	
	Side Covers—	Heavy gauge steel, hinged at center and entirely removable. Top half may be folded down or bottom folded up and latched in place.	
	Rear cover	*Reinforced heavy gauge steel*	
SAFETY EQUIPMENT:	Oil pressure switch—grounds magneto if oil pressure drops below safe limit. Water temperature switch—grounds magneto if temperature exceeds safe limit.		
MISCELLANEOUS:	Governor	Gear driven flyball	
	Muffler	Low resistance	
	Air cleaner	Rear mounted stack type oil bath standard. "Cyclopac" dry type optional	
	Electric starting equipment	12 volt w/SAE flange mounted starter	
	Electric starting receptacle	Plug in type	
	Tach. drive	Electrical	
	Torsional crankshaft damper		
	Murphy vacuum shutoff panel		

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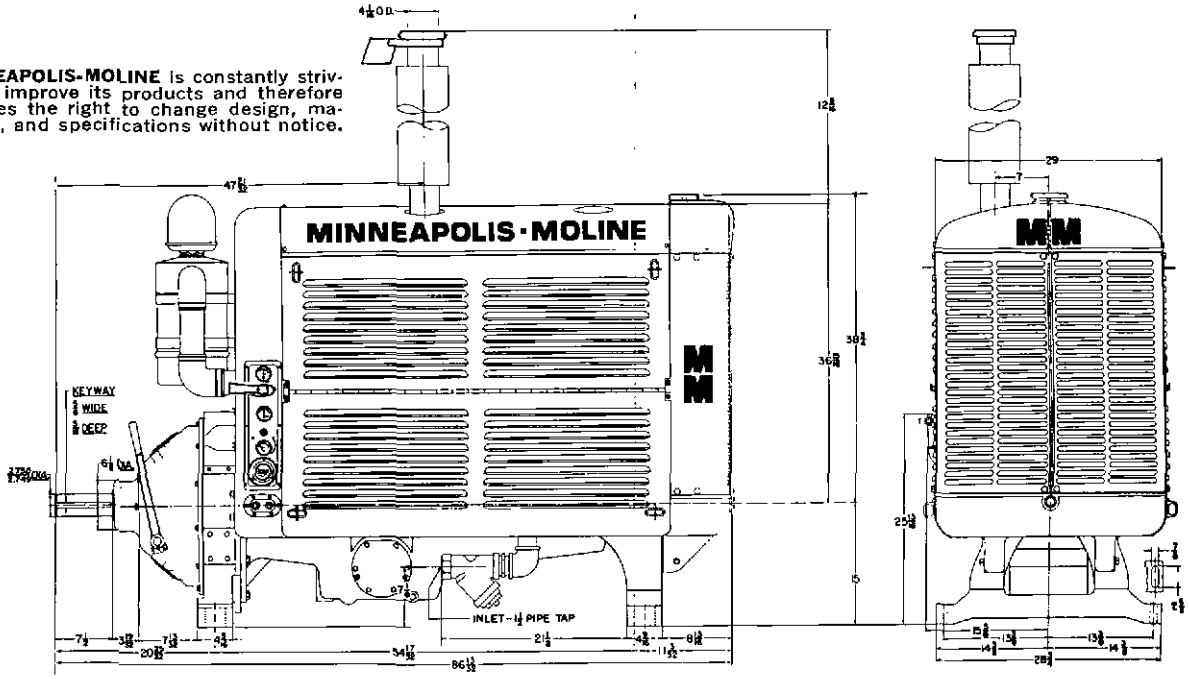

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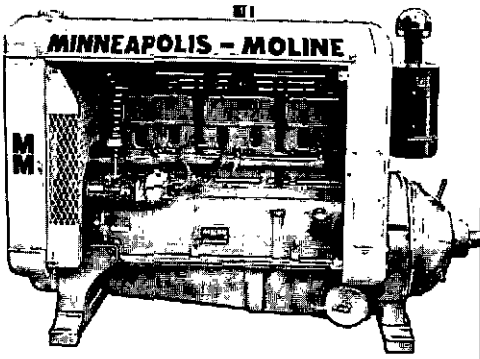
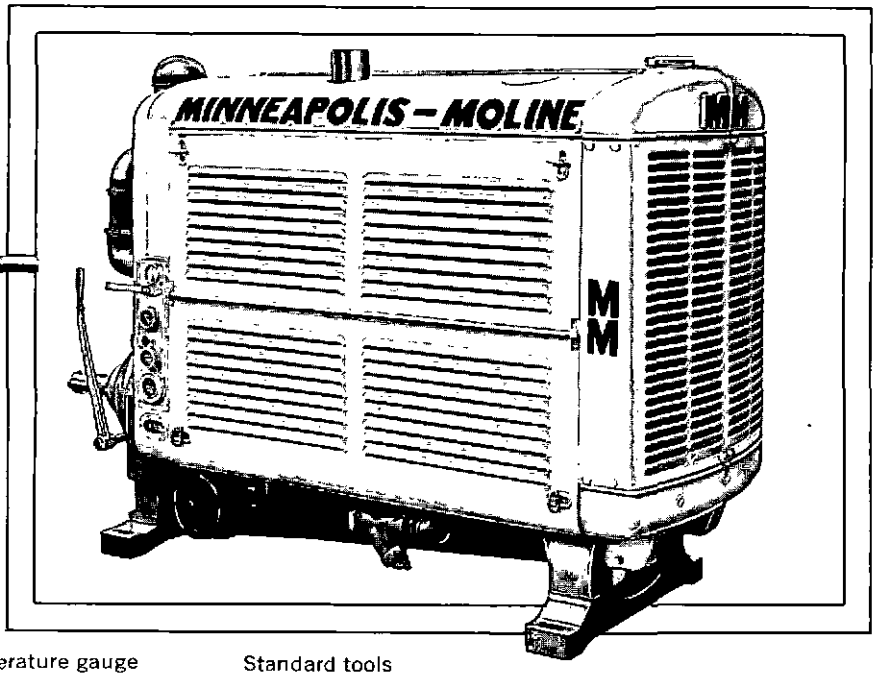
MINNEAPOLIS-MOLINE

BULLETIN NO. 1032 (1-67)

OIL FIELD POWER UNIT HD504A-6A





GENERAL DESCRIPTION

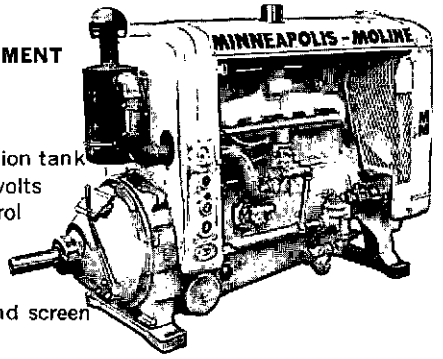
TYPE	6 CYL., VALVE IN HEAD
BORE	4⅝"
STROKE	5"
APPROXIMATE WEIGHT	2400 LBS.

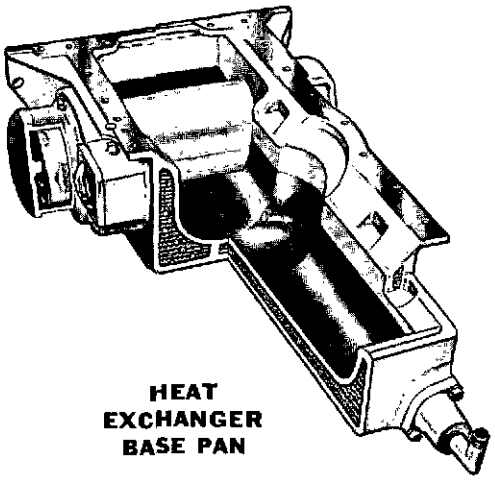
STANDARD EQUIPMENT

Sheet metal enclosures
Hinged hood
Folding side doors
Legs, front and rear
Radiator and fan assembly
Radiator pressure cap
Instrument panel and controls
S.A.E. No. 1 flywheel housing
Muffler
Power take-off, housing, clutch
Twin disc clutch
Manifolds and carburetor
Heavy-duty magneto
Built-in governor
Oil pump and water pump
Oil pressure gauge
Water temperature gauge
Sight oil gauge
Water thermostat, by-pass
Water temperature cutout
Oil pressure cutout
Oil filter, replaceable cartridges
Oil bath air cleaner (stack-type)
Vacuum crankcase ventilation
Flywheel, fan drive pulley
Flywheel ring gear
Exhaust valve seat inserts, Stellite
Exhaust valves (Stellite Faced)
Starter motor, 12-volt
Plug-in starting receptacle
Fan guard
Spark plugs and cables
Heat exchanger base pan
Aluminum pistons
Standard tools
Natural gas carburetor and regulator-ensign-or-impco

ADDITIONAL EQUIPMENT

Generator, 12-volt
Dry type air cleaner
Battery cables
Heat exchanger expansion tank
Distributor ignition, 12 volts
Automatic oil level control
Pusher-type fan
Hour meter
Electric tachometer
Natural gas regulator and screen
Low tension magneto ignition—F.M.

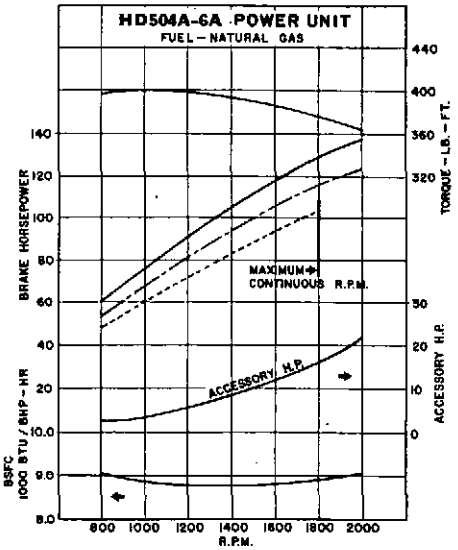




HEAT EXCHANGER BASE PAN

Water pump circulates engine water through base pan to maintain uniform engine and oil temperature. Results in quicker warm-up, less sludge, fewer oil changes, longer engine life.

PERFORMANCE



FOR STRIPPED ENGINES:

——— Maximum Output—SAE J606 (29.92 + 60°F.)
—·—·— Intermittent Rating
--------- Continuous Rating

NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

NOTE: Natural Gas performance run with fuel HHV=1000 BTU/FT.³: Fuel Consumption based on LHV=900 BTU/FT.³.

SPECIFICATIONS FOR HD504A-6A OIL FIELD POWER UNIT

GENERAL:
- Bore and stroke 4⅝x5
- Number of cylinders 6
- Piston displacement cu. in. 504
- Rotation facing flywheel ..... CCW
- **NG**
- Maximum horsepower at 1800 RPM 129
- Compression Ratio 8.8:1
- Compression Pressure—PSI 200

CRANKSHAFT:
- Shaft ..... Drop forged steel, heat treated and counter balanced
- Number of bearings 4
- Bearing type and material ..... Precision, Tri-metal
- Front ..... 2-29/32″x2-3/16″
- Intermediate ..... (Two) 2-29/32″x2-7/16″
- Rear ..... 2-29/32″x3½″

CYLINDERS:
- Cast ..... In pairs
- Material ..... Cast iron
- Cylinder block ..... Removable

CYLINDER HEADS:
- Cast ..... In pairs
- Material ..... Cast iron

CONNECTING RODS:
- Material ..... Drop forged steel
- Style ..... Forged I section
- Bearing size ..... 2-29/32″ dia. x 2-3/32″
- Bearing type and material ..... Precision, Tri-Metal

PISTONS:
- Material ..... Alum. Alloy
- Rings, number 4
  - compression ..... three 3/32″ wide
  - oil ..... one 3/16″ wide

PISTON PIN:
- Type ..... Full floating
- Bearing size ..... 1¼″ dia. x 2″
- Bushing material ..... Bronze, steel backed

CAMSHAFT:
- *Material ..... Cast Proferall metal*
- Number of bearings 4
- Drive ..... Helical gears

VALVE AND VALVE MECHANISM:
- Arrangement ..... In head
- Intake valves ..... 1-23/32″ alloy steel
- Exhaust valves ..... 1-19/32″ Stellite faced
- Exhaust valve seats ..... Stellite
- Tappet ..... Barrel type. Ported
- Tappet material ..... Chilled cast iron

IGNITION:
- Magneto ..... Heavy-duty, flange mtd.
- Spark plugs ..... 18 MM

OILING SYSTEM:
- Pump ..... Submerged gear located in sump
- Pump capacity ..... 12 GPM @ 1800 RPM
- Filter ..... Replaceable cartridge type, in base pan
- Pressure points ..... Rod, main and camshaft bearings, timing gears, valve mechanism and governor
- *Crankcase capacity ..... 6 gallons*
- Oil level gauge ..... Bayonet and sight glass
- Pressure gauge ..... On instrument panel

CRANKCASE VENTILATION:
- Breather ..... Oil wash
- Ventilator ..... Vacuum metering valve connected to intake manifold

FUEL SYSTEM:
- Carburetor ..... Nat. Gas 1¾″ Ensign Impco Carb. Optional

COOLING SYSTEM:
- Pump ... Centrifugal gear driven 95 GPM @ 1800 RPM
- Coolant by-pass ..... Thermostatically controlled
- Fan ..... 24″ dia.—6 blades on tapered roller bearings
- Fan and belt guard ..... Detachable steel mesh
- Fan Drive ..... Two V belts
- Capacity with standard equipment ..... 17.5 gal.
- Radiator core ..... Tubular, lead coated
- Tanks ..... Cast iron top and bottom
- Radiator grille ..... Heavy punched steel
- Coolant temperature ..... Thermostatically controlled pressure system

POWER TAKE-OFF:
- Clutch ..... 14″ twin disc
- Shaft ..... 2¾″ dia. w/⅝″x5/16″ key way
- Flywheel housing ..... SAE No. 1 flange
- Power take-off ..... SAE No. 1 (two inspection covers)
- Power take-off shaft bearings ..... (Two) Tapered roller
- Pilot bearing ..... Double row ball
- Lubrication ..... Pressure gun to pilot, clutch throwout and shaft bearings
- Shifter lever ..... Can be mounted on either side

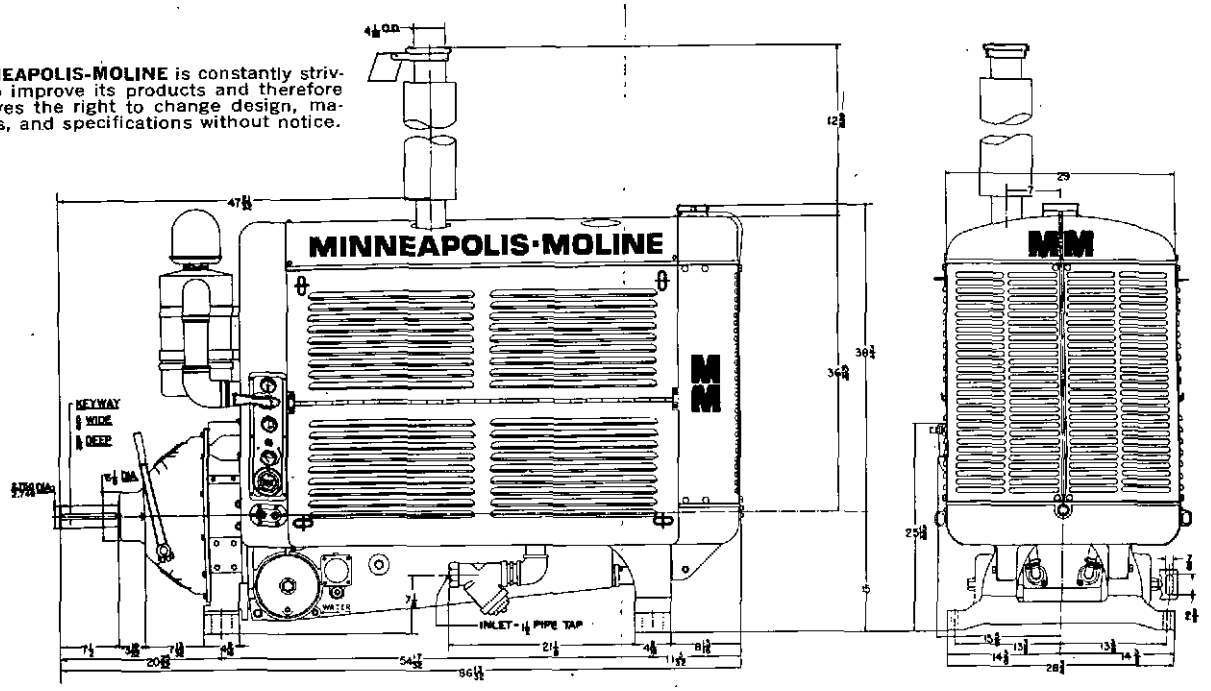
INSTRUMENT PANEL:
- *Panel ..... Enclosed, mounted on either side of unit*
- Instruments and controls—
  - Safety water temperature gauge, oil pressure gauge and safety cutout, vacuum gauge, ignition switch, starting switch, cannon type electric starting receptacle and hand throttle. Provision for ammeter and generator charging control.

ENCLOSURES:
- Hood ... Formed of heavy gauge steel, hinged at center
- Side Covers—
  - Heavy gauge steel, hinged at center and entirely removable. Top half may be folded down or bottom folded up and latched in place.
- Rear cover ..... Reinforced heavy gauge steel

SAFETY EQUIPMENT:
- Oil pressure ... Murphy safety switch, grounds magneto
- Coolant temperature ..... Murphy safety switch, grounds magneto

MISCELLANEOUS:
- Governor ..... Gear driven flyball
- Muffler ..... Low resistance
- Air cleaner ..... Rear mounted stack type oil bath standard. "Cyclopac" dry type optional
- Electric starting equipment ..... 12 volt w/SAE flange mounted starter
- Electric starting receptacle ..... Plug in type
- Tach. drive ..... Electrical
- *Torsional crankshaft damper*
- **Crankcase oil level automatic oil flow controller**
- Murphy vacuum shutoff panel

MINNEAPOLIS-MOLINE is constantly striving to improve its products and therefore reserves the right to change design, materials, and specifications without notice.



MINNEAPOLIS-MOLINE®

MM *Long Life Engines*

MINNEAPOLIS-MOLINE, INC., Hopkins, Minnesota
A Subsidiary of **WHITE MOTOR CORPORATION**

SOLD AND SERVICED BY:

Printed in U.S.A.

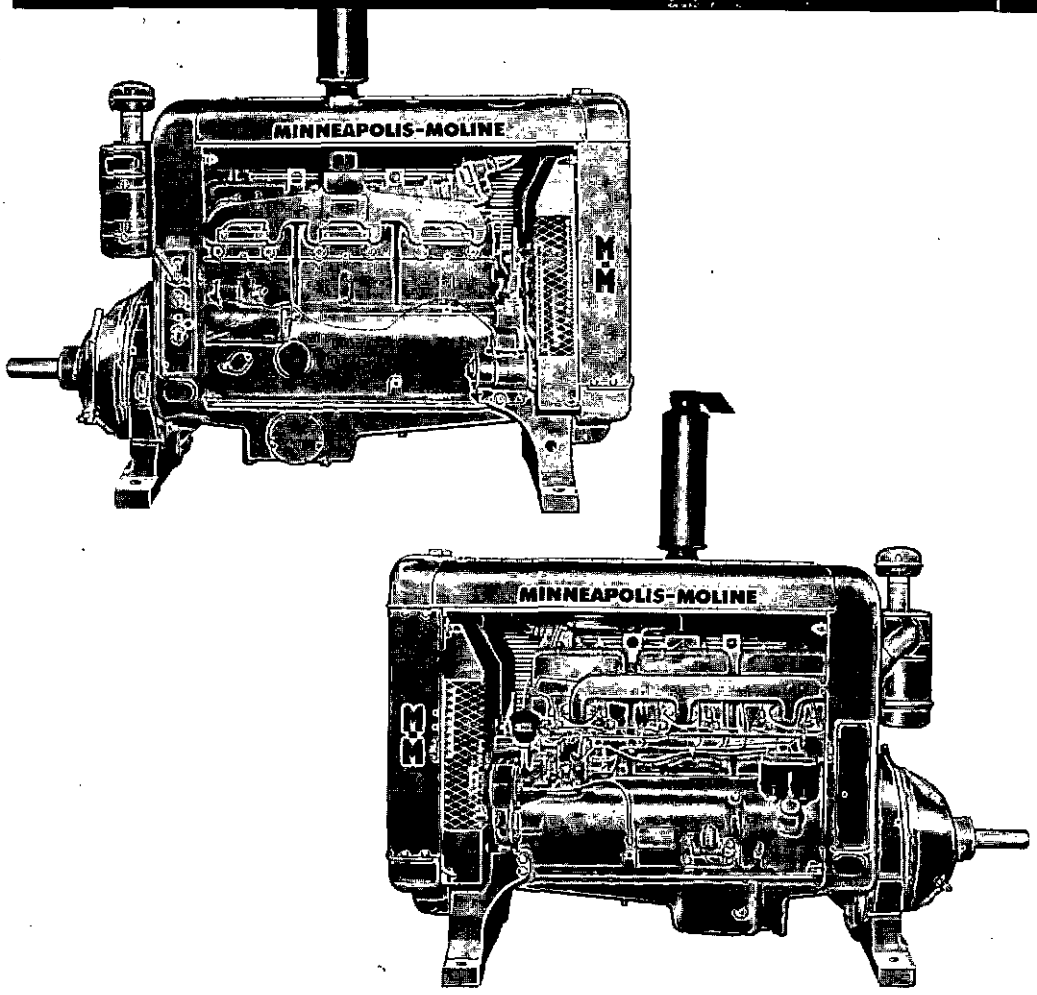
CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	HD504A-6A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Standard Equipment			
	4-5/8x5 6-cylinder Moline engine. Magneto or distributor. Manifolds. Spark plugs and cables. Carburetor. Flywheel and ring gear. Water pump. Torsional damper fan drive pulley. Oil pump. Muffler. Oil filter. Thermostat and by-pass. Oil bath air cleaner. Positive crankcase ventilation. Governor. Lifting eye.			
	Basic Power Units — Comp. Ratio			
& 661412	HD504A-6A BASIC POWER UNIT. Magneto - LP gas or natural gas.....7.8:1	1903.00	1815	.....
& 661422	HD504A-6A BASIC POWER UNIT. Distributor - LP gas or natural gas.....7.8:1	1859.00	1815	.....
& 661612	HD504A-6A BASIC POWER UNIT. Magneto - natural gas only.....8.8:1	1903.00	1815	.....
&. 661622	HD504A-6A BASIC POWER UNIT. Distributor - natural gas only.....8.8:1	1859.00	1815	.....
	+Fuel Note: For operation on natural gas containing less then 80% methane, order Basic Power Unit with 7.8:1 compression ratio. For operation on LP gas at 4,000 feet and above, order Basic Power Unit with 8.8:1 compression ratio. For operation on natural gas at 4,000 feet and above, order 10.1:1 compression ratio cylinder head option listed under Additional Equipment.			
	Note: Natural gas or LP gas power units require a regulator or vaporizer to complete. See Additional Equipment.			
	Note: Basic unit does not include instrument panel, flywheel housing, power take-off, legs, radiator, fan or inclosures. See Additional Equipment.			
	Additional Equipment - Factory Installed Only			
& 690276	SAE NO. 1 FLYWHEEL HOUSING.....Add	63.50	115	.....
& 690231	POWER UNIT LEGS. Front and rear. Requires flywheel housing.....Add	48.00	125	.....
& 690330	INSTRUMENT PANEL AND CONTROLS. Less gauges. Requires 690320, 690321 or 690322.....Add	25.00	4	.....
690320	STANDARD GAUGES. Oil and temperature.....Add	9.25	1	.....
690321	SAFETY CUT-OUTS. (Murphy). Includes oil and temperature gauges. For magneto ignition.....Add	23.00	2	.....
690322	SAFETY CUT-OUTS. (Murphy). Includes oil and temperature gauges. For distributor ignition.....Add	35.25	2	.....
690111	HOURMETER. 12-Volt.....Add	33.25	2	.....
690141	VACUUM GAUGE. With shut-off valve. (Mounts on intake manifold).....Add	11.00	1	.....
690348	VACUUM PANEL. (Murphy). Automatic high-low vacuum shut-off.....Add	42.00		.....
& 690327	MECHANICAL TACHOMETER DRIVE PARTS. Less tachometer head.....Add	22.50	15	.....
& 690245	NATURAL GAS REGULATOR. Includes screen and fittings.....Add	83.00	15	.....
690246	LP GAS VAPORIZER. Includes filter. (Ensign Model "NS"). Requires 690247 to install.....Add	93.50	25	.....
& 690247	BRACKETS, FITTINGS AND TUBING.....Add	28.00	10	.....
+ 690356	IMPCO NATURAL GAS REGULATOR. Includes screen. Requires 690355.....Add	41.00	18	.....
+ 690357	IMPCO LP GAS VAPORIZER-REGULATOR. Includes filter. Requires 690355.....Add	109.00		.....
+ 690355	IMPCO CARBURETOR. For NG or LP gas in place of Ensign.....Add	11.50	-	.....

