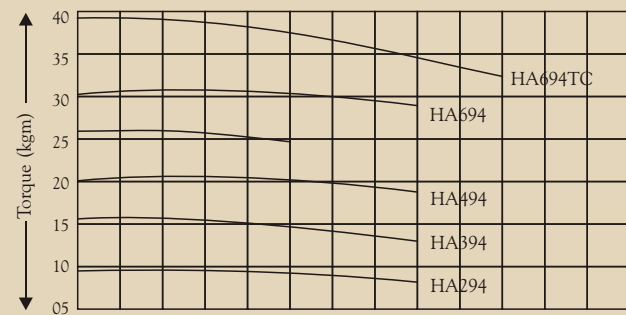


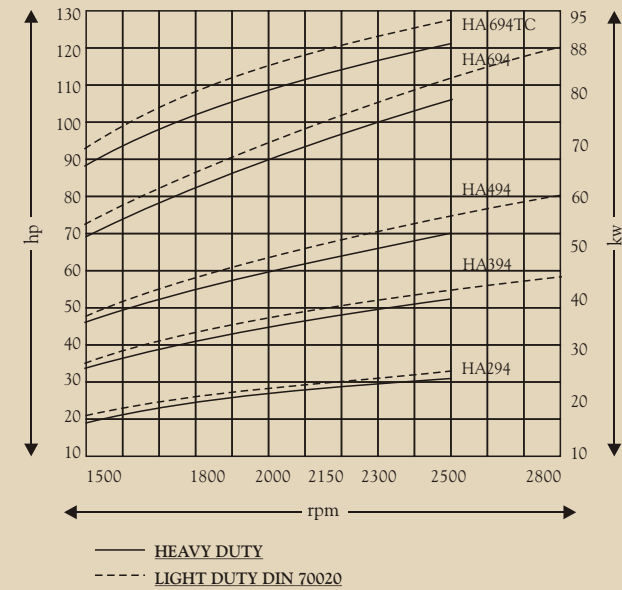
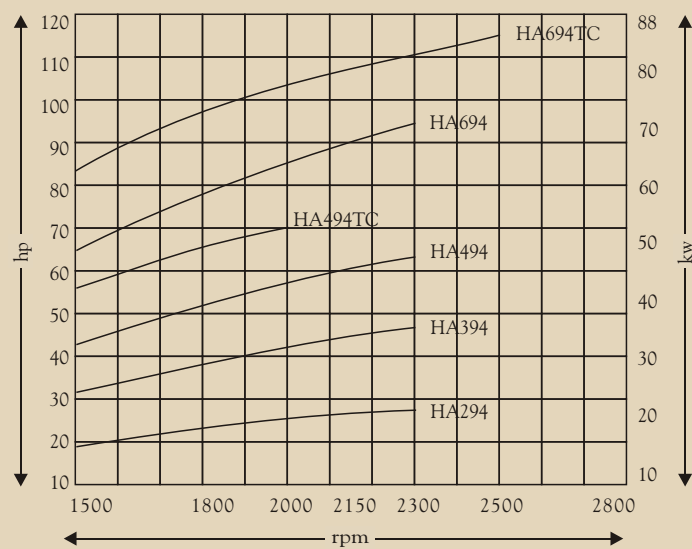
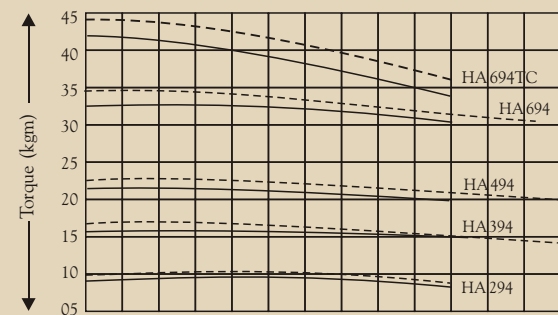


Enriching Lives

HORSE POWER RATINGS
AS PER IS: 10002/BS: 5514/DIN 6271/ISO: 3046
(ISO STD. POWER, CONTINUOUS RATING)