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	HD504A-6A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Additional Equipment - Factory Installed Only (Continued)			
& 690232	POWER TAKE-OFF. Requires flywheel housing. Includes housing, clutch and shaft.....Add	294.00	240	.....
& 690259	POWER TAKE-OFF. Heavy duty. Requires flywheel housing. Includes housing, 14-inch double disc Twin Disc clutch and shaft.....Add	401.00	375	.....
& 690233	RADIATOR AND FAN. For standard manifolds. With pressure cap.....Add	263.00	275	.....
& 690243	RADIATOR AND FAN. For water-cooled manifolds. With pressure cap.....Add	325.00	294	.....
& 690278	PUSHER-TYPE FAN. In place of standard. Requires 690063 fan guard.....Add	6.50	-	.....
& 690063	FAN GUARD.....Add	26.00	10	.....
& 690234	INCLOSURES. Includes hood, support and side covers.....Add	99.00	190	.....
& 690004	ELECTRIC STARTING RECEPTACLE.....Add	14.50	1	.....
& 690238	GENERATOR. 12-Volt. Includes ammeter. Less battery cables.....Add	52.50	24	.....
+ 690354	STARTING MOTOR. 12-Volt.....Add	92.50	40	.....
690250	MAGNETO. Low tension. In place of standard magneto.....Add	98.50	-	.....
690038	MAGNETO. Bendix-Scintilla S6RN-401. In place of standard magneto.....Add	5.25	-	.....
690240	AIR CLEANER. Dry-type.....Add	4.25	-	.....
+ 690362	HEAT EXCHANGER BASE PAN. In place of standard. Includes 6-1/2x9-inch filter.....Add	153.00	100	.....
& 690099	AUTOMATIC OIL LEVEL CONTROL. For use with heat exchanger base pan.....Add	21.00	1	.....
+ 190419	CYLINDER HEAD. 10.1:1 compression ratio. In place of standard for natural gas operation above 4,000 feet.....Add	18.00	-	.....
& 690242	WATER COOLED MANIFOLDS. In place of standard.....Add	135.00	60	.....
	Additional Equipment - Not Factory Installed			
& 690277	SAE NO. 1 FLYWHEEL HOUSING.....	66.00	115	.....
& 690252	POWER UNIT LEGS. Front and rear. Requires flywheel housing.....	48.00	125	.....
690186	REMOTE CONTROL PANEL.....	63.50	15	.....
& 690012	SIGHT OIL GAUGE.....	8.00	2	.....
690097	ELECTRIC TACHOMETER. Magneto ignition.....	70.50	5	.....
690258	ELECTRIC TACHOMETER. Distributor ignition.....	70.50	5	.....
690256	NATURAL GAS REGULATOR. Includes screen and fittings.....	87.50	15	.....
690254	LP GAS VAPORIZER. (Ensign Model "NS"). Includes filter. Requires 690255 to install.....	93.50	25	.....
& 690255	BRACKETS, FITTINGS AND TUBING.....	27.00	10	.....
690109	LP GAS VAPORIZER. (Ensign Model "M"). Includes filter. For remote mounting..	100.00	27	.....
& 690059	POWER TAKE-OFF. Consists of housing, clutch and shaft. Requires SAE No. 1 flywheel housing.....	317.00	257	.....
690257	RADIATOR AND FAN. For standard manifolds. With pressure cap.....	316.00	315	.....
690253	INCLOSURES. Includes hood, support and side covers.....	105.00	190	.....
690275	BATTERY CABLES.....	5.75	2	.....
& 690315	HEAT EXCHANGER EXPANSION TANK.....	61.50	80	.....
	11A17296 *Starting crank. Available from parts.*			
	Battery: Recommend (two) 12-Volt, 11 plate, 72 ampere hour capacity.			

MINNEAPOLIS-MOLINE

Specifications Bulletin 1038 (11-66)

DHD504-6A
INDUSTRIAL POWER UNIT
(Diesel)



GENERAL DESCRIPTION

The Minneapolis-Moline DHD504-6A Power Unit is a 504 cubic inch engine capable of operating at 1800 RPM on continuous and intermittent duty. At 1800 RPM this unit produces 139 horsepower.

This is a remarkably efficient, sturdy engine built to take long periods of punishing service. Approximate weight — stripped, but with PTO, legs and instruments — 2400 lbs.

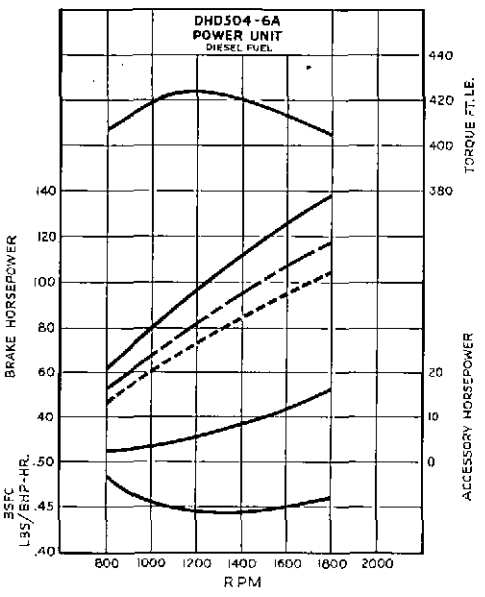
ECONOMICAL DESIGN — heavy crankcase with blocks and heads cast in pairs . . . a Minneapolis-Moline exclusive.

FULL PRESSURE LUBRICATION THROUGHOUT — full flow oil system is joined with a large capacity gear lube pump that delivers 12 GPM @ 1800 RPM.

COOL RUNNING ENGINE — controlled cooling system — large capacity water pump flows 95 gallons per minute at 1800 rpm. Includes one piece water outlet manifold, thermostats.

HEAVY CRANKSHAFT AND CONNECTING ROD DESIGN — with precision trimetal inserts, torsional vibration dampener.

PERFORMANCE



FOR STRIPPED ENGINES:

——————— Maximum Output— (29.92" Hg. & 60°F.)
——— — ——— Intermittent Rating
- - - - - - - - Continuous Rating

NOTE: To determine allowable continuous or intermittent duty horsepower, at any altitude or temperature conditions, use the values as determined above or 95% of available BHP, whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine ratings of completely equipped units, deduct accessory H.P. from stripped engine curves.

NOTE: Diesel performance run with #2 diesel fuel.

STANDARD EQUIPMENT

Water pump and oil pump
Fuel filter
Manifolds
Oil filter
Oil bath air cleaner
Fuel injection pump & governor
Nozzles and high pressure lines
Flywheel and ring gear
Fan drive pulley
Positive crankcase ventilation
Lifting eye. Muffler
Thermostat and bypass

ADDITIONAL EQUIPMENT

(factory installed only)

Instrument panel and controls.
SAE No. 1 flywheel housing.
Power unit legs, front and rear. Requires 690351 SAE housing.
PTO clutch and clutch shaft. Requires 690351 SAE housing.
Radiator and fan with pressure cap.
Enclosures.
Fan guard.
Starting motor. 12 volt.
Generator. 12 volt.
Air cleaner — dry type.
Heavy duty PTO assy.
Electric starting receptacle.
Hour meter
Safety switches. Combination, oil and temperature.
Pusher type fan. Requires fan guard 690063. Replaces std. fan.

(not factory installed)

Battery cables.
SAE No. 1 flywheel housing.
Heat exchanger expansion tank.
Sight oil gauge.

SPECIFICATIONS FOR DHD504-6A INDUSTRIAL POWER UNIT

GENERAL:
- Bore and stroke ..... 4⅝" x 5"
- Number of cylinders 6
- Piston displacement ..... 504 cu. in.
- RPM at piston speed of 1250 fpm 1500
- Rotation — facing flywheel end ..... C.C.W.
- Maximum Corrected HP @ 1800 RPM 139
- Compression ratio 14.3:1
- Compression pressure — PSI 440

CRANKSHAFT:
- Material ..... Drop-forged steel, heat treated
- Bearings, number 4
  - Size, front ..... 2 29/32" dia. x 2 1/16"
  - Intermediate ..... (two) 2 29/32" dia. x 2 1/16"
  - Rear ..... 2 29/32" dia. x 3 1/2"
  - Type ..... Precision tri-metal

CYLINDERS:
- Material ..... Special alloy cast iron
- Removable cylinder blocks ..... Cast in pairs
- Controlled combustion ..... Energy cells

CYLINDER HEADS:
- *Cast* ..... *In pairs*
- Material ..... Special alloy cast iron

CONNECTING RODS:
- Material ..... Drop-forged steel, heat treated
- Style ..... Forged I-section
- Bearings, size ..... 2 29/32" dia. x 2 1/16"
  - Type ..... Precision tri-metal

PISTONS:
- Material ..... Aluminum alloy, tin-plated
- Rings, number 4
  - Compression ..... Three — 3/32" wide
  - Oil ..... One — 3/16" wide

PINS:
- Type ..... Full floating
- Bearings, size ..... 1 1/2" dia. x 1 3/4"
- Bushing material ..... Bronze, steel-backed

CAMSHAFT:
- Material ..... Cast Proferall metal
- Number of bearings 4
- Drive ..... Helical gears

VALVES AND VALVE MECHANISM:
- Arrangement ..... In head
- Tappets, type ..... Barrel ported
  - Material ..... Chilled cast iron
- Intake valves ..... 1 19/32" Alloy steel
- Exhaust valves ..... 1 1/2" Alloy steel
- Valve seats (exhaust valve) ..... Stellite

OILING SYSTEM:
- Pump type ..... Submerged gear, located in sump
- Pump capacity ..... 12 gpm @ 1800 rpm
- Filter — Full flow ... Replaceable cartridge located in base pan
- Pressure points .... Rod, main and camshaft bearings, timing gears, valve mechanism and injection pump

- Base pan capacity ..... 3½ gallons
- Oil level gauges ..... Bayonet and sight
- Pressure gauges ..... On instrument panel

CRANKCASE VENTILATION:
- Type ..... Positive
- Breather ..... Oil-wash
- Ventilator ..... Snorkel tube under valve covers

FUEL SYSTEM:
- Injection pump ..... Roosamaster
- Injection nozzles ..... Pintle type
- Fuel filter ..... 2 parallel

COOLING SYSTEM:
- Pump type ..... Centrifugal
  - Drive ..... Gear
  - Capacity ..... 95 gpm @ 1800 rpm
- Coolant by-pass ..... Thermostatically controlled
- *Fan* ..... *24" dia.-6 blades on tapered roller bearings*
  - Fan drive ..... Two V-belt
- Capacity (regular) ..... 17.5 gallons
- Radiator, core ..... Tubular, lead-coated
  - Tanks ..... Cast iron top and bottom tanks
  - Grille ..... Heavy punched steel
- Water temperature ..... Thermostatically controlled
- *Temperature indicator* ..... *On instrument panel*

POWER TAKEOFF:
- Clutch ..... 14" twin disc
- Shaft ..... 2¾" dia. with ⅝" x 5/16" keyway
- Flywheel housing ..... SAE No. 1 flange
- Power take-off ..... SAE No. 1 (two inspection covers)
- Outboard bearing ..... 2 tapered roller bearings
- *Pilot bearing* ..... *Double row ball bearing*
- Lubrication ..... Pressure gun to pilot, clutch throwout and outboard bearings
- Shifter lever ..... Mounted on either side of unit

INSTRUMENT PANEL:
- Panel ..... Enclosed and mountable on either side of unit
- Instruments .... Water temperature gauge, oil pressure gauge, hand throttle. Provisions for starter button, ammeter, and starting cable receptacle.

ENCLOSURES:
- Hood ..... Formed of heavy gauge steel hinged at center and securely bolted in place.
- Side covers... Heavy gauge steel hinged at center and entirely *removable. Top half may be folded down or* bottom folded up and latched in position.
- Rear cover ..... Reinforced heavy gauge steel

SAFETY EQUIPMENT:
- Oil pressure ..... Stops engine if oil pressure drops below safe limit
- Water temperature ..... Stops engine if temperature exceeds *safe limit*

MISCELLANEOUS:
- Governor ..... Built in
- Muffler ..... Low resistance
- Air cleaner ..... Stack type oil bath std. — dry type optional
- Starting ring gear ..... Mounted on flywheel
- Electric starting equipment — neg. gr. ..... 12-volt heavy duty
- Electric starting receptacle ..... Plug-in Cannon type
- Tachometer drive ..... Upper end oil pump shaft

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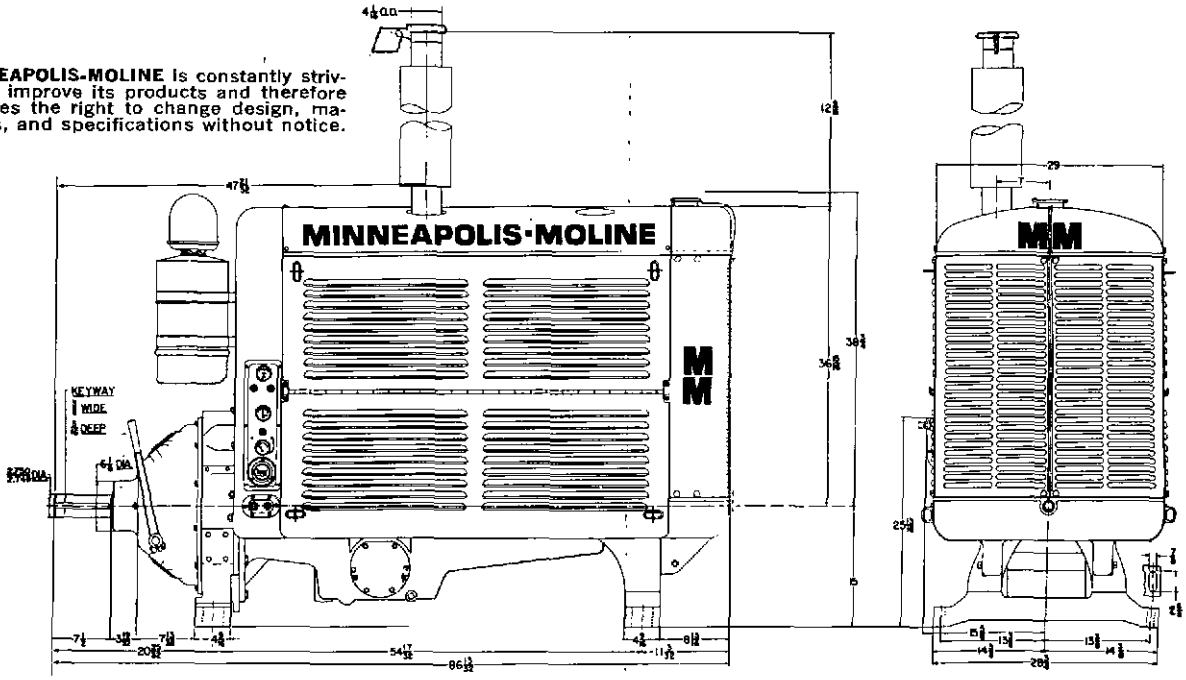


MINNEAPOLIS-MOLINE®

MM Long Life Engines

MINNEAPOLIS-MOLINE, INC., Hopkins, Minnesota
A Subsidiary of WHITE MOTOR CORPORATION

SOLD AND SERVICED BY:

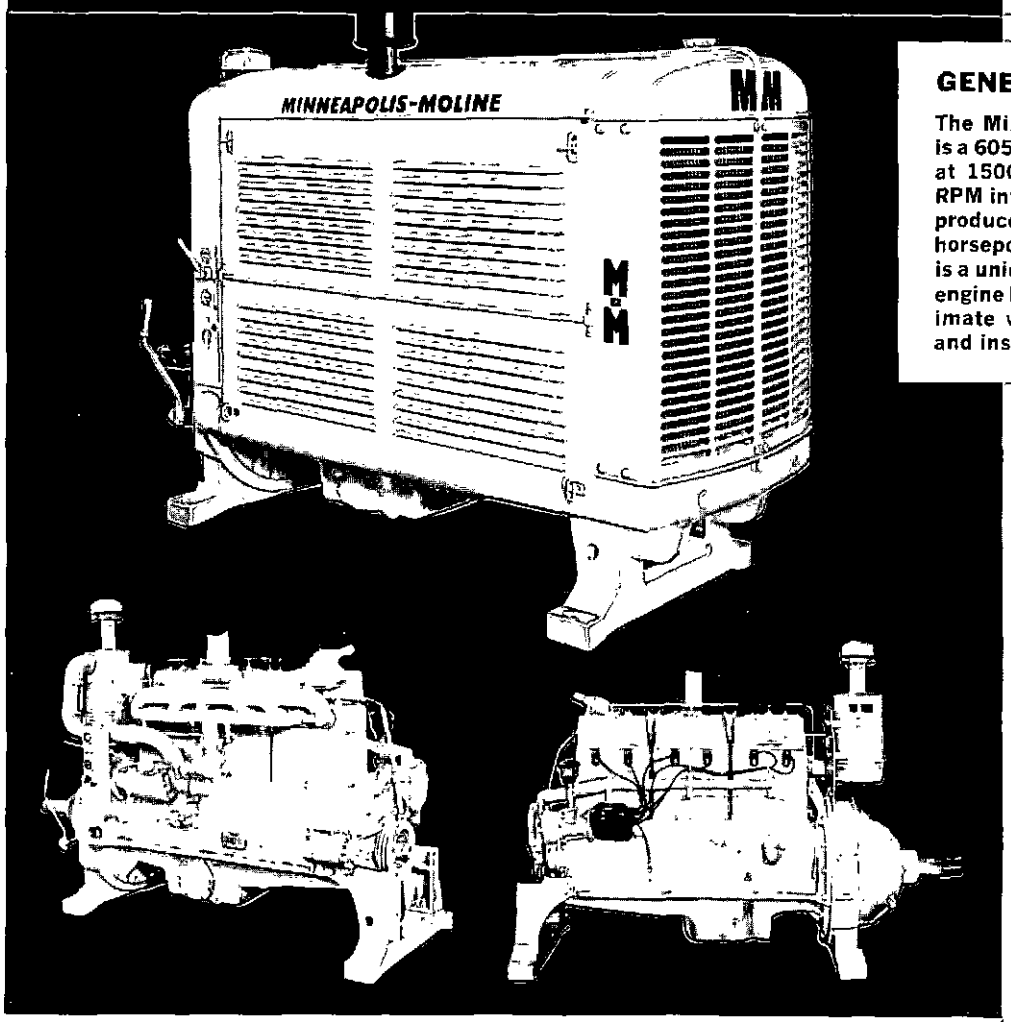
Printed in U.S.A.

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	DHD504-6A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Standard Equipment			
	4-5/8x5 6-cylinder Moline engine. Oil bath air cleaner. Manifolds. Governor. Fuel filter. Flywheel and ring gear. Fuel injection pump. Torsional damper fan drive pulley. Nozzles and high pressure lines. Muffler. Water pump. Thermostat and by-pass. Oil pump. Positive crankcase ventilation. Oil filter. Lifting eye.			
661711	DHD504-6A BASIC POWER UNIT. Diesel.....	2713.00	1865	.....
	Note: Basic unit does not include instrument panel, flywheel housing, power take-off, power unit legs, radiator and fan or inclosures. See Additional Equipment.			
	Additional Equipment - Factory Installed Only			
690351	SAE NO. 1 FLYWHEEL HOUSING.....Add	67.00	138	.....
690231	POWER UNIT LEGS. Front and rear. Requires flywheel housing.....Add	48.00	125	.....
690339	INSTRUMENT PANEL AND CONTROLS. Less gauges. Requires 690320 or 690340..Add	25.00	4	.....
690320	STANDARD GAUGES. Oil and temperature.....Add	9.25	1	.....
690340	SAFETY CUT-OUTS. Includes oil and temperature gauges.....Add	70.00	13	.....
690111	HOURMETER. 12-Volt.....Add	33.25	2	.....
690232	POWER TAKE-OFF. Requires 690351 flywheel housing. Includes housing, clutch and shaft.....Add	294.00	240	.....
690259	POWER TAKE-OFF. Heavy duty. Requires 690351 flywheel housing. Includes housing, 14-inch double disc Twin Disc clutch and shaft.....Add	401.00	375	.....
690233	RADIATOR AND FAN. With pressure cap.....Add	263.00	275	.....
690278	PUSHER-TYPE FAN. In place of standard. Requires 690063 fan guard.....Add	6.50	-	.....
690063	FAN GUARD.....Add	26.00	10	.....
690234	INCLOSURES. Includes hood, support and side covers.....Add	99.00	190	.....
690004	ELECTRIC STARTING RECEPTACLE.....Add	14.50	1	.....
690238	GENERATOR. 12-Volt. Includes ammeter. Less battery cables.....Add	52.50	24	.....
690341	STARTING MOTOR. 12-Volt.....Add	215.00	60	.....
690353	AIR CLEANER. Dry-type. In place of oil bath.....Add	7.50	-	.....
	Additional Equipment - Not Factory Installed			
690352	SAE NO. 1 FLYWHEEL HOUSING.....	69.50	138	.....
690252	POWER UNIT LEGS. Front and rear. Requires flywheel housing.....	48.00	125	.....
690012	SIGHT OIL GAUGE.....	8.00	2	.....
690059	POWER TAKE-OFF. Consists of housing, clutch and shaft. Requires SAE No. 1 flywheel housing.....	317.00	257	.....
690257	RADIATOR AND FAN. With pressure cap.....	316.00	315	.....
690253	INCLOSURES. Includes hood, support and side covers.....	105.00	190	.....
690275	BATTERY CABLES.....	5.75	2	.....
690315	HEAT EXCHANGER EXPANSION TANK.....	61.50	80	.....
	Battery: Recommend (three) 12-Volt, 11 plate, 72 ampere hour capacity.			

MINNEAPOLIS-MOLINE

Specifications Bulletin 1028 (6-67)

605B-6A
INDUSTRIAL POWER UNIT
NATURAL GAS — LPG



GENERAL DESCRIPTION

The Minneapolis-Moline 605B-6A Power Unit is a 605 cubic inch engine capable of operating at 1500 RPM on continuous duty and 1600 RPM intermittent duty. At 1500 RPM, this unit produces 152 horsepower with LP gas and 145 horsepower with natural gas. The 605B-6A is a uniquely dependable, long life, heavy duty engine built for 24-hour-a-day service. Approximate weight—stripped, but with PTO, legs and instruments . . . 2550 lbs.

Economical design—heavy crankcase with blocks and heads cast in pairs . . . a Minneapolis-Moline exclusive.

Full pressure lubrication throughout—full flow oil system is joined with a large capacity gear lube pump that delivers 10.5 GPM @ 1600 RPM.

Cool running engine—large capacity water pump flows 80 GPM at 1600 RPM. Cooling system includes one-piece water outlet manifold, dual thermostats.

Heavy crankshaft and connecting rod design—with precision trimetal inserts, torsional vibration damper.

FUEL NOTE: For operation on natural gas containing less than 80% methane, order Basic Power Unit with 9.1:1 compression ratio.

For operation on LP gas not conforming to HD5 specifications, order 8.2:1 compression ratio cylinder head option listed under Additional Equipment.

STANDARD EQUIPMENT

Water pump and oil pump
Manifolds and carburetor (NG & LP)
Oil filter and governor
Oil bath air cleaner
Magneto spark plugs and cables
Distributor spark plugs and cables
Flywheel and ring gear
Torsional damper fan drive pulley
Positive crankcase ventilation
Lifting eye. Muffler
Thermostat and bypass

ADDITIONAL EQUIPMENT

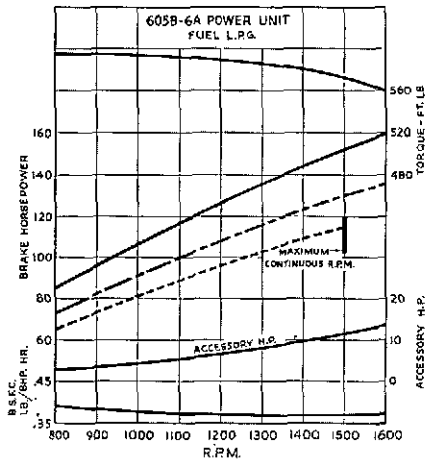
(factory installed only)

Instrument panel and controls.
SAE No. 1 flywheel housing.
Power unit legs, front and rear. Requires SAE housing.
PTO clutch and clutch shaft. Requires SAE housing.
Radiator and fan with pressure cap. Std. manifolds.
Enclosures.
Hour Meter—12V.
Mech. tach. drive parts
Fan guard.
Cylinder Head—8.2:1 Ratio
Starting motor. 12 volt.
Generator. 12 volt.
Electric starting receptacle.
Heat exchanger base pan. Includes dual 6½" x 9" filter.
Dry type air cleaner (in place of standard oil bath).
Automatic oil level control.
Safety switches. Murphy, oil and temperature.
Water cooled manifolds.
Radiator & fan w/press. cap for W-C Manifold.
Std. Oil & Temp. Gauges
Murphy Hi-Low Vacuum Shut-Off Panel
Pusher type fan. Requires fan guard. Replaces std. fan.
Natural gas regulator and filter with fittings. Ensign.
LP gas vaporizer (Ensign Model NS) requires brkts. to install.
Brackets, fittings, and tubing.
Bendix (S6RN-401) magneto in place of std.
Low tension magneto in place of std. magneto.
Vacuum Gauge.

(Not factory installed)

Elec. Tach.
Battery cables.
SAE No. 1 flywheel housing.
Heat exchanger expansion tank.
LP gas vaporizer (Ensign Model NS). Requires brkts. to install.
Brackets, fittings and tubing.
Legs front & rear.
Enclosures.
Sight oil gauge.
Nat. gas reg. & filter.

PERFORMANCE



FOR STRIPPED ENGINES:

——— Maximum Output—(29.92"Hg. & 60°F.)
— — — — Intermittent Rating
- - - - - - - - Continuous Rating

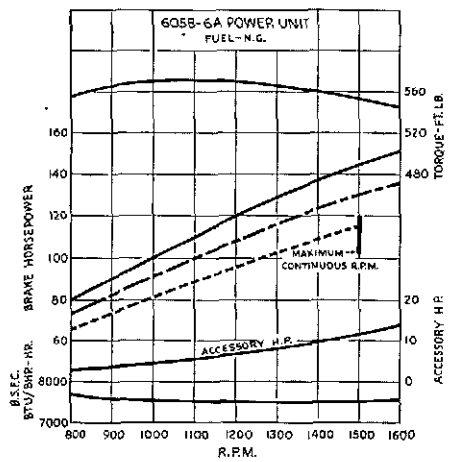
NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

NOTE: Natural Gas performance run with fuel HHV=1000 BTU/FT.^{3}; Fuel Consumption based on LHV=900 BTU/FT.^{3}.

LPG performance run with HD5 or equivalent quality.



605B-6A POWER UNIT

SPECIFICATIONS

GENERAL:

	NG	LPG
Bore and stroke	4⅛x6	
Number of cylinders	6	
Piston displacement cu. in.	605	
Rotation facing flywheel	CCW	
*Maximum horsepower at 1600 RPM	152	160
Compression Ratio	11.1:1	9.1:1
Compression Pressure—PSI	200	175

CRANKSHAFT: Shaft—Drop forged steel, heat treated and counter balanced
Number of bearings—4
Bearing type and material—Precision, Tri-metal
Front—2-29/32"x2-3/16"
Intermediate—(Two) 2-29/32"x2-7/16"
Rear—2-29/32"x3½"

CYLINDERS: Cast—In pairs
Material—Special Alloy Cast iron
Cylinder block—Removable

CYLINDER HEADS: Cast—In pairs
Material—Special Alloy Cast Iron

CONNECTING RODS: Material—Drop forged steel
Style—Forged I section
Bearing size—2¾" dia. x 2-3/32"
Bearing type and material—Precision, Tri-Metal

PISTONS: Material—Alum. Alloy
Rings, number—4
compression—three 3/32" wide
oil—one 3/16" wide

PISTON PIN: Type—Full floating
Bearing size—1¼" dia. x 2"
Bushing material—Bronze, steel backed

CAMSHAFT: Material—Cast Proferall metal
Number of bearings—4
Drive—Helical gears

VALVE AND VALVE MECHANISM: Arrangement—In head
Intake valves—1-23/32" alloy steel
Exhaust valves—1-19/32" Stellite faced
Exhaust valve seats—Stellite
Tappet—Barrel type. Ported
Tappet material—Chilled cast iron
Valve seals—On intake valves

IGNITION: Magneto—Heavy-duty, flange mtd.
Spark plugs—18 MM

OILING SYSTEM: Pump—Submerged gear located in sump
Pump capacity—10.5 GPM @ 1600 RPM
Filter—Replaceable cartridge type, in base pan
Pressure points—Rod, main and camshaft bearings, timing gears, valve mechanism and governor
Crankcase capacity—6 gallons
Oil level gauge—Bayonet and sight glass
Pressure gauge—On instrument panel

CRANKCASE VENTILATION: Breather—Oil wash
Ventilator—Vacuum metering valve connected to intake manifold

FUEL SYSTEM: Carburetor—LPG or Nat. Gas 1¾" Ensign

COOLING SYSTEM: Pump—Centrifugal gear driven 80 GPM @ 1600 RPM
Coolant by-pass—Thermostatically controlled
Fan—24" dia.—6 blades on tapered roller bearings
Fan and belt guard—Detachable steel mesh
Fan Drive—Two V belts
Capacity with standard equipment—17.5 gal.
Radiator core—Tubular, lead coated
Tanks—Cast iron top and bottom
Radiator grille—Heavy punched steel
Coolant temperature—Thermostatically controlled pressure system

POWER TAKE-OFF: Clutch—14" twin disc
Shaft—2¾" dia. w/⅜"x5/16" key way
Flywheel housing—SAE No. 1 flange
Power take-off—SAE No. 1 (two inspection covers)
Power take-off shaft bearings—(Two) Tapered roller
Pilot bearing—Double row ball
Lubrication—Pressure gun to pilot, clutch throwout and shaft bearings
Shifter lever—Can be mounted on either side

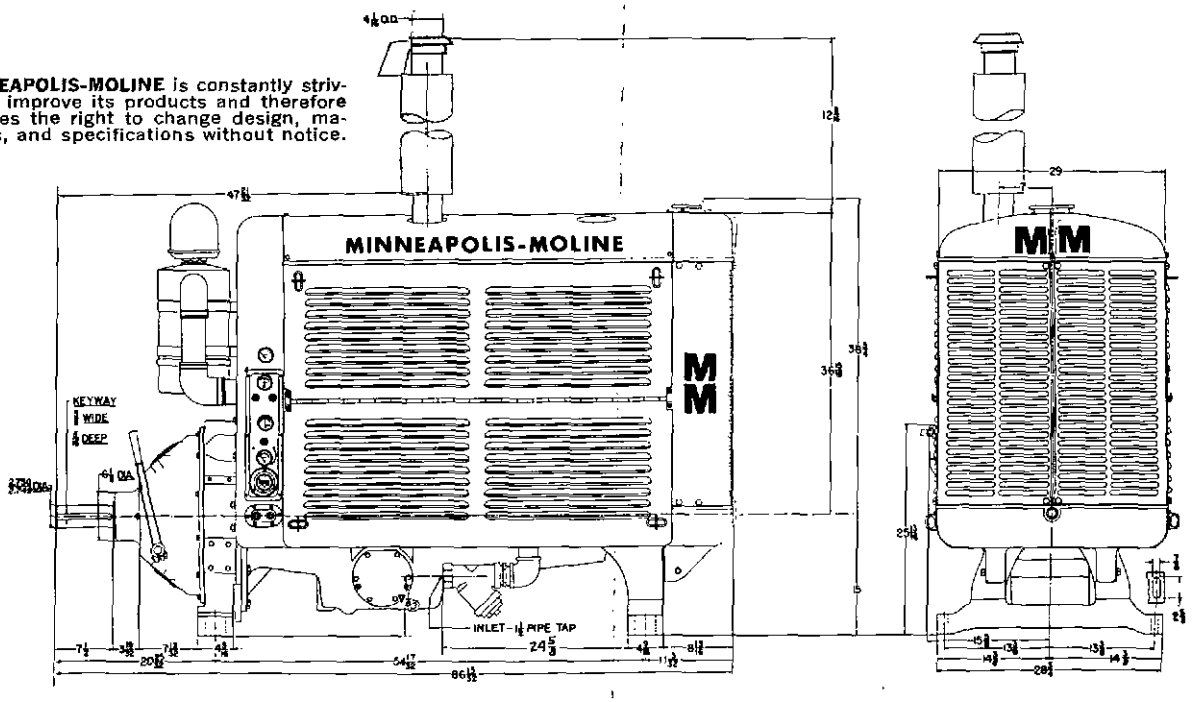
INSTRUMENT PANEL: Panel—Enclosed, mounted on either side of unit
Instruments and controls—
Water temperature gauge, oil pressure gauge, hand throttle and ignition switch. Provision for ammeter, starter button and starting receptacle.

ENCLOSURES: Hood—Formed of heavy gauge steel, hinged at center
Side Covers—
Heavy gauge steel, hinged at center and entirely removable. Top half may be folded down or bottom folded up and latched in place.
Rear cover—Reinforced heavy gauge steel

SAFETY EQUIPMENT: Oil pressure switch—grounds magneto if oil pressure drops below safe limit. Water temperature switch—grounds magneto if temperature exceeds safe limit.

MISCELLANEOUS:
Governor—Gear driven flyball
Muffler—Low resistance
Air cleaner—Rear mounted stack type oil bath standard. "Cyclopac" dry type optional
Electric starting equipment—12 volt w/SAE flange mounted starter
Electric starting receptacle—Plug in type
Tach. drive—Mechanical
Torsional crankshaft damper

MINNEAPOLIS-MOLINE is constantly striving to improve its products and therefore reserves the right to change design, materials, and specifications without notice.



MINNEAPOLIS-MOLINE
MM Long Life Engines
MINNEAPOLIS MOLINE, INC., Hopkins, Minnesota
A Subsidiary of WHITE MOTOR CORPORATION

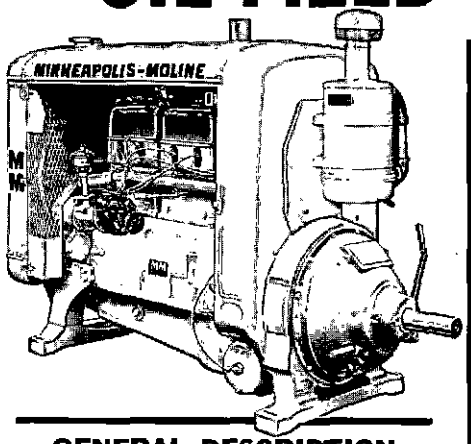
SOLD AND SERVICED BY:

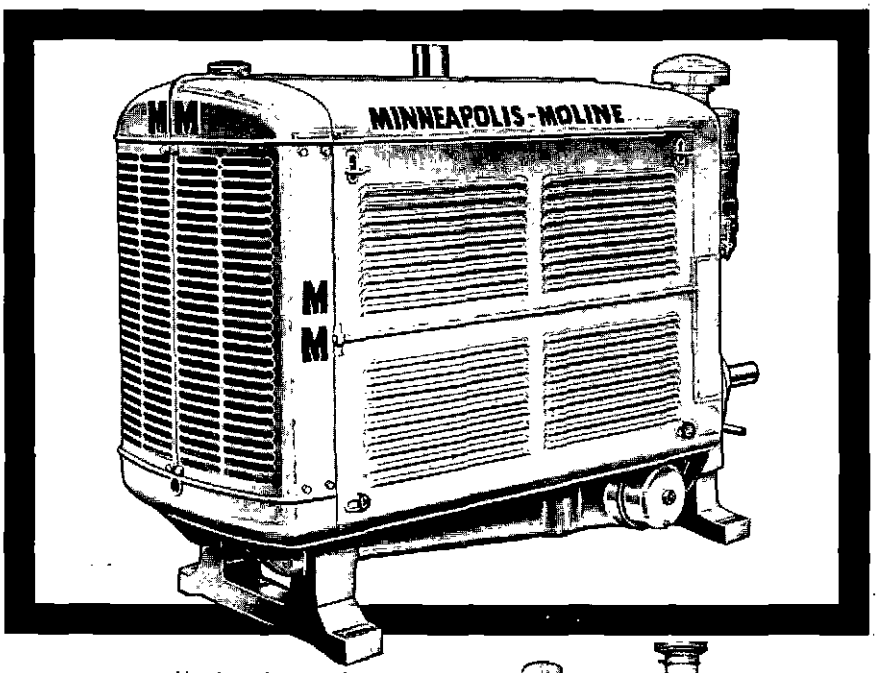
5-64 Printed in U.S.A.

MINNEAPOLIS-MOLINE®

BULLETIN NO. 1029 (6-66)

OIL FIELD POWER UNIT 605B-6A





GENERAL DESCRIPTION

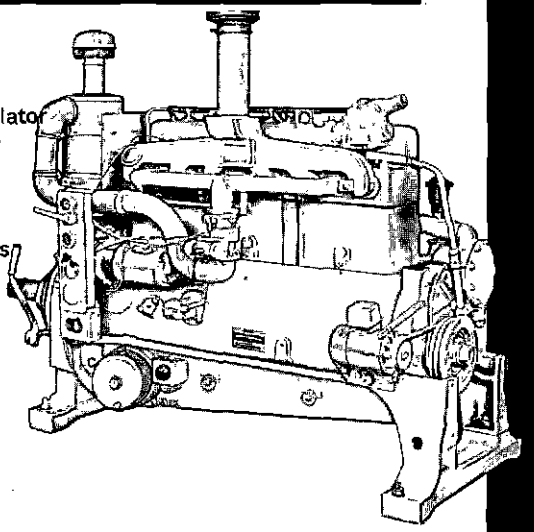
TYPE	6 CYLINDER VALVE-IN-HEAD
BORE	4⅝ INCHES
STROKE	6 INCHES
PISTON DISPLACEMENT	605 CU. IN.
R.P.M. AT 1,300 FT. P.S.	1,300
APPROXIMATE WEIGHT	3200 LBS.

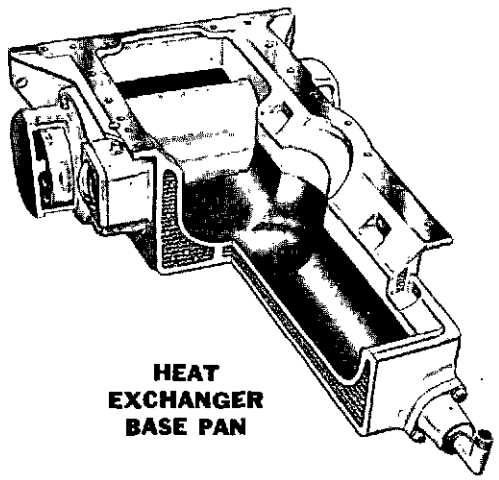
STANDARD EQUIPMENT

Sheet metal enclosures
Hinged hood
Folding side doors
Legs, front and rear
Radiator and fan with pressure cap
Instrument panel and controls
S.A.E. No. 1 flywheel housing
Muffler
Power take-off, housing, clutch
Twin disc clutch
Manifolds and carburetor
Heavy-duty magneto
Built-in governor
Oil pump and water pump
Oil pressure gauge
Water temperature gauge
Vacuum gauge
Sight oil gauge
Water thermostat, by-pass
Water temperature cutout
Oil pressure cutout
Oil filter, replaceable cartridges
Oil bath air cleaner (stack type)
Vacuum crankcase ventilation
Flywheel, fan drive pulley
Flywheel ring gear
Exhaust valve seat inserts, Stellite
Starter motor, 12-volt
Plug-in starting receptacle
Fan guard
Spark plugs and cables
Heat exchanger base pan
Aluminum pistons
Standard tools
Natural gas carb and regulator

ADDITIONAL EQUIPMENT

Generator, 12-volt
Automatic oil level control
Pusher-type fan
Distributor ignition, 12 volts
Low tension magneto ignition—F.M.
Hour meter
Electric tachometer
Water-cooled manifolds
Battery cables
Mechanical Tach. drive parts
Heavy duty PTO ass'y
Murphy hi-lo vacuum shutoff panel

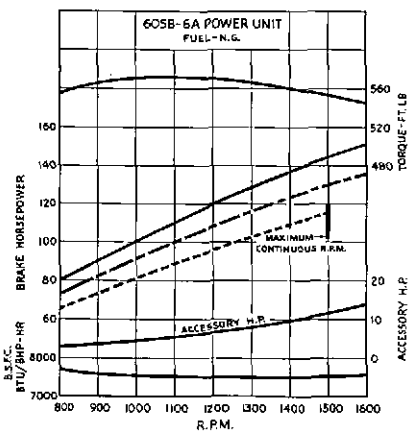




HEAT EXCHANGER BASE PAN

Water pump circulates engine water through base pan to maintain uniform engine and oil temperature. Results in quicker warm-up, less sludge, fewer oil changes, longer engine life.