HORSE POWER RATINGS AS PER
IS:10002/BS: 5514/DIN 6271/ISO: 3046
ISO NET BRAKE FUEL STOP POWER (Max. Ratings)



— HEAVY DUTY
- - - LIGHT DUTY DIN 70020



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NOTE : As continuous developments are contemplated, the information and illustrations are subject to change and are not binding.
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HA SERIES

WELL THOUGHT - OUT ENGINES





Standard equipment

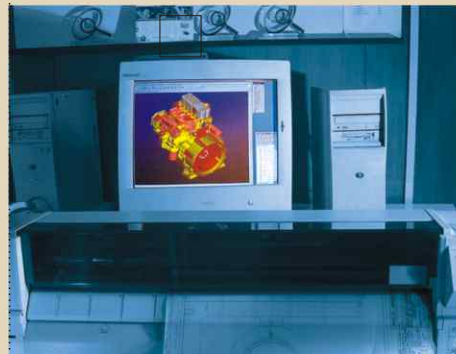
- Oil bath air cleaner with pre-cleaner and dust collector.
- Exhaust silencer.
- 12V electric starting with starter, without wiring, batteries and leads.
- 12V, 35 amps Alternator with built-in cut out.
- Engine control panel consisting of start push button, lube oil pressure gauge, ammeters and cut out.
- Pre and micro fuel filters.
- Lube oil cooler.
- Fuel lift pump.
- Lube oil filter.
- Engine stop lever. (hand operated)
- Belt guard (for Genset application engines only)
- Engine supports suitable for rigid mounting.
- Torsional vibration damper on crank pulley (for HA694/HA694TC engine only) as applicable.
- Automatic belt tension unit.
- Mechanical engine shut down system in case of 'V' belt failure.

Optional equipment

- Absorption type exhaust silencer suitable for remote mounting.
- Spark arrestor type exhaust silencer.
- Expansion bellow.
- Exhaust manifold-cum-silencer

for HA294/HA394/HA494/HA694 engine only (replaces separate manifold and exhaust silencer)

- Dry type air cleaner with evacuator valve and restriction indicator (pre-cleaner available on demand)
- Lock nut type speed adjusting unit on fuel pump.
- Engine supports suitable for anti-vibration mountings.
- Anti-vibration mountings.
- Hand starting arrangement at gear end on HA294, HA394 and HA494 only. (This



requires extra heavy flywheel which can be accommodated only in SAE-1, Flywheel Housing)

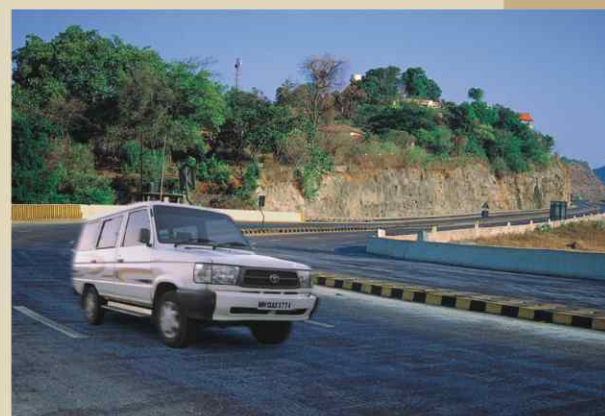
- Holset type flexible coupling with following unfinished bore flanges

Engine Model	Unfinished bore/ Coupling type
HA294/HA394	25mm(0.12RB)
HA494/HA494TC	25mm(0.12RB)
HA694	25mm(0.12RB)
HA694TC	25mm(0.2RB)

- Provision for gear driven hydraulic pump.
- Belt / gear driven compressor.
- Right angle or straight tachometer drive unit.
- Automatic engine shut-down arrangement in case of low lube oil pressure, high cylinder head temperature, V belt-failure and

engine over speed. (details on request)

- Industrial power take-offs (Twin disc type)*
- Hot air outlet ducting and fresh air intake ducting. (details on request)
- Raised oil filling and raised dipstick arrangement.
- Special lube oil sumps to suit high inclinations. (details on request)
- Flywheel housing (SAE4,3,2 and 1)
- 24V electrical starting system.
- Cold starting aid for engine starting below minus 5° C down to minus 20° C. (details on request)
- Mud filter and water separator Instruments.
 - Low lube oil pressure switch (normally open type)
 - V belt failure switch.
 - High cylinder head temperature switch.
 - Engine over speed switch (12V/24V).
 - 12V/24V stop solenoid (in lieu of mechanical shut down).
 - Tacho-hour meter with 1m/2m/3m long cable.
 - Electrical hour meter and tachometer.
 - Lube oil temperature gauge.