PERFORMANCE



FOR STRIPPED ENGINES:

——— Maximum Output—(29.92" Hg. & 60°F.)
– – – – – Intermittent Rating
---------- Continuous Rating

NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

NOTE: Natural Gas performance run with fuel HHV=1000 BTU/FT.³: Fuel Consumption based on LHV=900 BTU/FT.³.

605B-6A POWER UNIT

SPECIFICATIONS

GENERAL:
Bore and stroke 4⅛x6
Number of cylinders 6
Piston displacement cu. in. 605
Rotation facing flywheel ..... CCW
NG
Maximum horsepower at 1600 RPM 125
Compression Ratio 11.1:1
Compression Pressure—PSI 200

CRANKSHAFT:
Shaft ..... Drop forged steel, heat treated and counter balanced
Number of bearings 4
Bearing type and material ..... *Precision, Tri-metal*
Front ..... 2-29/32"x2-3/16"
Intermediate ..... (Two) 2-29/32"x2-7/16"
Rear ..... 2-29/32"x3½"

CYLINDERS:
Cast ..... In pairs
Material ..... Special Alloy Cast iron
Cylinder block ..... *Removable*

CYLINDER HEADS:
Cast ..... In pairs
Material ..... Special Alloy Cast iron

CONNECTING RODS:
Material ..... Drop forged steel
Style ..... Forged I section
Bearing size ..... 2¾" dia. x 2-3/32"
Bearing type and material ..... Precision, Tri-Metal

PISTONS:
Material ..... Alum. Alloy
Rings, number 4
compression ..... three 3/32" wide
oil ..... one 3/16" wide

PISTON PIN:
Type ..... *Full floating*
Bearing size ..... 1¼" dia. x 2"
Bushing material ..... Bronze, steel backed

CAMSHAFT:
Material ..... Cast Proferall metal
Number of bearings 4
Drive ..... Helical gears

VALVE AND VALVE MECHANISM:
Arrangement ..... In head
Intake valves ..... 1-23/32" alloy steel
Exhaust valves ..... 1-19/32" Stellite faced
Exhaust valve seats ..... Stellite
Tappet ..... Barrel type. Ported
Tappet material ..... Chilled cast iron
Valve seals ..... On intake valves

IGNITION:
Magneto ..... Heavy-duty, flange mtd.
Spark plugs ..... 18 MM

OILING SYSTEM:
Pump ..... Submerged gear located in sump
Pump capacity ..... 10.5 GPM @ 1600 RPM
Filter ..... Replaceable cartridge type, in base pan
Pressure points ..... Rod, main and camshaft bearings, timing gears, valve mechanism and governor
Crankcase capacity ..... 6 gallons
Oil level gauge ..... Bayonet and sight glass
Pressure gauge ..... On instrument panel

CRANKCASE VENTILATION:
Breather ..... Oil wash
Ventilator ..... Vacuum metering valve connected to intake manifold

FUEL SYSTEM: Carburetor ..... Nat. Gas 1¾": Ensign

COOLING SYSTEM:
Pump ..... Centrifugal gear driven 80 GPM @ 1600 RPM
Coolant by-pass ..... Thermostatically controlled
Fan ..... *24" dia.—6 blades on tapered roller bearings*
Fan and belt guard ..... Detachable steel mesh
Fan Drive ..... Two V belts
Capacity with standard equipment ..... 17.5 gal.
Radiator core ..... Tubular, lead coated
Tanks ..... Cast iron top and bottom
Radiator grille ..... Heavy punched steel
Coolant temperature ..... Thermostatically controlled pressure system

POWER TAKE-OFF:
Clutch ..... 14" twin disc
Shaft ..... 2¾" dia. w/⅝"x5/16" key way
Flywheel housing ..... SAE No. 1 flange
Power take-off ..... *SAE No. 1 (two inspection covers)*
Power take-off shaft bearings ..... (Two) Tapered roller
Pilot bearing ..... Double row ball
Lubrication ..... Pressure gun to pilot, clutch throwout and shaft bearings
Shifter lever ..... Can be mounted on either side

INSTRUMENT PANEL:
Panel ..... Enclosed, mounted on either side of unit
Instruments and controls—
Water temperature gauge, oil pressure gauge, hand *throttle and ignition switch. Provision for ammeter,* starter button and starting receptacle.

ENCLOSURES:
Hood ..... *Formed of heavy gauge steel, hinged at center*
Side Covers—
Heavy gauge steel, hinged at center and entirely removable. Top half may be folded down or bottom folded up and latched in place.
Rear cover ..... Reinforced heavy gauge steel

SAFETY EQUIPMENT: Oil pressure switch—grounds magneto if oil pressure drops below safe limit. Water temperature switch—grounds magneto if temperature exceeds safe limit.

MISCELLANEOUS:
Governor ..... Gear driven flyball
Muffler ..... Low resistance
Air cleaner ..... Rear mounted stack type oil bath standard. "Cyclopac" dry type optional
Electric starting equipment ..... *12 volt w/SAE flange* mounted starter
Electric starting receptacle ..... Plug in type
Tach. drive ..... Mechanical
Torsional crankshaft damper

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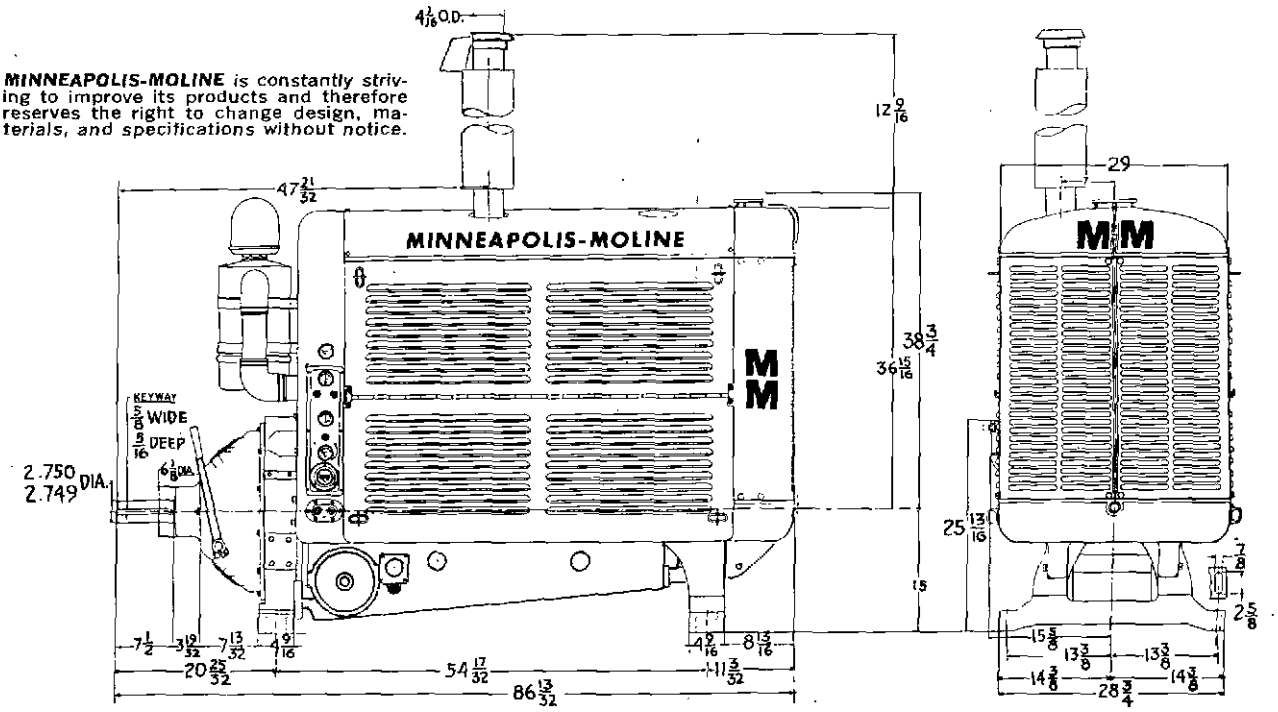

MINNEAPOLIS-MOLINE

MM *Long Life Engines*

MINNEAPOLIS-MOLINE, INC., Hopkins, Minnesota
A Subsidiary of WHITE MOTOR CORPORATION

SOLD AND SERVICED BY:

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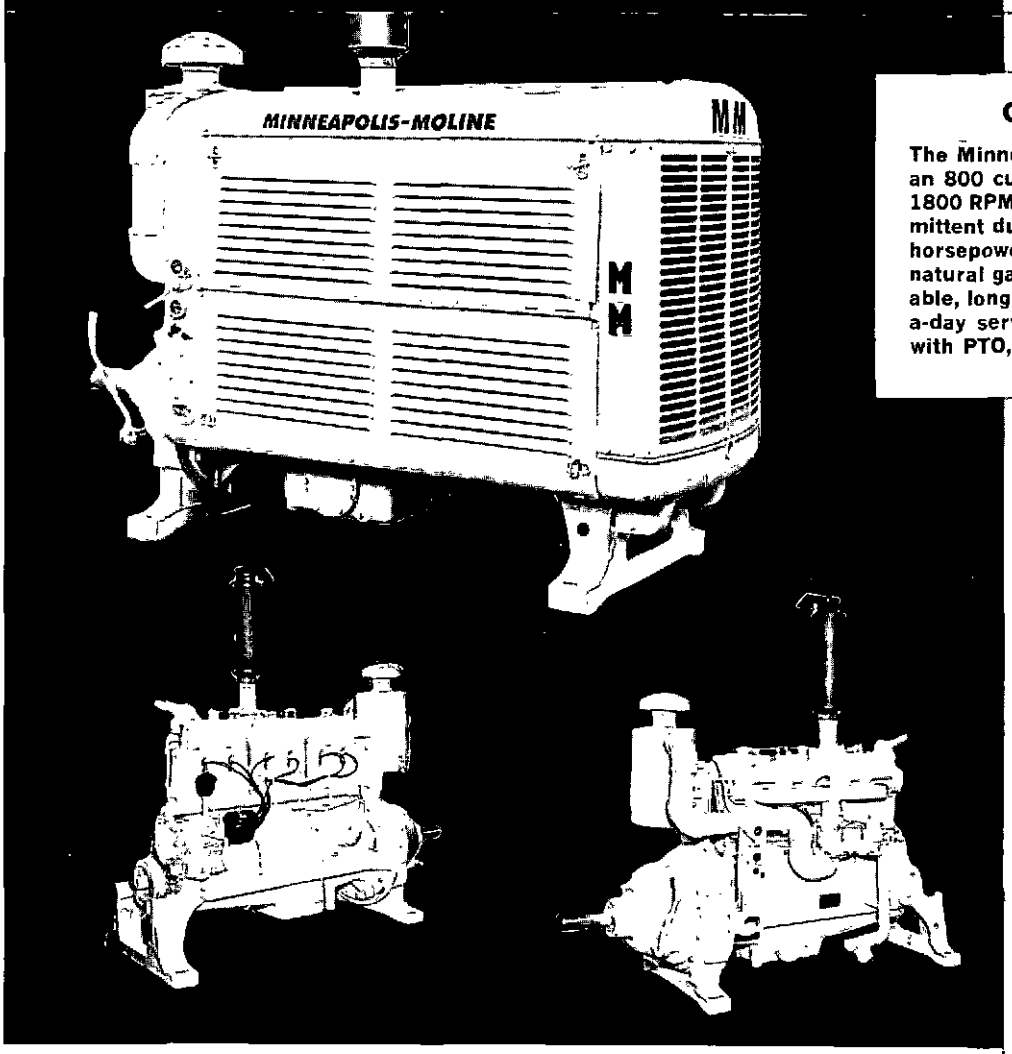
CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	605B-6A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Standard Equipment			
	4-5/8x6 6-cylinder Moline engine. Magneto or distributor. Manifolds. Spark plugs and cables. Carburetor. Flywheel and ring gear. Water pump. Torsional damper fan drive pulley. Oil pump. Muffler. Oil filter. Thermostat and by-pass. Oil bath air cleaner. Positive crankcase ventilation. Governor. Lifting eye.			
	Basic Power Units — Comp. Ratio			
& 671412	605B-6A BASIC POWER UNIT. Magneto - LP gas or natural gas.....9.1:1	2309.00	2065	.....
& 671432	605B-6A BASIC POWER UNIT. Distributor - LP gas or natural gas.....9.1:1	2265.00	2065	.....
& 671611	605B-6A BASIC POWER UNIT. Magneto - natural gas only.....10.6:1	2309.00	2065	.....
& 671631	605B-6A BASIC POWER UNIT. Distributor - natural gas.....10.6:1	2265.00	2065	.....
	Fuel note: For operation on natural gas containing less than 80% methane, order Basic Power Unit with 9.1:1 compression ratio. For operation on LP gas not conforming to HD5 specifications, order 8.2:1 compression ratio cylinder head option listed under Additional Equipment.			
	Note: Natural gas or LP gas power units require a regulator or vaporizer to complete. See Additional Equipment.			
	Note: Basic unit does not include instrument panel, flywheel housing, power take-off, legs, radiator, fan or inclosures. See Additional Equipment.			
	Additional Equipment - Factory Installed Only			
& 690276	SAE NO. 1 FLYWHEEL HOUSING.....Add	63.50	115	.....
& 690231	POWER UNIT LEGS. Front and rear. Requires 690276 flywheel housing.....Add	48.00	125	.....
& 690319	INSTRUMENT PANEL AND CONTROL. Less gauges. Requires 690320, 690321 or 690322.....Add	25.00	4	.....
690320	STANDARD GAUGES. Oil and temperature.....Add	9.25	1	.....
690321	SAFETY CUT-OUTS. (Murphy). Includes oil and temperature gauges. For magneto ignition.....Add	23.00	2	.....
690322	SAFETY CUT-OUTS. (Murphy). Includes oil and temperature gauges. For distributor ignition.....Add	35.25	2	.....
690111	HOURMETER. 12-Volt.....Add	33.25	2	.....
690141	VACUUM GAUGE. With shut-off valve. (Mounts on intake manifold.).....Add	11.00	1	.....
690348	VACUUM PANEL. (Murphy). Automatic high-low vacuum shut-off.....Add	42.00		.....
& 690327	MECHANICAL TACHOMETER DRIVE PARTS. Less tachometer head.....Add	22.50	15	.....
& 690346	NATURAL GAS REGULATOR. Includes screen and fittings.....Add	83.00	15	.....
690246	LP GAS VAPORIZER. (Ensign Model "NS"). Includes filter. Requires 690347 to install.....Add	93.50	25	.....
& 690347	BRACKETS, FITTINGS AND TUBING.....Add	28.00	10	.....
& 690232	POWER TAKE-OFF. Requires 690276 flywheel housing. Includes housing, clutch and shaft.....Add	294.00	240	.....
& 690259	POWER TAKE-OFF. Heavy duty. Requires 690276 flywheel housing. Includes housing, 14-inch double disc Twin Disc clutch and shaft.....Add	401.00	375	.....
& 690233	RADIATOR AND FAN. For standard manifolds. With pressure cap.....Add	263.00	275	.....
& 690243	RADIATOR AND FAN. For water-cooled manifolds. With pressure cap.....Add	325.00	294	.....

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	605B-6A POWER UNIT *F.O.B. Minneapolis, Minnesota*			
	Additional Equipment - Factory Installed Only (Continued)			
& 690278	PUSHER-TYPE FAN. In place of standard fan. Requires 690063 fan guard...Add	6.50	-	.....
& 690063	FAN GUARD.....Add	26.00	10	.....
& 690234	INCLOSURES. Includes hood, support and side covers.....Add	99.00	190	.....
& 690004	ELECTRIC STARTING RECEPTACLE.....Add	14.50	1	.....
& 690238	GENERATOR, 12-Volt. Includes ammeter. Less battery cables.....Add	52.50	24	.....
690237	STARTING MOTOR, 12-Volt.....Add	96.50	40	.....
690250	MAGNETO. Low tension. In place of standard magneto.....Add	98.50	-	.....
690038	MAGNETO. Bendix-Scintilla S6RN-401. In place of standard magneto.....Add	5.25	-	.....
690240	AIR CLEANER. Dry-type. In place of oil bath.....Add	4.25	-	.....
& 690099	AUTOMATIC OIL LEVEL CONTROL. For use with heat exchanger base pan.....Add	21.00	1	.....
690239	HEAT EXCHANGER BASE PAN. In place of standard. Includes dual 6-1/2x9-inch filter.....Add	153.00	100	.....
690370	CYLINDER HEAD. 8.2:1 compression ratio. In place of standard for operation on LP gas not conforming to HD5 specifications.....Add	18.00	-	.....
& 690242	WATER COOLED MANIFOLDS. In place of standard.....Add	135.00	60	.....
	Additional Equipment - Not Factory Installed			
& 690277	SAE NO. 1 FLYWHEEL HOUSING.....	66.00	115	.....
& 690252	POWER UNIT LEGS. Front and rear. Requires flywheel housing.....	48.00	125	.....
690186	REMOTE CONTROL PANEL.....	63.50	15	.....
& 690012	SIGHT OIL GAUGE.....	8.00	2	.....
690097	ELECTRIC TACHOMETER. For magneto ignition.....	70.50	5	.....
690258	ELECTRIC TACHOMETER. For distributor ignition.....	70.50	5	.....
690350	NATURAL GAS REGULATOR. Includes screen and fittings.....	87.50	15	.....
690254	LP GAS VAPORIZER. (Ensign Model "NS"). Includes filter. Requires 690349 to install.....	93.50	25	.....
& 690349	BRACKETS, FITTINGS AND TUBING.....	27.00	12	.....
& 690059	POWER TAKE-OFF. Includes housing, clutch and shaft. Requires flywheel housing.....	317.00	257	.....
690257	RADIATOR AND FAN. For standard manifolds. With pressure cap.....	316.00	315	.....
690253	INCLOSURES. Includes hood, support and side covers.....	105.00	190	.....
690275	BATTERY CABLES.....	5.75	2	.....
& 690315	HEAT EXCHANGER EXPANSION TANK.....	61.50	80	.....
	Battery: Recommend (two) 12-volt, 11 plate, 72 ampere hour capacity.			

MINNEAPOLIS-MOLINE MM

BULLETIN NO. 1049 (4-67)

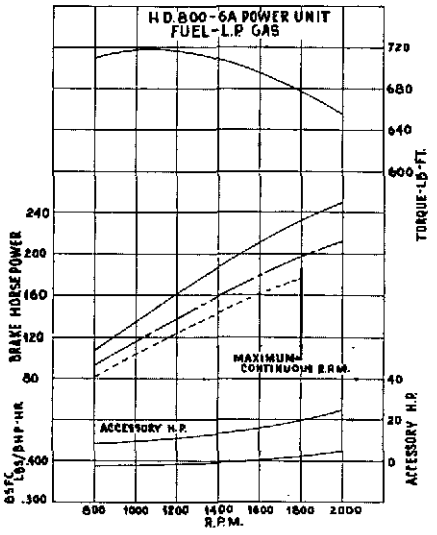
HD800-6A
INDUSTRIAL POWER UNIT



GENERAL DESCRIPTION

The Minneapolis-Moline HD 800-6A Power Unit is an 800 cubic inch engine capable of operating at 1800 RPM on continuous duty and 2000 RPM intermittent duty. At 2000 RPM this unit produces 250 horsepower with LP gas and 240 horsepower with natural gas. The HD 800-6A is a uniquely dependable, long life, heavy duty engine built for 24-hour-a-day service. Approximate weight—stripped, but with PTO, legs and instruments . . . 3,500 lbs.

PERFORMANCE



FOR STRIPPED ENGINES:

——— Maximum Output (29.92" Hg. & 60°F.)

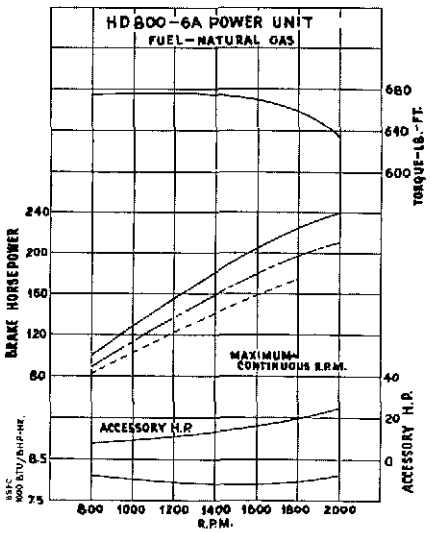
— — — • — Intermittent Rating

---------- Continuous Rating

NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.



Economical design—heavy crankcase with blocks and heads cast in pairs.

Heavy crankshaft and connecting rod design—with precision trimetal inserts, torsional vibration damper.

Cool running engine—controlled cooling system—large capacity water pump flows 95 GPM at 1800 RPM. Cooling system includes one-piece water outlet manifold, dual thermostats.

Full pressure lubrication throughout—oil system is joined with a large capacity gear lube pump that delivers 12 GPM @ 1800 RPM.

STANDARD EQUIPMENT

Std. base pan w/full flow filter.
Torsional damper fan drive pulley.
Positive crankcase ventilation.
Water pump and oil pump.
Manifolds and carburetor.
Governor.
Oil bath air cleaner.
Magneto spark plugs and cables.
Distributor spark plugs and cables.
Flywheel and ring gear
Lifting eye and muffler
Thermostat and by-pass.

ADDITIONAL EQUIPMENT

(Factory Installed Only)

Instrument panel and controls.
SAE No. 1 flywheel housing.
Power unit legs—front and rear. Requires 690276 SAE housing.
PTO clutch and clutch shaft. Requires 690276 SAE housing.
Radiator and fan with pressure cap. Standard manifolds.
Enclosures.
Fan guard.
Starting motor, 12 volt.
Generator, 12 volt.
Impco carburetor, N.G. or LPG.
Impco natural gas regulator
Impco LP gas vaporizor
Electric starting receptacle.
Dry type air cleaner in place of standard oil bath.
Automatic oil level control.
Safety switches. Magneto ignition—Murphy.
Safety switches. Distributor ignition—Murphy.
Pusher type fan. Requires fan guard 690063. Replaces std. fan.
Hourmeter, 12 volt.
Watercooled manifolds.
Radiator and fan with pressure cap. Water cooled manifolds.
Natural gas regulator and filter with fittings—Ensign.
LP gas vaporizer (Ensign model NS.) Requires 690289 to install.
Brackets, fittings and tubings (for LPG Vaporizer).
Bendix (S6RN-401) magneto in place of standard.
Low tension magneto, Fairbanks Morse. In place of standard magneto.
Heat exchanger base pan in place of std.
Vacuum gauge.
Murphy Vacuum panel.

ADDITIONAL EQUIPMENT

(Not Factory Installed)

Battery cables.
SAE No. 1 flywheel housing.
Legs, front and rear. Requires SAE No. 1 flywheel housing 690277.
Heat exchanger expansion tank.
Enclosures.
Sight oil gauge.
Electric tachometer for magneto ignition.
LP gas vaporizer—Ensign NS.
Brackets, tubing and fittings (for mounting NS vaporizer).
Natural gas regulator with filter and fittings—Ensign.
PTO clutch and clutch shaft. Requires SAE No. 1 flywheel housing.
Radiator and fan with pressure cap. Standard manifolds.
Electric tachometer distributor ignition.
Water-cooled manifold.
Rad. and fan w/press. for W-C manifolds.

HD 800-6A POWER UNIT

SPECIFICATIONS

GENERAL:
- Bore and stroke ..... 5-5/16"x6"
- Number of cylinders 6
- Piston displacement—cu. in 800
- *Piston speed* ..... 1 *fpm per rpm*
- Rotation facing flywheel end ..... CCW
- Max. HP @ 2000 RPM—250 LPG ..... 240 Natural Gas
- Compression ratio
  - Natural gas ..... 9.6:1 LP gas 8.3:1
- Compression pressure—psi (approximate)
  - natural gas ..... 215, LP gas 185

CRANKSHAFT:
- Material ..... Drop-forged steel, heat-treated and counter-balanced
- Bearings—
  - Number 4
- Size—
  - Front ..... 3½"Dx2"
  - Intermediate ..... Two—3½"Dx2⅛"
  - Rear ..... 3½"Dx3⅛"
  - Bearing type and material ..... Precision tri-metal

CYLINDERS:
- Cast ..... In pairs
- Material ..... Cast-iron
- Cylinder blocks ..... Removable

CYLINDER HEADS:
- Cast ..... In pairs
- Material ..... Cast-iron

CONNECTING RODS:
- Material ..... Drop-forged steel, heat treated
- Style ..... Forged I-section
- Bearing size ..... 3¼"Dx2-3/32"
- Bearing type and material ..... Precision tri-metal

PISTONS:
- Material ..... Aluminum alloy
- Rings—
  - Number 4
  - Compression ..... Three 3/32" wide
  - Oil ..... One 3/16" wide

PISTON PINS:
- Type ..... Full floating
- Bearing size ..... 1¾"Dx4½"
- Bushing material (in rod) ..... Bronze, steel-backed

CAMSHAFT:
- Material ..... Cast Proferall metal
- Number of bearings 4
- Drive ..... Helical gears

VALVE AND VALVE MECHANISM:
- Arrangement ..... In head
- Intake valves ..... Alloy steel
- Exhaust valves ..... Stellite faced
- Exhaust and Intake valve seat inserts ..... Stellite
- Tappet ..... Barrel type, ported
- Tappet material ..... Chilled cast-iron

IGNITION:
- Magneto ..... Heavy-duty, flange-mounted
- Spark plugs 18mm

OILING SYSTEM:
- Pump ..... Submerged gear, located in sump
- Pump capacity ..... 12 gpm @ 1800 rpm
- Filter ..... Replaceable cartridge type, in base pan
- Pressure points—
  - Rod, main and camshaft bearings, timing gears, *valve mechanism and governor, piston pin bushing*
- Base pan capacity—std. ..... 3½ gallons
- Oil level gauge ..... Sight glass
- Pressure gauge ..... On instrument panel

CRANKCASE VENTILATION:
- Breather ..... Oil wash
- Ventilator ..... Vacuum metering valve connected to intake manifold

BASE PAN:
- Cast iron ..... Liquid jacketed, heat-exchanger

FUEL SYSTEM:
- Carburetor ..... LPG or natural gas—XGI 2½ Ensign

COOLING SYSTEM
- Pump ..... Centrifugal, gear-driven 95 gpm @ 1800 rpm
- Coolant by-pass ..... Thermostatically controlled
- Fan ..... 24" dia.—6 blades on tapered roller bearings
- Fan and belt guard ..... Detachable, steel mesh
- Fan drive ..... Two V-belts
- Capacity with standard equipment ..... 19 gallons
- Radiator core ..... Tubular, lead-coated
- Tanks ..... Cast-iron top and bottom
- Radiator grille ..... Heavy punched steel
- Water temperature ..... Thermostatically controlled pressure system

POWER TAKE-OFF:
- Clutch ..... Double-disc 14" twin disc over center
- Shaft ..... 3" dia. with ¾" x ⅜" keyway
- Flywheel housing ..... SAE No. 1 flange
- Power take-off ..... SAE No. 1
- Power take-off shaft bearings ..... Two tapered roller
- Pilot bearing ..... Double row ball
- Lubrication ..... Pressure gun to pilot, clutch throwout, and shaft bearings
- Shifter ..... Can be mounted on either side

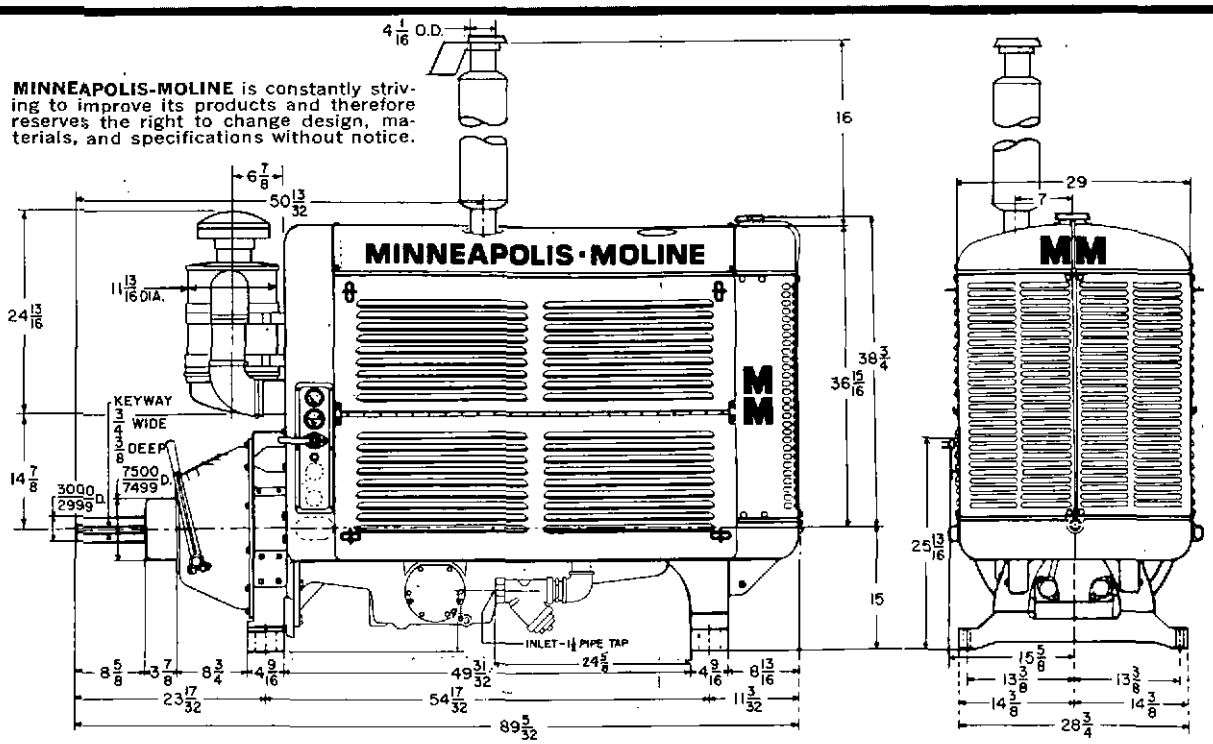
INSTRUMENT PANEL:
- Panel ..... Enclosed mounted on either side of unit
- Instruments and controls—
  - *Water temperature gauge, oil pressure gauge, hand* throttle and ignition switch. Provision for ammeter, starter button and starting cable receptacle.

ENCLOSURES:
- Hood—
  - Formed of heavy gauge steel, hinged at center, and securely bolted in place
- Side covers—
  - Heavy gauge steel hinged at center, and entirely removable. Top half may be folded down or bottom folded up and latched in place.
- Rear cover ..... Reinforced heavy gauge steel

SAFETY EQUIPMENT (Optional):
- *Oil pressure switch*—
  - Grounds magneto if oil pressure drops safe limit
- Water temperature switch—
  - Grounds magneto if temperature exceeds safe limit

MISCELLANEOUS:
- Governor ..... Gear driven flyball
- Muffler ..... Low-resistance
- Air cleaner ..... Rear-mounted oil bath standard, "Cyclopac" dry type optional
- Electric starting equipment ..... 12 volt with SAE flange mounted starter
- Electric starting receptacle ..... Plug-in type
- Tachometer drive ..... Mechanical or Electrical
- Torsional crankshaft damper
- Impco carburetor and Natural gas or LP Gas regulator in place of Ensign
- Heat exch. base in place of std.

MINNEAPOLIS-MOLINE is constantly striving to improve its products and therefore reserves the right to change design, materials, and specifications without notice.



MINNEAPOLIS·MOLINE®

MM® *Long Life Engines*

MINNEAPOLIS MOLINE INC., Hopkins, Minnesota

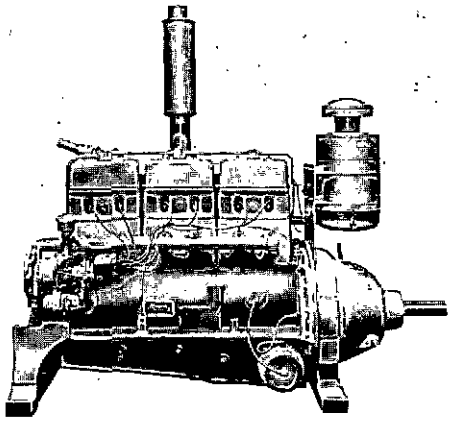
SOLD AND SERVICED BY:

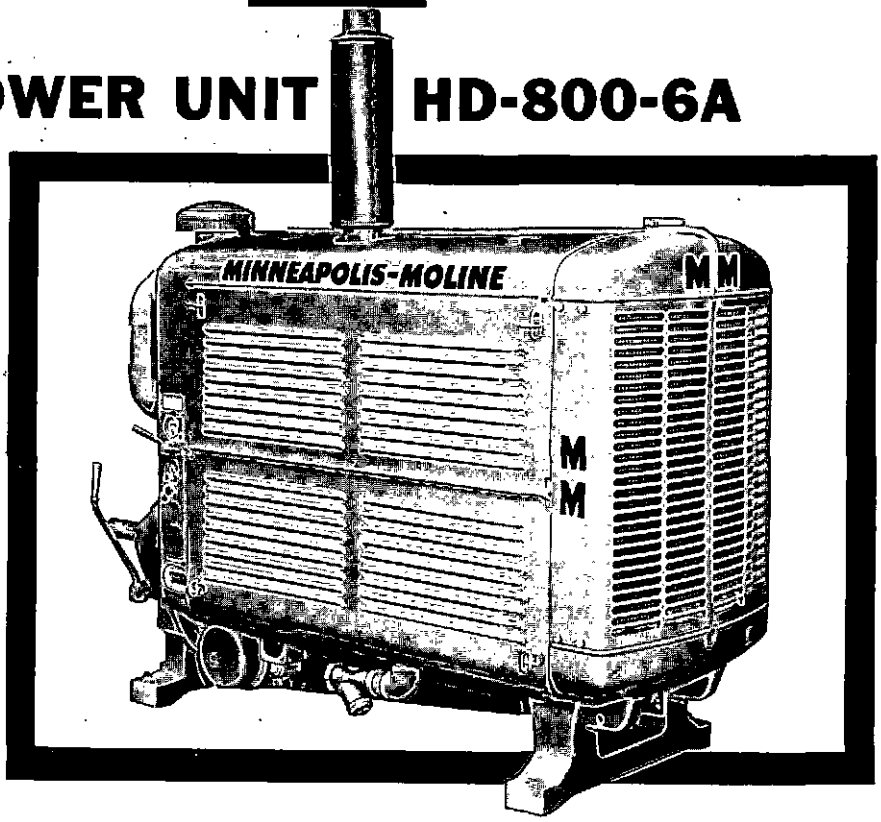
5-64 Printed in U.S.A.

BULLETIN NO. 1035 (3-66)

MINNEAPOLIS·MOLINE MM *Long Life Engines*

OIL FIELD POWER UNIT HD-800-6A





GENERAL DESCRIPTION

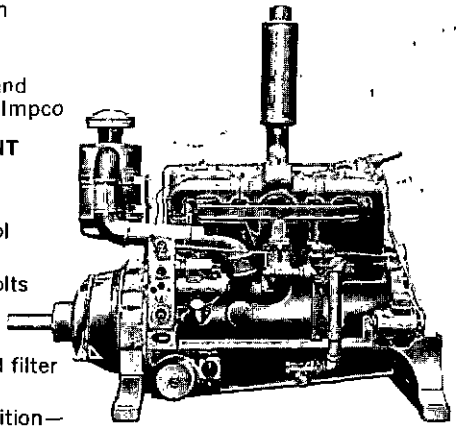
TYPE	6 CYL., VALVE IN HEAD
BORE	5-5/16"
STROKE	6"
APPROXIMATE WEIGHT	3,500 LBS.

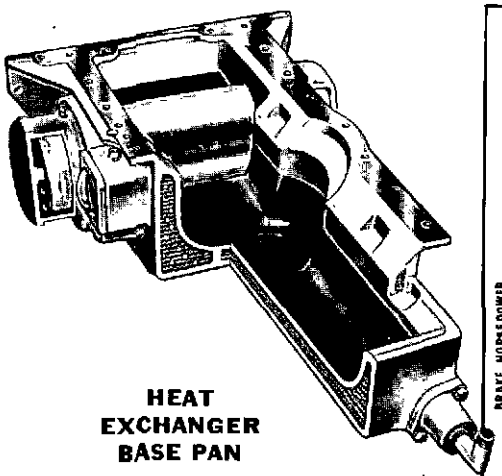
STANDARD EQUIPMENT:

Sheet metal enclosures
Hinged hood
Folding side doors
Legs, front and rear
Radiator and fan assembly
Radiator pressure cap
Instrument panel and controls
S.A.E. No. 1 flywheel housing
Muffler
Power take-off, housing, clutch
Twin disc clutch
Manifolds and carburetor
Heavy-duty magneto
Built-in governor
Oil pump and water pump
Oil pressure gauge
Water temperature gauge
Sight oil gauge
Water thermostat, by-pass
Water temperature cutout
Oil pressure cutout
Oil filter, replaceable cartridges
Oil bath air cleaner (stack-type)
Vacuum crankcase ventilation
Flywheel, fan drive pulley
Flywheel ring gear
Intake and Exhaust valve seat inserts, Stellite
Exhaust valves (Stellite faced)
Starter motor, 12 volt
Plug-in starting receptacle
Fan guard
Spark plugs and cables
Heat exchanger base pan
Aluminum pistons
Standard tools
Natural gas carburetor and regulator — Ensign or Impco

ADDITIONAL EQUIPMENT

Generator, 12 volt
Dry type air cleaner
Automatic oil level control
Pusher type fan
Distributor ignition, 12 volts
Hour meter
Electric tachometer
Natural gas regulator and filter
Battery cables
Low tension magneto ignition—Fairbanks Morse

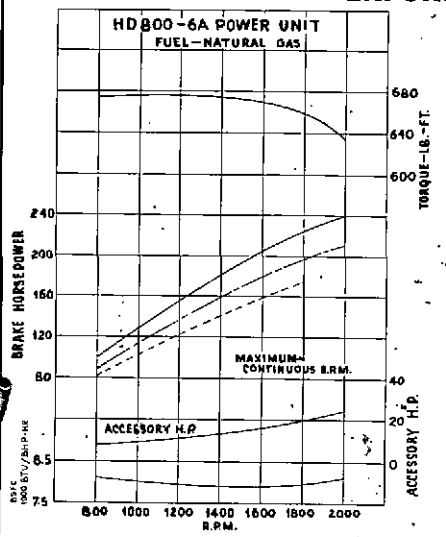




HEAT EXCHANGER BASE PAN

Water pump circulates engine water through base pan to maintain uniform engine and oil temperature. Results in quicker warm-up, less sludge, fewer oil changes, longer engine life.

PERFORMANCE



FOR STRIPPED ENGINES:

——— Maximum Output (29.92" Hg. & 60°F.)
— — — — Intermittent Rating
---------- Continuous Rating

NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

NOTE: Accessories include air cleaner, generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine curves.

SPECIFICATIONS FOR HD 800-6A OIL FIELD POWER UNIT

GENERAL:
- *Bore and stroke* ... 5-5/16"x6"
- Number of cylinders ... 6
- Piston displacement—cu. in. ... 800
- Piston speed ... 1 fpm per rpm
- Rotation facing flywheel end ... CCW
- *Max. HP @ 2000 RPM—Nat. Gas* ... 240
- Compression ratio
  - Natural gas ... 9.6:1
- Compression pressure—psi (approximate)
  - Natural gas ... 215

CRANKSHAFT:
- Material ... Drop-forged steel, heat-treated and counter-balanced
- Bearings—
  - Number ... 4
- Size—
  - Front ... 3½"Dx2"
  - Intermediate ... Two—3½"Dx2⅛"
  - Rear ... 3½"Dx3⅛"
  - Bearing type and material ... Precision tri-metal

CYLINDERS:
- *Cast* ... *In pairs*
- Material ... Cast-iron
- Cylinder blocks ... Removable

CYLINDER HEADS:
- Cast ... In pairs
- Material ... Cast-iron

CONNECTING RODS:
- Material ... Drop-forged steel, heat treated
- Style ... Forged I-section
- Bearing size ... 3¼"Dx2-3/32"
- Bearing type and material ... Precision tri-metal

PISTONS:
- Material ... Aluminum alloy
- Rings—
  - Number ... 4
  - Compression ... Three 3/32" wide
  - Oil ... One 3/16" wide

PISTON PINS:
- Type ... Full floating
- Bearing size ... 1¾"Dx4½"
- Bushing material (in rod) ... Bronze, steel-backed

CAMSHAFT:
- Material ... Cast Proferall metal
- Number of bearings ... 4
- Drive ... Helical gears

VALVE AND VALVE MECHANISM:
- Arrangement ... In head
- Intake valves ... Alloy steel
- *Exhaust valves* ... *Stellite faced*
- Exhaust and Intake valve seat inserts ... Stellite
- Tappet ... Barrel type, ported
- Tappet material ... Chilled cast-iron

IGNITION:
- Magneto ... Heavy-duty, flange-mounted
- Spark plugs ... 18mm

OILING SYSTEM:
- Pump ... Submerged gear, located in sump
- Pump capacity ... 12 gpm @ 1800 rpm
- Filter ... Replaceable cartridge type, in base pan
- *Pressure points*—
  - Rod, main and camshaft bearings, timing gears, valve mechanism and governor, piston pin bushing
- *Crankcase capacity* ... *6 gallons*
- Oil level gauge ... Sight glass
- Pressure gauge ... On instrument panel

CRANKCASE VENTILATION:
- Breather ... Oil wash
- Ventilator ... Vacuum metering valve connected to intake manifold

BASE PAN:
- Cast iron ... Liquid jacketed, heat-exchanger

FUEL SYSTEM:
- Carburetor ... Natural gas—XGI 2½ Ensign

COOLING SYSTEM:
- Pump ... Centrifugal, gear-driven 95 gpm @ 1800 rpm
- Coolant by-pass ... Thermostatically controlled
- Fan ... 24" dia.—6 blades on tapered roller bearings
- Fan and belt guard ... Detachable, steel mesh
- Fan drive ... Two V-belts
- Capacity with standard equipment ... 19 gallons
- Radiator core ... Tubular, lead-coated
- Tanks ... Cast-iron top and bottom
- Radiator grille ... Heavy punched steel
- Water temperature ... Thermostatically controlled pressure system

POWER TAKE-OFF:
- Clutch ... Double-disc 14" twin disc over center
- Shaft ... 3" dia. with ¾" x ⅜" keyway
- Flywheel housing ... SAE No. 1 flange
- Power take-off ... SAE No. 1
- *Power take-off shaft bearings* ... *Two tapered roller*
- Pilot bearing ... Double row ball
- Lubrication ... Pressure gun to pilot, clutch throwout, and shaft bearings
- Shifter lever ... Can be mounted on either side

INSTRUMENT PANEL:
- Panel ... Enclosed mounted on either side of unit
- Instruments and controls—
  - Safety oil pressure switch grounds magneto if oil pressure drops below safe limit. Water temperature switch grounds magneto if temperature exceeds safe limit. Ignition switch, starting switch, cannon type electric starting receptacle and hand throttle. Provision for ammeter and tachometer head.