Horse power ratings: as per IS:10002/BS:5514/DIN 6271/ISO 3046
ISO STD: Power (Continuous Rating)

Engine	rpm	kW	bhp	ISO Net Brake Fuel Stop Power (Max Ratio)					
				Torque		Heavy Duty		Light Duty	
				KNm	Kgm	HP	Torque	HP	Torque
HA294	1500	14.0	19.0	0.089	9.1	20.0	9.55	21.0	10.00
	1800	16.9	23.0	0.090	9.2	24.5	9.75	25.5	10.15
	2000	18.4	25.0	0.087	9.0	26.5	9.50	28.0	10.00
	2150	19.5	26.5	0.086	8.9	28.0	9.35	29.5	9.85
	2300	20.2	27.5	0.084	8.6	29.0	9.00	30.5	9.50
2500	*	*	*	*	30.5	8.70	32.0	9.20	
HA394	1500	23.6	32.0	0.150	15.3	34.0	16.25	36.0	17.20
	1800	28.0	38.0	0.148	15.1	40.0	15.90	42.0	16.70
	2000	30.2	41.0	0.144	14.7	44.0	15.75	46.0	16.50
	2150	32.4	44.0	0.143	14.6	47.0	15.65	49.0	16.30
	2300	34.6	47.0	0.143	14.6	49.0	15.25	51.0	15.90
	2500	*	*	*	*	52.0	14.90	54.0	15.50
2800	*	*	*	*	*	*	58.0	14.80	
HA494	1500	31.6	43.0	0.201	20.5	46.0	22.00	48.0	22.90
	1800	38.2	52.0	0.203	20.7	54.0	21.50	58.0	23.00
	2000	41.2	56.0	0.196	20.0	60.0	21.50	63.0	22.50
	2150	44.2	60.0	0.196	20.0	63.0	21.00	67.0	22.30
	2300	46.4	63.0	0.192	19.6	66.0	20.56	70.0	21.80
	2500	*	*	*	*	70.0	20.10	74.0	21.20
2800	*	*	*	*	*	*	80.0	20.50	
HA494TC	1500	41.0	56.0	0.262	26.7	*	*	*	*
	1800	48.0	65.0	0.253	25.8	*	*	*	*
	2000	51.5	70.0	0.245	25.0	*	*	*	*
HA694	1500	47.8	65.0	0.304	31.0	69.0	32.90	73.0	34.80
	1800	57.4	78.0	0.304	31.0	82.0	32.60	87.0	34.60
	2000	62.6	85.0	0.298	30.4	90.0	32.20	95.0	34.00
	2150	66.2	90.0	0.294	30.0	95.0	31.60	100.0	33.30
	2300	69.9	95.0	0.290	29.6	100.0	31.15	106.0	33.00
	2500	*	*	*	*	106.0	30.40	112.0	32.10
2800	*	*	*	*	*	*	120.0	30.70	
HA694TC	1500	61.0	83.0	0.387	39.5	88.0	41.90	93.0	44.30
	1800	72.0	98.0	0.380	38.8	103.0	40.80	109.0	43.20
	2000	76.0	103.0	0.365	37.2	108.0	39.00	114.0	41.60
	2150	78.0	106.0	0.352	35.9	112.0	37.70	119.0	40.00
	2300	81.0	110.0	0.340	34.7	116.0	36.30	123.0	38.60
2500	84.5	115.0	0.324	33.0	121.0	34.70	128.0	36.70	

* Note: Selection depends on application, rpm and torque to be transmitted. Consult KOEL for proper selection.