ENCLOSURES:
- Hood—
  - Formed of heavy gauge steel, hinged at center, and securely bolted in place
- Side covers—
  - Heavy gauge steel hinged at center, and entirely removable. Top half may be folded down or bottom folded up and latched in place.
- Rear cover ... Reinforced heavy gauge steel

MISCELLANEOUS:
- Governor ... Gear driven flyball
- *Muffler* ... *Low-resistance*
- Air cleaner ... Rear-mounted oil bath standard. "Cyclopac" dry type optional
- Electric starting equipment ... 12 volt with SAE flange mounted starter
- *Electric starting receptacle* ... *Plug-in type*
- Tachometer drive ... Electrical
- Torsional crankshaft damper
- Impco carburetor and regulator—In place of Ensign

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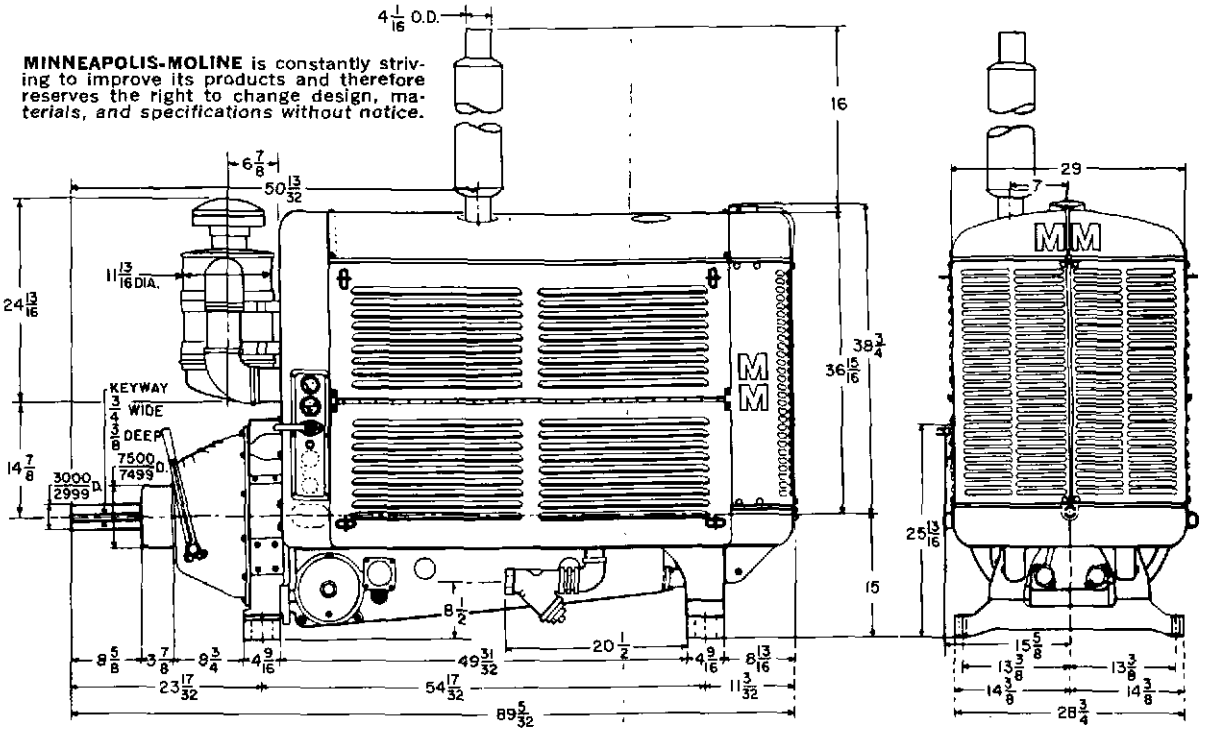

MINNEAPOLIS-MOLINE®

MM ***World's Finest Tractors***

MINNEAPOLIS-MOLINE, INC., Hopkins, Minnesota

SOLD AND SERVICED BY:

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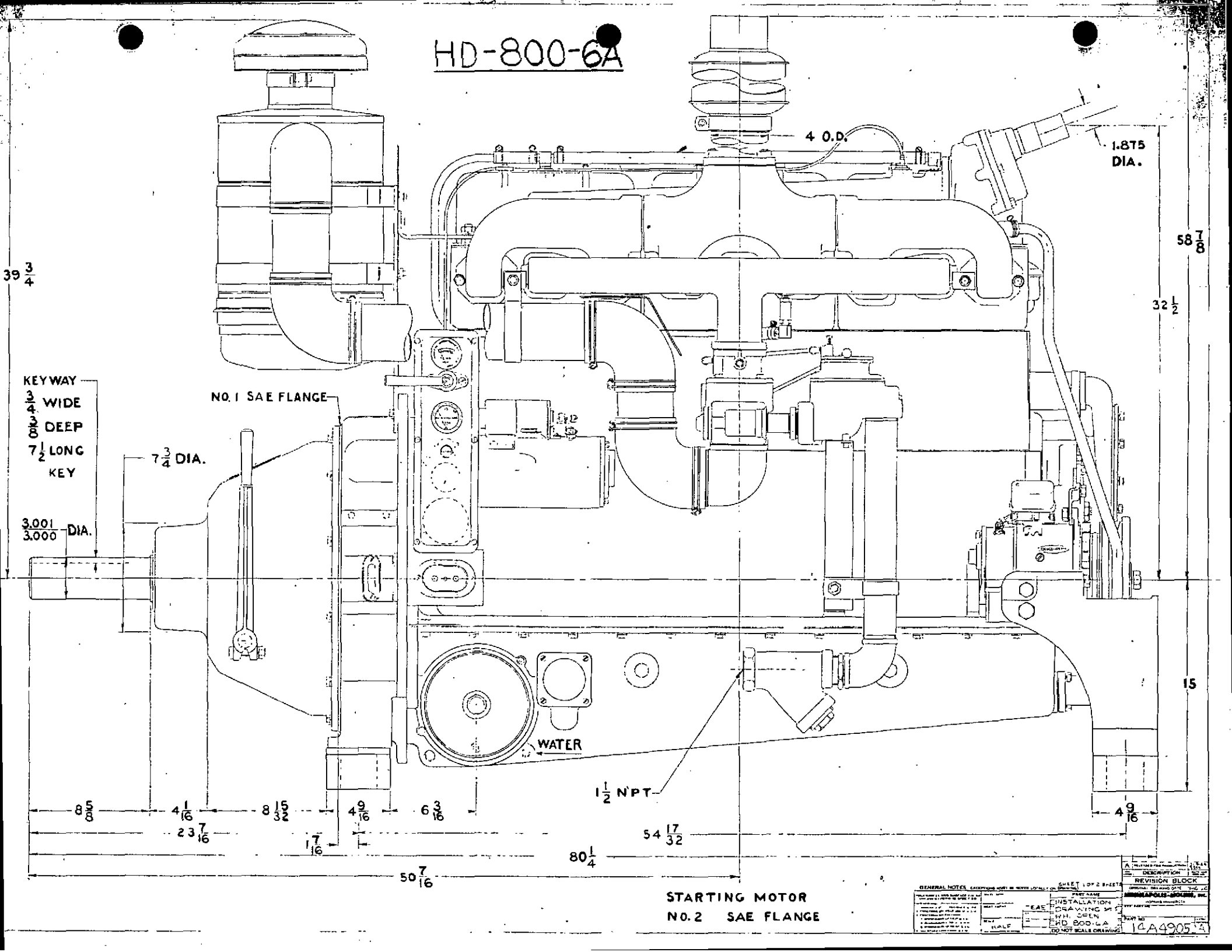
CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	HD800-6A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Standard Equipment			
	5-5/16x6 6-cylinder Moline engine. Magneto or distributor. Manifolds. Spark plugs and cables. Carburetor. Flywheel and ring gear. Water pump. Torsional damper fan drive pulley. Oil pump. Muffler. Oil filter. Thermostat and by-pass. Oil bath air cleaner. Positive crankcase ventilation. Governor. Lifting eye.			
	Basic Power Units - With plain base pan, Nos. 27002651 and after. Comp. Ratio			
+ 681413	HD800-6A BASIC POWER UNIT. Magneto - LP gas or natural gas.....8.3:1	—3065.00	2350	.....
+ 681423	HD800-6A BASIC POWER UNIT. Distributor - LP gas or natural gas.....8.3:1	3022.00	2350	.....
+ 681612	HD800-6A BASIC POWER UNIT. Magneto - natural gas only.....9.6:1	3065.00	2350	.....
+ 681622	HD800-6A BASIC POWER UNIT. Distributor - natural gas only.....9.6:1	3022.00	2350	.....
	Basic Power Units - With heat exchanger base pan, Nos. 27002650 and prior. Comp. Ratio			
# 681412	HD800-6A BASIC POWER UNIT. Magneto - LP gas or natural gas.....8.3:1	3105.00	2450	.....
# 681422	HD800-6A BASIC POWER UNIT. Distributor - LP gas or natural gas.....8.3:1	3064.00	2450	.....
# 681611	HD800-6A BASIC POWER UNIT. Magneto - natural gas only.....9.6:1	3105.00	2450	.....
# 681621	HD800-6A BASIC POWER UNIT. Distributor - natural gas only.....9.6:1	3064.00	2450	.....
	Fuel note: For operation on natural gas containing less than 80% methane, order Basic Power Unit with 8.3:1 compression ratio.			
	NOTE: Natural gas or LP gas power unit require a regulator or vaporizer to complete. See Additional Equipment.			
	NOTE: Basic unit does not include instrument panel, flywheel housing, power take-off, legs, radiator, fan or inclosures. See Additional Equipment.			
	Additional Equipment - Factory Installed Only			
& 690276	SAE NO. 1 FLYWHEEL HOUSING.....Add	— 63.50	115	.....
& 690231	POWER UNIT LEGS. Front and rear. Requires 690276 flywheel housing.....Add	— 48.00	125	.....
& 690319	INSTRUMENT PANEL AND CONTROLS. Less gauges. Requires 690320, 690321 or 690322.....Add	— 25.00	4	.....
690320	STANDARD GAUGES. Oil and temperature.....Add	— 9.25	1	.....
690321	SAFETY CUT-OUTS. (Murphy). Includes oil and temperature gauges. For magneto ignition.....Add	23.00	2	.....
690322	SAFETY CUT-OUTS. (Murphy). Includes oil and temperature gauges. For distributor ignition.....Add	35.25	2	.....
690111	HOURMETER. 12-Volt.....Add	33.25	2	.....
690141	VACUUM GAUGE. With shut-off valve. (Mounts on intake manifold).....Add	11.00	1	.....
690348	VACUUM PANEL. (Murphy). Automatic high-low vacuum shut-off.....Add	42.00		.....
& 690283	NATURAL GAS REGULATOR. Includes screen and fittings.....Add	84.00	15	.....
690246	LP GAS VAPORIZER. (Ensign Model "NS"). Includes filter. Requires 690289 to install.....Add	93.50	25	.....
& 690289	BRACKETS, FITTINGS AND TUBING.....Add	28.00	10	.....
690313	IMPCO NATURAL GAS REGULATOR. Includes screen. Requires 690318.....Add	—46.75	18	.....
& 690314	IMPCO LP GAS VAPORIZER-REGULATOR. Includes filter. Requires 690318.....Add	109.00		.....
690318	IMPCO CARBURETOR. For NG or LP gas in place of Ensign.....Add	— 15.00	-	.....

CATALOG NUMBER	DESCRIPTION	FACTORY LIST PRICE	WEIGHT POUNDS	
	HD800-6A POWER UNIT F.O.B. Minneapolis, Minnesota			
	Additional Equipment - Factory Installed Only (Continued)			
& 690259	POWER TAKE-OFF. Requires 690276 flywheel housing. Includes housing, clutch and shaft.....Add	401.00	375	.....
& 690260	RADIATOR AND FAN. For standard manifolds. With pressure cap.....Add	315.00	286	.....
& 690266	RADIATOR AND FAN. For water-cooled manifolds. With pressure cap.....Add	486.00	300	.....
690264	PUSHER-TYPE FAN. In place of standard. Requires 690063 fan guard.....Add	- 5.00	-	.....
& 690063	FAN GUARD.....Add	-26.00	10	.....
& 690234	INCLOSURES. Includes hood, support and side covers.....Add	99.00	190	.....
& 690004	ELECTRIC STARTING RECEPTACLE.....Add	14.50	1	.....
& 690238	GENERATOR. 12-Volt. Includes ammeter. Less battery cables.....Add	-52.50	24	.....
& 690262	STARTING MOTOR. 12-Volt.....Add	-185.00	55	.....
690250	MAGNETO. Low tension. In place of standard magneto.....Add	~~118.50~~	-	.....
690038	MAGNETO. Bendix-Scintilla S6RN-401. In place of standard magneto.....Add	5.25	-	.....
690263	AIR CLEANER. Dry-type. In place of oil bath.....Add	29.75	15	.....
+ 690368	HEAT EXCHANGER BASE PAN. In place of standard. Includes dual 6-1/2 x 9-inch filter. Nos. 27002651 and after.....Add	153.00	100	.....
& 690099	AUTOMATIC OIL LEVEL CONTROL. For use with heat exchanger base pan.....Add	21.00	1	.....
# 690271	BASE PAN. In place of heat exchanger base pan.....Deduct	78.00	-	.....
& 690265	WATER COOLED MANIFOLDS. In place of standard.....Add	135.00	60	.....
	Additional Equipment - Not Factory Installed			
& 690277	SAE NO. 1 FLYWHEEL HOUSING.....	66.00	115	.....
& 690252	POWER UNIT LEGS. Front and rear. Requires flywheel housing.....	48.00	125	.....
690186	REMOTE CONTROL PANEL.....	63.50	15	.....
& 690012	SIGHT OIL GAUGE.....	8.00	2	.....
690097	ELECTRIC TACHOMETER. For magneto ignition.....	70.50	5	.....
690258	ELECTRIC TACHOMETER. For distributor ignition.....	70.50	5	.....
690284	NATURAL GAS REGULATOR. Includes screen and fittings.....	89.50	15	.....
690254	*LP GAS VAPORIZER. (Ensign Model "NS"). Includes filter, Requires* 690290 to install.....	93.50	25	.....
& 690290	BRACKETS, FITTINGS AND TUBING.....	27.00	12	.....
& 690092	POWER TAKE-OFF. Includes housing, clutch and shaft. Requires flywheel housing.....	430.00	375	.....
690274	RADIATOR AND FAN. For standard manifolds. With pressure cap.....	345.00	330	.....
& 690317	RADIATOR AND FAN. For water-cooled manifolds. With pressure cap.....	535.00	344	.....
690253	INCLOSURES. Includes hood, support and side covers.....	105.00	190	.....
690275	BATTERY CABLES.....	5.75	2	.....
& 690315	HEAT EXCHANGER EXPANSION TANK.....	61.50	80	.....
& 690316	WATER-COOLED MANIFOLDS.....	223.00	100	.....
	11A17296 Starting crank. Available from parts.			
	Battery: Recommend (three) 12-Volt, 11 plate, 72 ampere hour capacity.			

HD-800-6A



STARTING MOTOR
NO. 2 SAE FLANGE

GENERAL NOTES

REVISION BLOCK

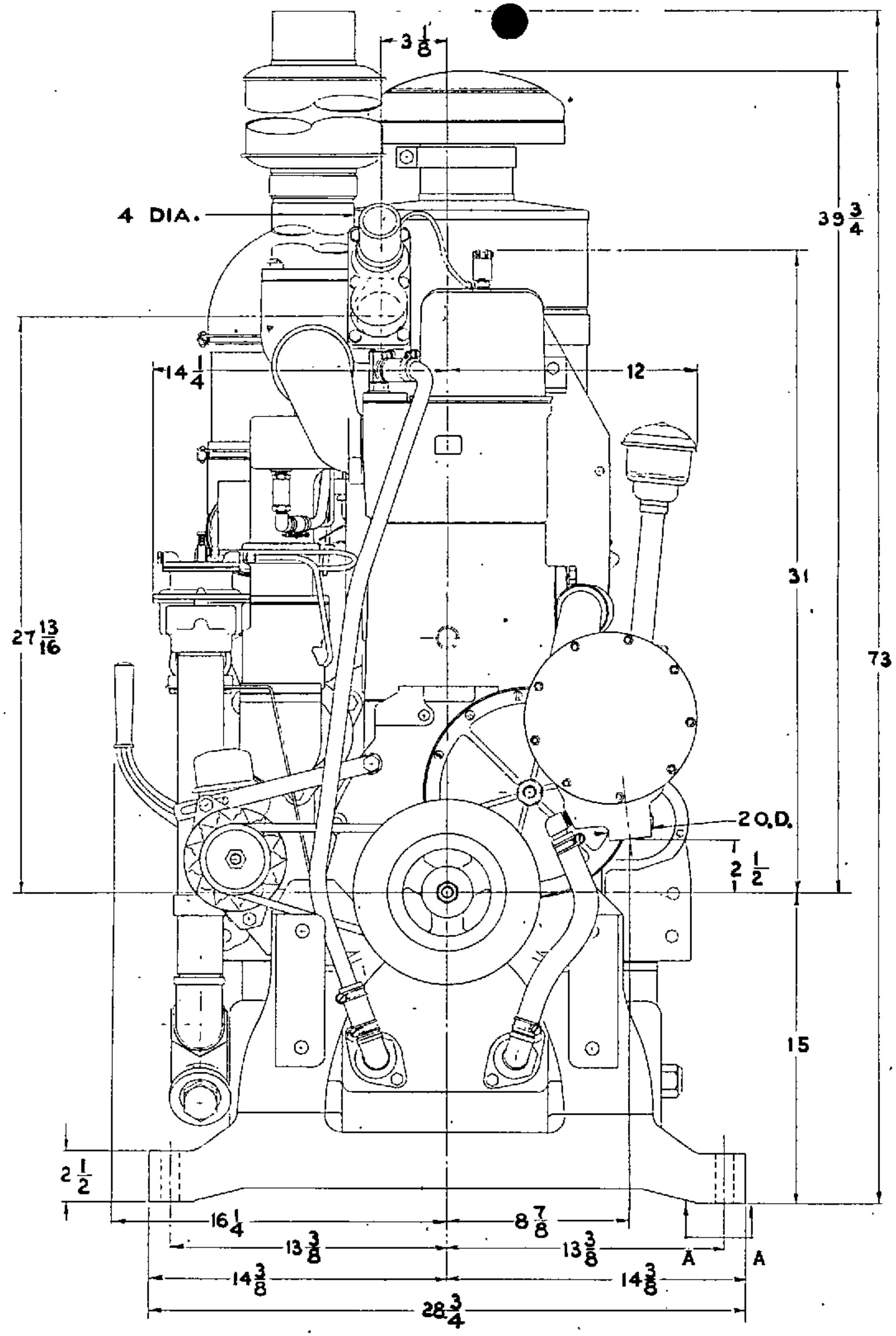
DESCRIPTION

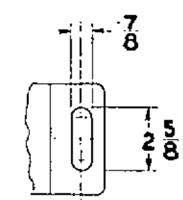
INSTALLATION DRAWING WITH OPEN HD 800-6A

DO NOT SCALE DRAWING

14A4905

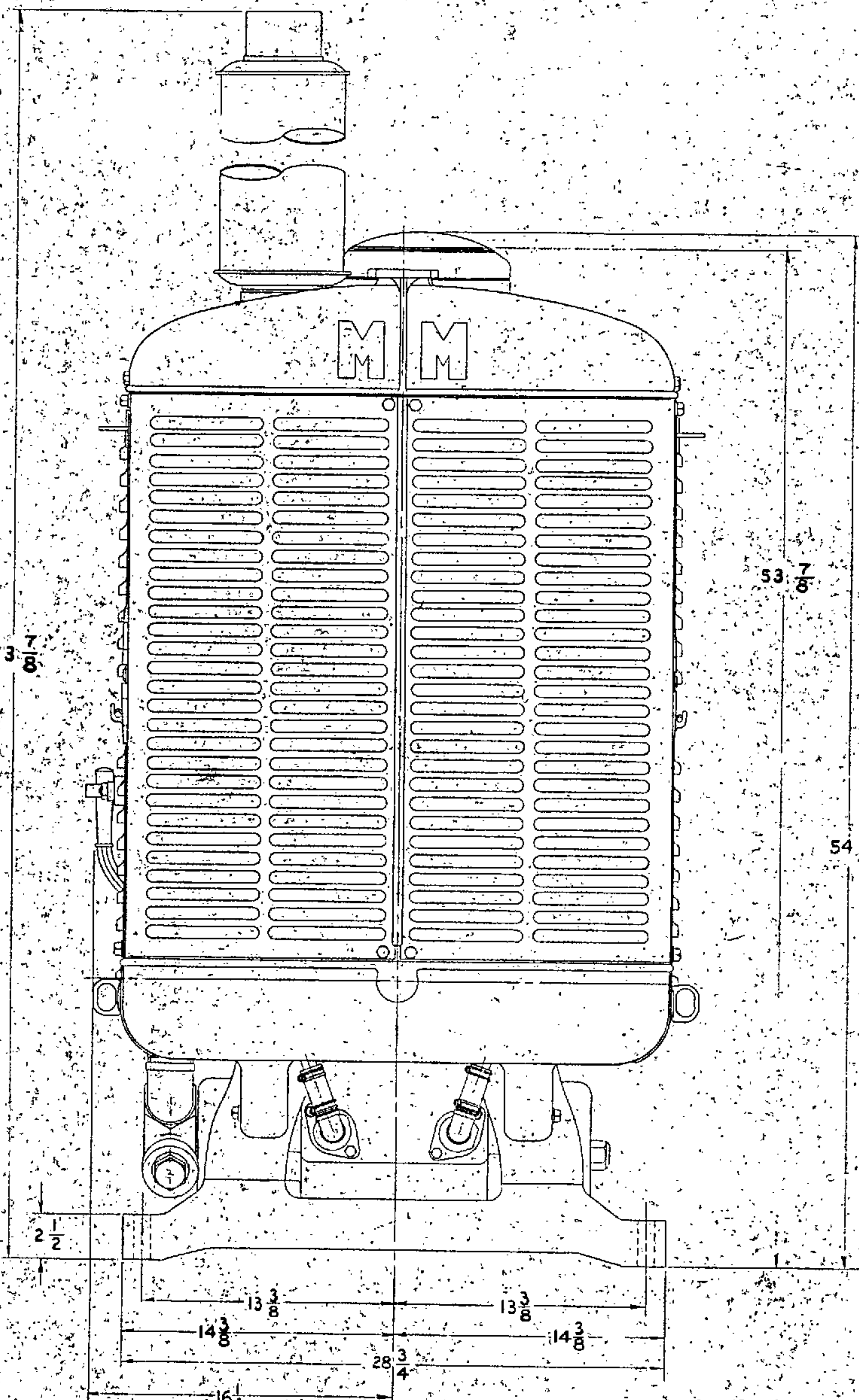
HD-800-6A

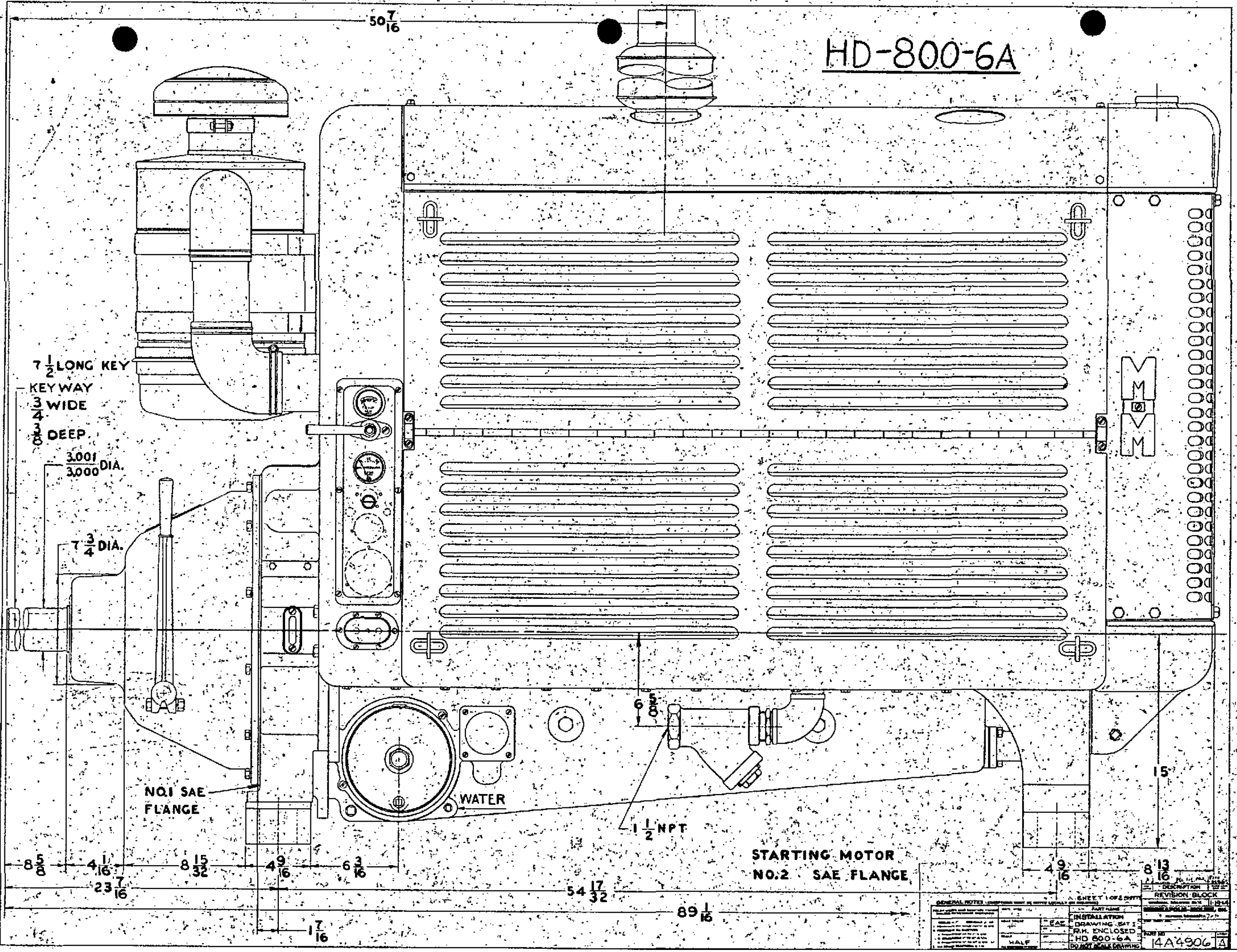




GENERAL NOTES	HALF	INSTALLATION DRAWING-FRONT OPEN SHEET 2 OF 2 HD 800-6A
DO NOT SCALE DRAWING	REVISION BLOCK	14A4905 A

HD-800-6A



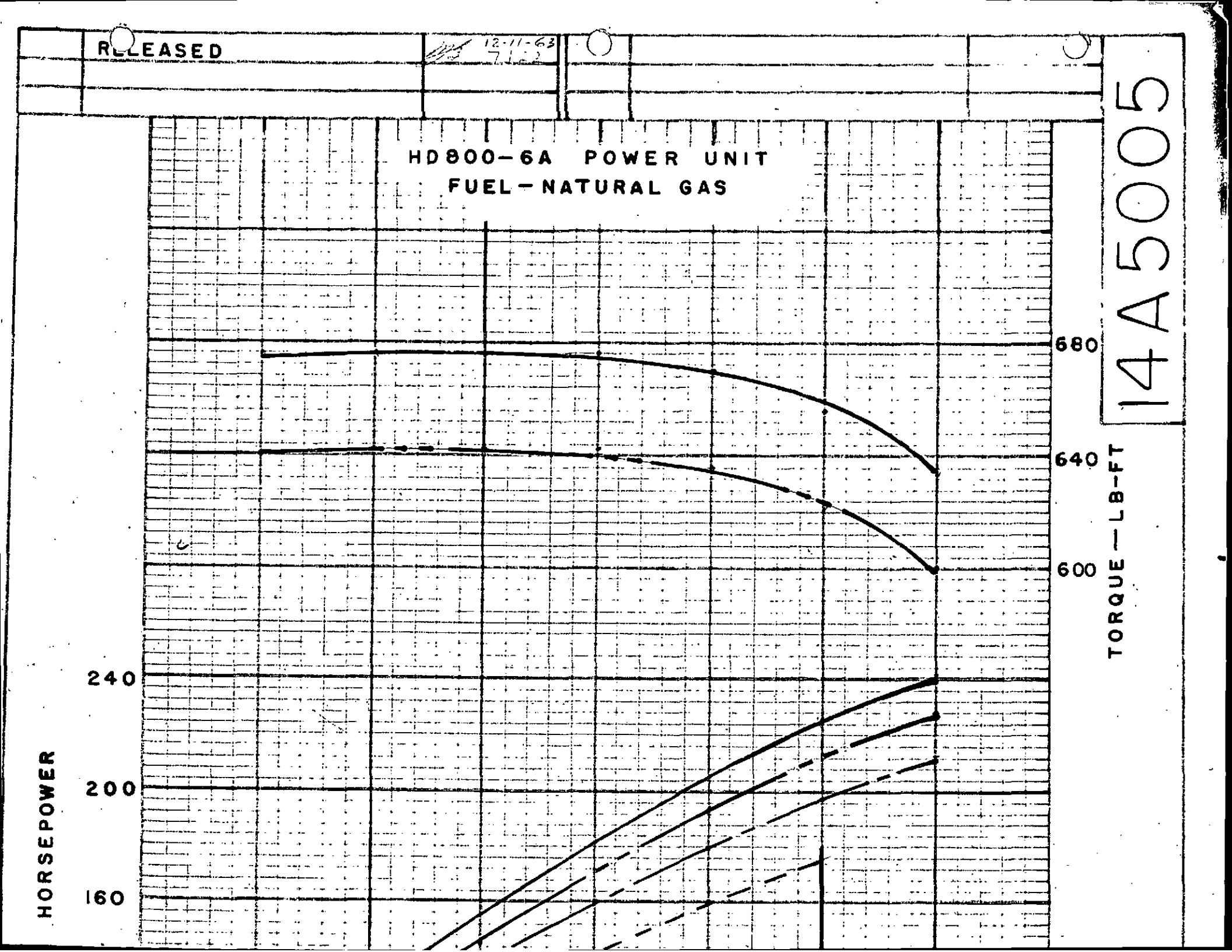


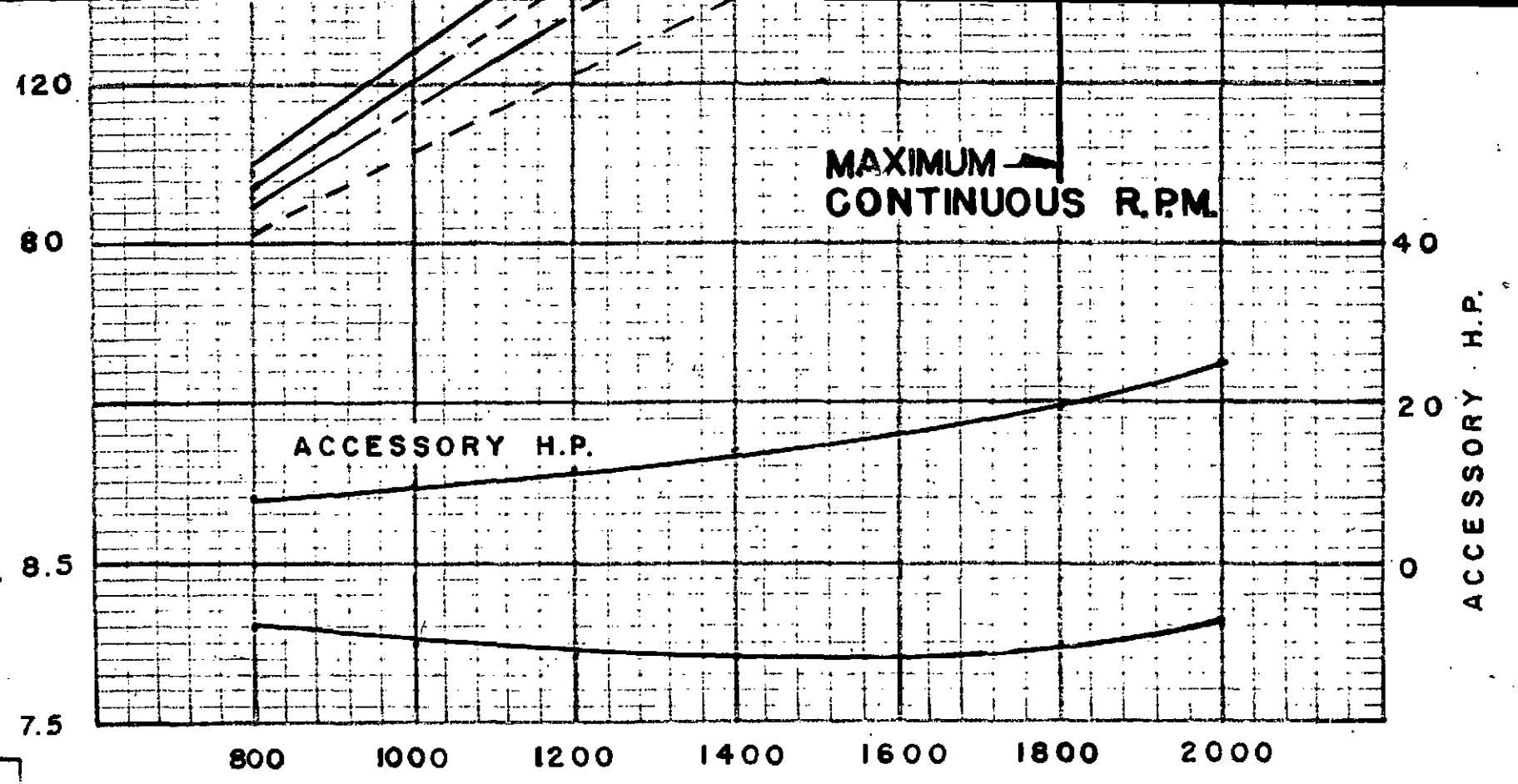
HD-800-6A
50 7/16
7 1/2 LONG KEY
KEYWAY
3/4 WIDE
3/8 DEEP
3.001/3.000 DIA.
7 3/4 DIA.
NO.1 SAE FLANGE
WATER
6 5/8
1 1/2 NPT
STARTING MOTOR
NO.2 SAE FLANGE
15
8 5/8
4 1/16
8 15/32
4 9/16
6 3/16
23 7/16
54 17/32
89 1/16
1 7/16
4 9/16
8 13/16
REVISION BLOCK
DESCRIPTION
GENERAL NOTES
SHEET 1 OF 2 SHEETS
PART NAME
INSTALLATION DRAWING SHT I
R.H. ENCLOSED
HD 800-6A
DO NOT SCALE DRAWING
HALF
14A4906 A

RELEASED 12-11-63

14A5005

HD800-6A POWER UNIT
FUEL - NATURAL GAS





FOR STRIPPED ENGINES:

- Maximum Output (29.92 + 60°F.)
- Maximum Output-SAE J816 (29.00 + 85°F.)
- Intermittent Rating
- Continuous Rating

NOTE: To determine allowable intermittent or continuous duty horsepower at any altitude or temperature conditions, use the values shown on the rating curves, or 95% of available BHP whichever is lower.

Cylinder heads-10A4229 (Compression ratio:9.6:1)
Carburetor-10A19440 2 1/2 Ensign-CBY 250A 5506A
Camshaft - 10A19776

Tests run with fuel LHV=1000 BTU/FT^3. Fuel consumption based on assumed LHV=900 BTU/FT^3.

NOTE: Accessories include air cleaner generator, fan, radiator, enclosures.

NOTE: To determine rating of completely equipped units, deduct accessory HP from stripped engine units.

Intake Manifold - 10A19120
Exhaust Manifold - 10A20274, 75, 76
Muffler - 10A17881

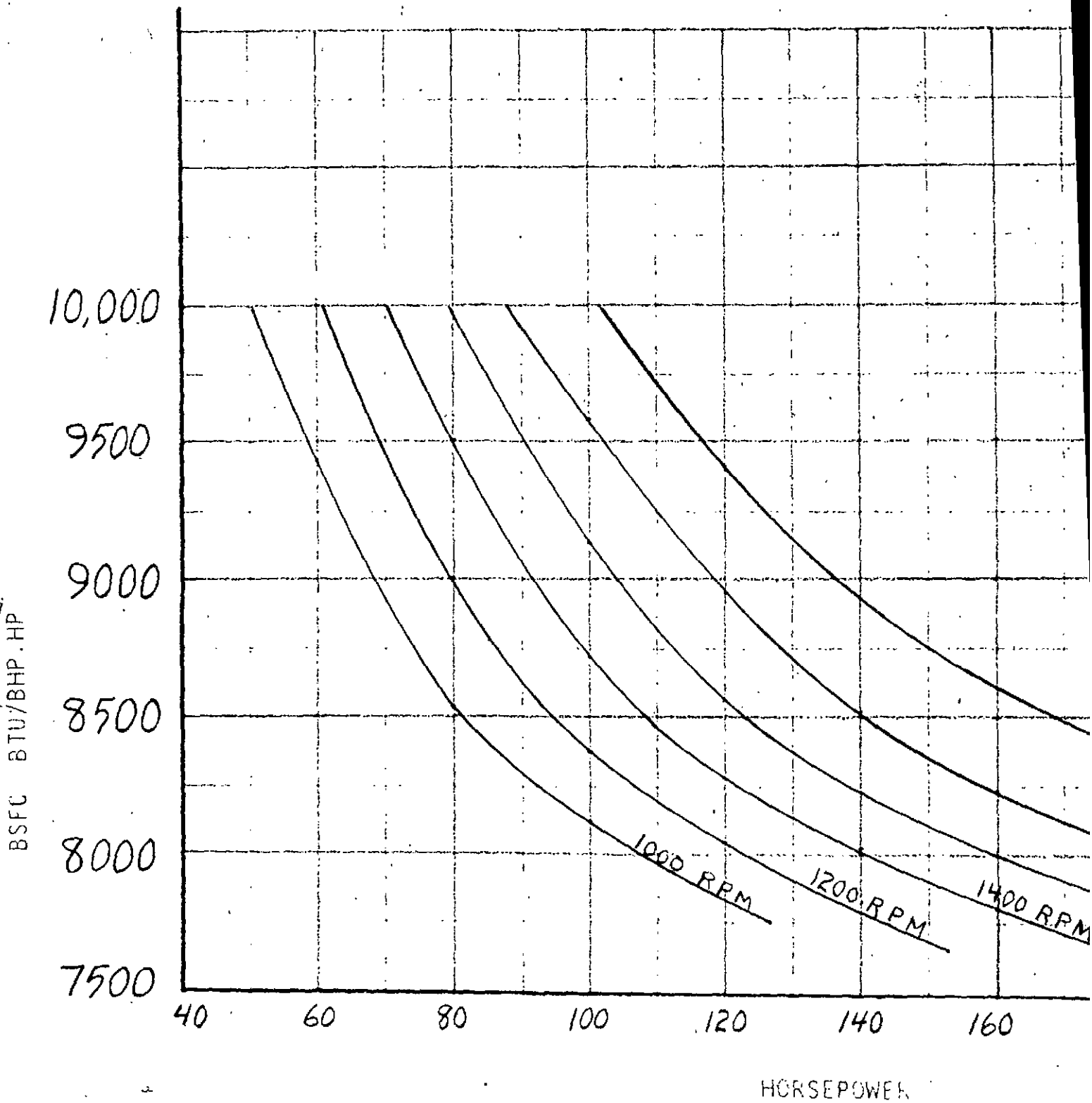
14A5005

14A5005

HD800-

FUEL CONSUMPTION - ST

ECONOMY FUEL



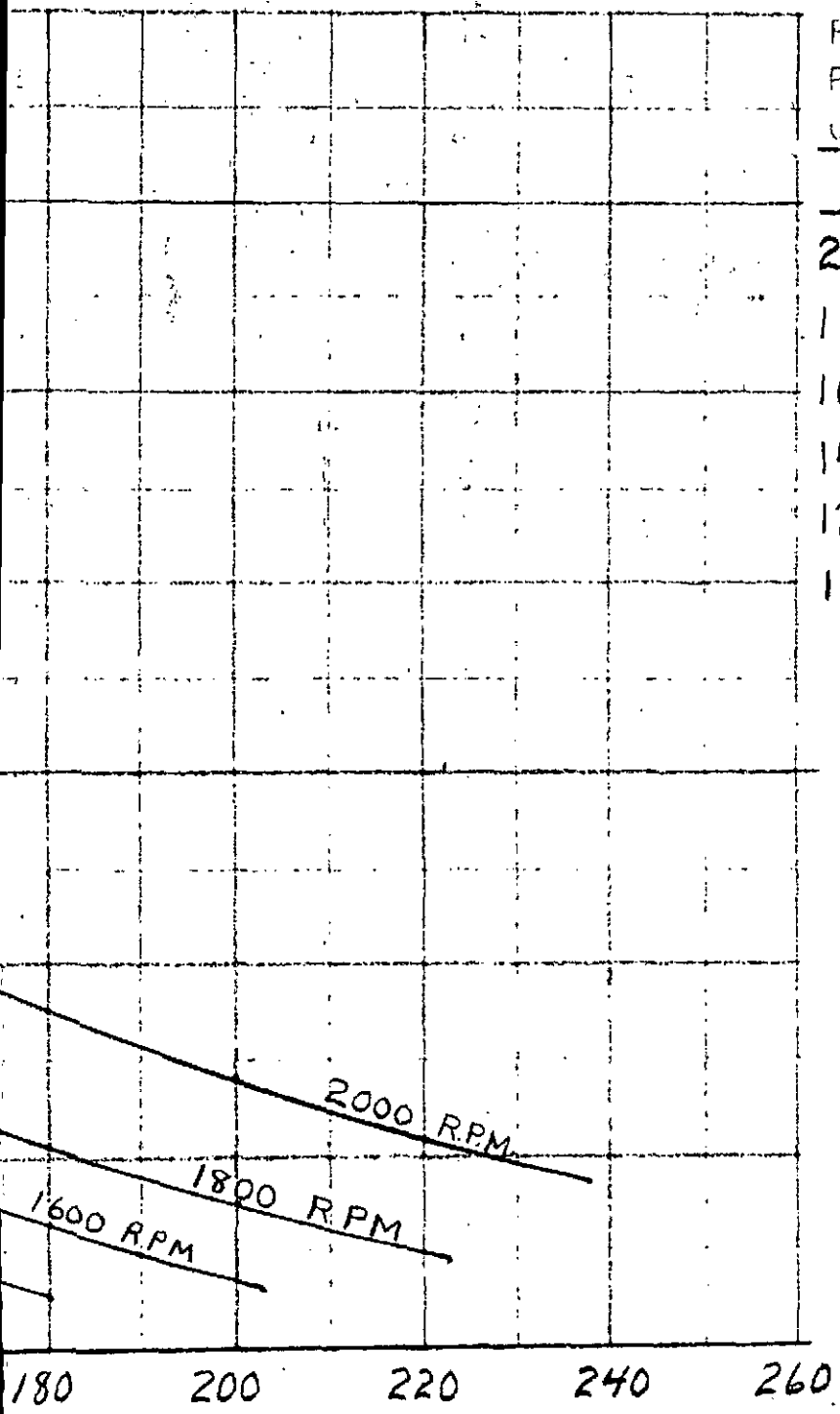
HORSEPOWER FIGURES ARE REFERENCED TO SEA LEVEL CONDITIONS - 29.92 IN. HG., 60°F. FUEL LHV = 900 BTU/FT.^{3}

CARBURETOR ADJUSTED LEAN TO GIVE 1% POWER LOSS.

6A

PPED ENGINE

SETTING



FOR COMPLETE POWER UNIT FUEL CONSUMPTION ADD:

RPM	BTU/HR.
2000	212,000
1800	159,000
1600	132,000
1400	107,000
1200	91,000
1000	74,000

REVISIONS

A REL. FOR PROD 12-15-66 8993

MINNEAPOLIS-MOLINE, INC. HOPKINS, MINNESOTA

SHEET ____ OF ____

UNLESS OTHERWISE SPECIFIED		
ANGULAR DIMENSIONS		± 30'
DIMENSIONS TO CAST AND WELDMENT SURFACES	DIM 0 TO 4"	± .030
	DIM 4" TO 16"	± .060
	DIM 16" TO 30"	± .090
ALL OTHER DIMENSIONS		± .010

DR | DATE

CK ROW | SCALE

APP GK | MATL

DO NOT SCALE DRAWING

NAME: PART LOAD FUEL CONSUMPTION

NUMBER: 14A6078 | REVISION: A

IRRIGATION POWER UNIT COOLING COILS

SECTION I - GENERAL

There are two basic factors to be considered when selecting plumbing size, and selecting or fabricating a heat exchanger for power unit irrigation applications:

1. The heat transfer area of the tubing or coil must be sufficient to dissipate the heat generated by the engine.

2. The flow area (tubing size and length) for the engine coolant must be sufficient so as not to cause an excessive pressure drop from the engine outlet to the pump inlet. (A 5 PSI pressure drop is considered excessive.)

The following conditions are considered to be standard, and the information in the tables is based on these conditions:

1. The discharge water is assumed to be 50° F., or less.

2. The discharge water velocity is assumed to be 5 ft/sec., or greater.

3. Copper tubing is used for the cooling coil or in the heat exchanger.

4. The cooling tubing is assumed to run parallel to the discharge pipe.

5. The heat rejection, and consequently the cooling system design, is based on intermittent horsepower and speed.

6. The maximum allowable pressure drop from engine outlet to pump inlet is 5 PSI. (A pressure drop in excess of this may cause pump cavitation.)

Minneapolis-Moline strongly recommends copper tubing in the cooling coil in the discharge because of its excellent heat transfer characteristics and resistance to corrosion. It is also generally good economics to use copper tubing to and from the engine to minimize corrosion and avoid periodic replacement.

The use of Minneapolis-Moline expansion tank with the 7 pound pressure tank is also recommended to prevent pump cavitation and eliminate the resulting hot spots and steam pockets in the coolant.

Table 1 shows the required information to construct an efficient cooling system when the above standard conditions prevail.

NOTES:

1. This tubing diameter is the MINIMUM recommended diameter of the tubing to and from the engine. It is also the minimum size to be used when the tubing in the cooling coil is in series.

2. The maximum equivalent length is the maximum permissible length of the ENTIRE cooling system. It includes the cooling tubing and the tubing TO AND FROM the cooling tubing. Each bend causes a resistance to flow which equals a certain length of tubing (see Table 6) and must be deducted from the total permissible length to determine maximum equivalent length.

SECTION II - CORRECTION FACTORS (FOR APPLICATIONS WHERE THE ABOVE STANDARD CONDITIONS DO NOT APPLY)

1. If the discharge water temperature is above 50° F., a greater length of cooling tubing is required. Table

TABLE 1

	220-4A	336A-4A	425A-6A	HD504-6A	605A-6A	HD800-6A
Heat Rejection at Int. H.P. (B.T.U./Hr.)	124,000	155,000	188,000	275,000	255,000	444,000
Required heat transfer area (sq. in) (In cooling coil or exchanger)	900	900	1,100	1,500	1,400	2,200
Recommended tubing diameter & length in cooling water (See note 1)	1-1/4"-20' 1-1/2"-15'	1-1/4"-20' 1-1/2"-15'	1-1/2"-20' 2"-15'	1-1/2"-25' 2"-20'	1-1/2"-25' 2"-20'	2"-30' 2-1/2"-25'
Maximum equivalent length in Ft. (See note 2)	1-1/4"-70' 1-1/2"-165'	1-1/4"-45' 1-1/2"-90'	1-1/2"-75' 2"-230'	1-1/2"-50' 2"-160'	1-1/2"-58' 2"-210'	2"-70' 2-1/2"-190'

2 shows the Correction Factor to use for various water temperatures over 50°. The Correction Factor must be multiplied by the recommended length of the cooling tubing in the cooling water.

EXAMPLE:

An HD800-6A unit requires 30 feet of 2 inch tubing when water temperature is 50° or less (from Table 1).

If water temperature is 70°, multiply 30 feet by 1.20 (Correction Factor from Table 2).

Therefore, the system would require 36 feet of 2 inch tubing, rather than 30 feet.

TABLE 2

CORRECTION FACTOR FOR WATER TEMPERATURE

50° or cooler - No Correction Required

55° Water - Correction Factor = 1.04

60° Water - Correction Factor = 1.08

65° Water - Correction Factor = 1.14

70° Water - Correction Factor = 1.20

75° Water - Correction Factor = 1.28

80° Water - Correction Factor = 1.37

85° Water - Correction Factor = 1.45

90° Water - Correction Factor = 1.55

2. If the discharge water velocity is less than 5 feet per second, additional cooling tubing is required to compensate for the reduced flow. Table 3 shows the Correction Factor to be applied to the length of cooling tubing shown in Table 1.

EXAMPLE:

If the discharge pipe diameter is 10", and the flow is 1000 GPM, the Correction Factor is 1.10 (from Table 3).

Multiply 1.10 by the standard length of the cooling tubing shown Table 1. The result is the amount of tubing required when the flow is less than 5 ft/sec.

NOTE: IF THE WATER TEMPERATURE IS ABOVE 50° F., AND THE FLOW IS LESS THAN 5 FT/SEC., BOTH CORRECTION FACTORS MUST BE APPLIED.

3. If the power unit is equipped with water cooled manifolds, additional cooling tubing is required to dissipate the added heat in the engine coolant.

The Correction Factor for water cooled manifolds is 1.3. Multiply 1.3 by the length of cooling tubing specified in Table 1.

EXAMPLE:

Table 1 shows that a standard HD800-6A unit requires 30 feet of 2 inch tubing. If the unit has water cooled manifolds, it requires (1.3 x 30), or 39 feet of tubing.

NOTE: THIS CORRECTION FACTOR MUST BE APPLIED IN ADDITION TO WATER TEMPERATURE AND FLOW CORRECTION FACTORS.

TABLE 3

DISCHARGE WATER VELOCITY

WELL DISCHARGE PIPE DIAMETER

G.P.M.	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"
500				1.25	1.42	1.69	1.85									
1000					1.05	1.10	1.17	1.25	1.42	1.69	1.85					
1500								1.09	1.17	1.25	1.34	1.47	1.63	1.85		
2000									1.05	1.13	1.17	1.25	1.28	1.42	1.57	1.63
2500											1.05	1.13	1.18	1.25	1.38	1.42
3000													1.08	1.13	1.17	1.18

ALL VALUES IN SHADED AREA FALL WITHIN STANDARD SPECIFICATIONS (MORE THAN 5 FT/SEC FLOW) AND DO NOT NEED A CORRECTION FACTOR

SECTION III - FABRICATING HEAT EXCHANGERS

In addition to the general conditions specified in Section I, the following specific conditions apply:

1. Use smooth bends with an inside radius of at least twice pipe diameter.

2. When using heat exchangers with tubing in series, the tubing diameter and the length of tubing exposed to the cooling water in the discharge should be as determined from Table 1 and any applicable Correction Factors.

3. When fabricating parallel flow heat exchangers, the tubing size will be determined by the number of passes. Use Table 4 to determine tubing size. To determine the required length of each pass exposed to the cooling water, proceed as follows:

   a. Obtain the required heat transfer area from Table 1.

   b. The recommended tubing diameter to and from the parallel heat exchanger is the same as the "Recommended Tubing Diameter ..." in Table 1.

   c. Select the desired tubing size and number of passes required (inside the parallel heat exchanger) from Table 4.

   d. From Table 5, determine the heat transfer area per foot of tubing length.

   e. Divide the total required heat transfer area (from Table 1) by the heat transfer area per foot of tubing (from Table 5). The result is the total length of tubing required in the exchanger.

   f. Apply any applicable Correction Factors to this result.

   g. Divide this corrected length by the total number of passes (from Table 4). The result is the total length per pass.

SECTION IV - SELECTING COMMERCIAL HEAT EXCHANGERS

In general, the manufacturer's recommendations should be followed when sizing commercial heat exchangers, and the adequacy of the recommended exchanger can be evaluated by considering the factors outlined in the preceding sections.

SECTION V - RESISTANCE OF BENDS TO FLOW

Each bend in the system causes a resistance in flow, which is equivalent to a certain length of tubing. This length must be deducted from the maximum equivalent length. Table 6 shows the equivalent length of tubing or pipe for each bend. Count the number of bends in the system, multiply by the figure obtained from Table 6, and subtract from the maximum equivalent length (from Table 1).

EXAMPLE:

Tubing diameter is 2". There are four 90° bends in the system. Each bend is equivalent to 2 ft. of tubing. Therefore, 4 bends are equivalent to 8 ft. of tubing. This 8 ft. must be subtracted from the maximum equivalent length shown in Table 1.

TABLE 4

Recommended Minimum Pipe Size for Parallel Flow Heat Exchangers

Minimum Pipe Size From Table 1	Number of Parallel Tubes					
	2	4	6	8	10	12
1-1/4	1	3/4	3/4	1/2	1/2	1/2
1-1/2	1-1/4	1	1	3/4	3/4	3/4
2	1-1/2	1-1/4	1	1	1	1
2-1/2	2	1-1/2	1-1/4	1-1/4	1-1/4	1-1/4

TABLE 5

Heat Transfer Area Per Foot of Length

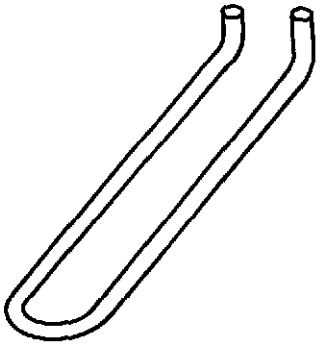
	Pipe Dia. (in.)						
	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2
Heat Transfer Area Per Linear Foot of Pipe (In Square Inches)	18.8	28.2	37.6	47.1	56.4	75.3	94.0

TABLE 6

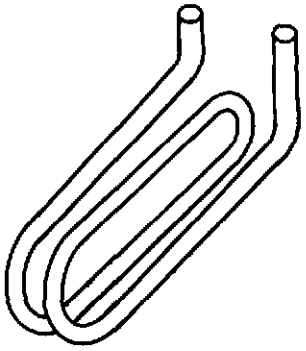
Resistance of Bends to Flow-Equivalent Length in Feet of Pipe. (Centerline Bend Radius=2 Times Pipe Dia.)

Pipe Dia. (In.)	Copper Pipe			Galvanized Pipe	
	45°	90°	180°	45°	90°
1-1/4	5/8'	1-1/4'	2-1/2'	1-1/2'	3'
1-1/2	3/4'	1-1/2'	3'	2'	3-1/2'
2	1'	2'	4'	2-1/2'	4-1/2'
2-1/2	1-1/4'	2-1/2'	5'	3'	5-1/2'

2 Pass Series



4 Pass Series



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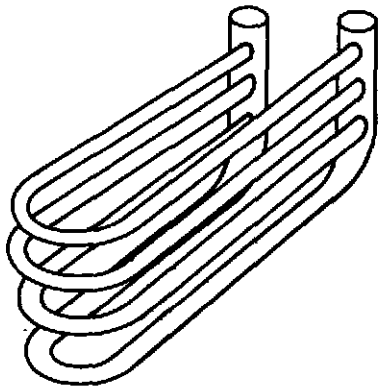


MINNEAPOLIS-MOLINE, INC.

HOPKINS, MINNESOTA

REVISIONS

$\frac{3}{8}$ - 16 UNC - 2B, 12 HOLES EQUALLY SPACED ON $20\frac{7}{8}$ DIA B.C.

$\frac{1}{2}$ - 13 UNC - 2B, 8 HOLES EQUALLY SPACED ON 17.250 DIA B.C.

130

127

REF

2. FLYWHEEL HOUSING PER S.A.E. J617 S.A.E. #1

1. FLYWHEEL PER S.A.E. J 620 FOR 14" CLUTCH.

10123	2-27-67	A
RELEASE FOR PRODUCTION		

MINNEAPOLIS-MOLINE, INC. HOPKINS, MINNESOTA

SHEET 1 OF 1

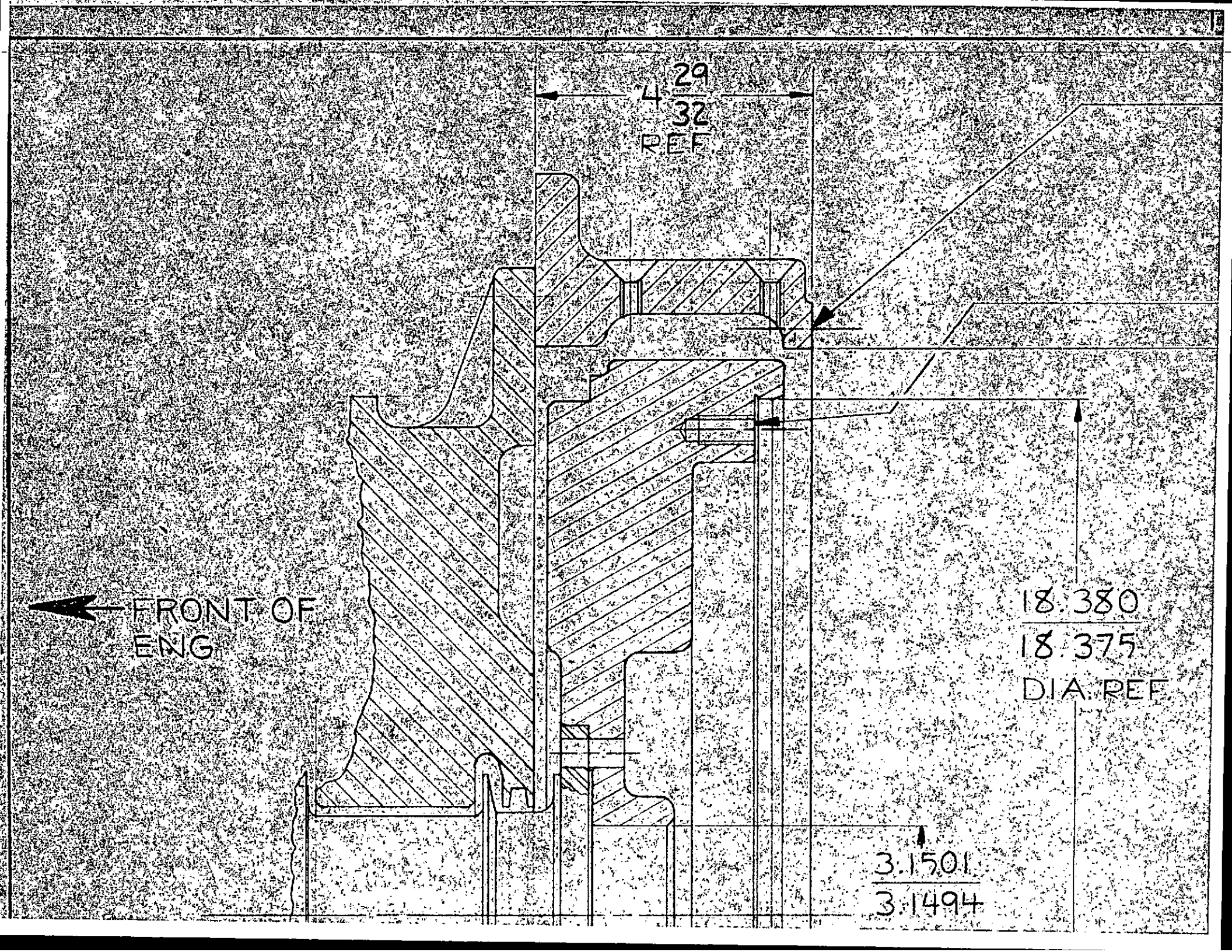
UNLESS OTHERWISE SPECIFIED			DR LM MP	DATE 2-25-66	NAME FLYWHEEL HOUSING ASSY HD800-6A
ANGULAR DIMENSIONS		± 30'	CK G.K.	SCALE FULL	
DIMENSIONS TO CAST AND WELDMENT SURFACES	DIM 0 TO 4"	± .030	APP	FINISH	
	DIM 4" TO 14"	± .060			
	DIM 14" TO 20"	± .090			
ALL OTHER DIMENSIONS		± .030	DO NOT SCALE DRAWING		

NUMBER	REVISION
14A6109	A

FRACTIONS OTHER THAN TO CAST AND WELDMENT SURFACES ± .030

ONE PLACE DECIMALS ± .030

TWO PLACE DECIMALS ± .010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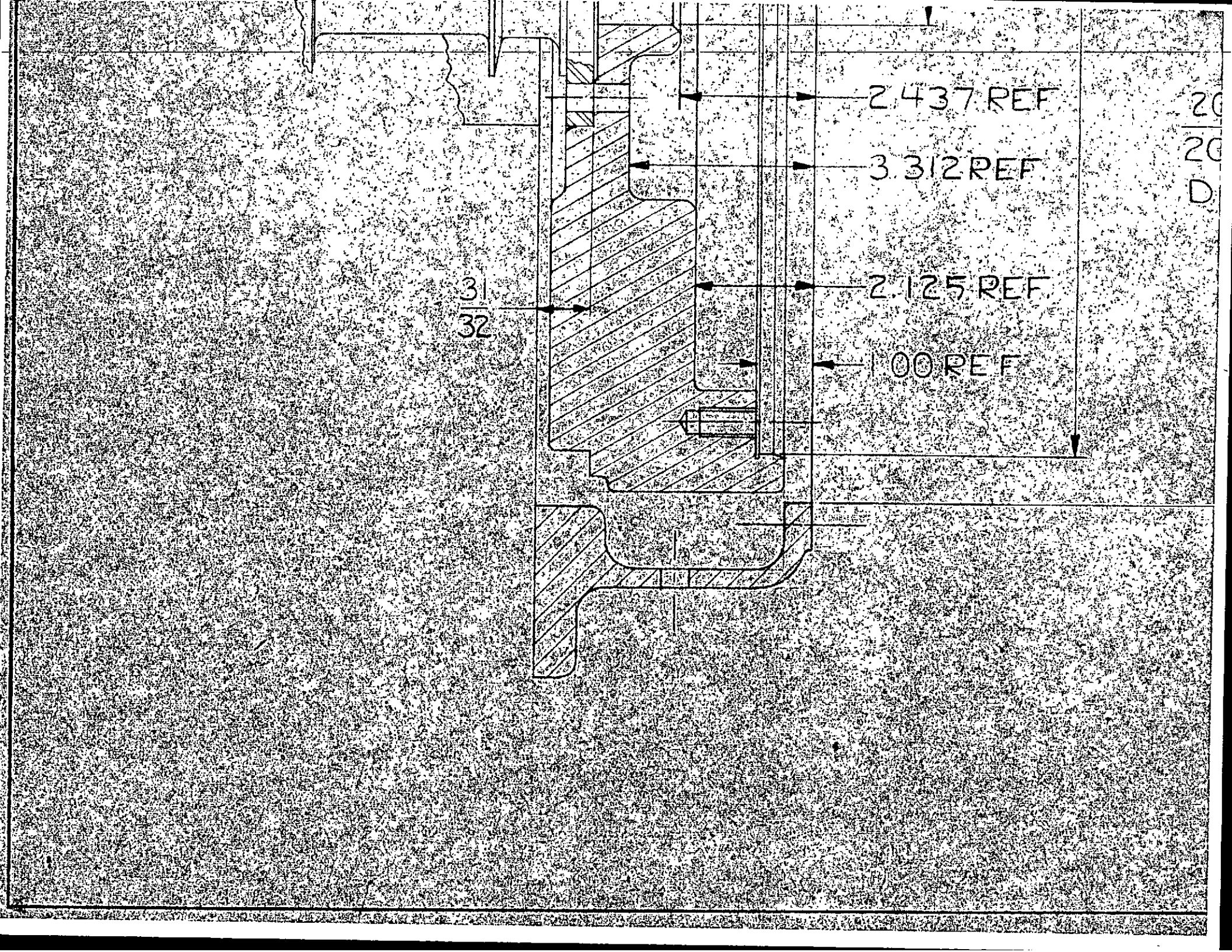
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