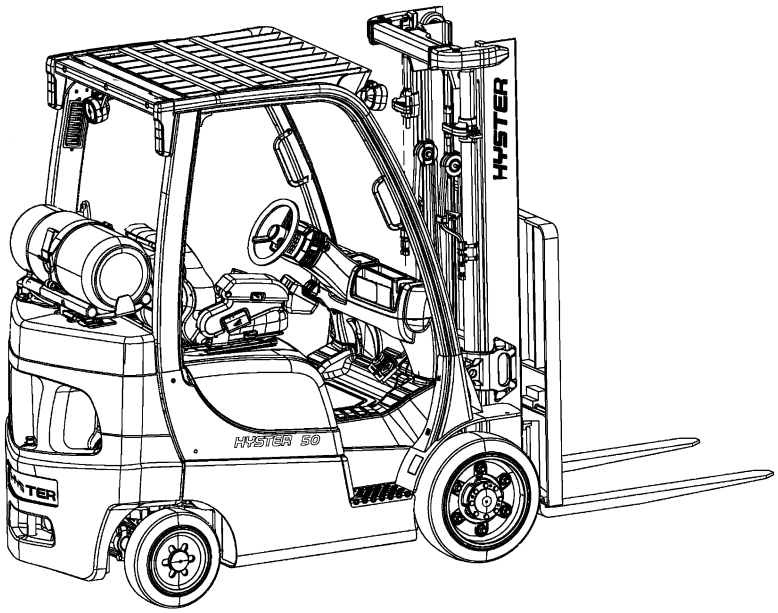
CAPACITIES AND SPECIFICATIONS

S2.0-3.5FT (S40-70FT, S55FTS) [F187]; H2.0-3.5FT (H40-70FT) [L177]



HYSTER

PART NO. 1580526

8000 SRM 1151

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This section is for the following models:

S2.0-3.5FT (S40-70FT, S55FTS) [F187];
H2.0-3.5FT (H40-70FT) [L177]

Lift Truck Lifting Capacity

Model	Weight
S2.0 (S40FT) (F187) H2.0 (H40FT) (L177)	1814 kg (4000 lb)
S2.5FT (S50FT) (F187) H2.5FT (H50FT) (L177)	2268 kg (5000 lb)
S55FTS (F187)	2495 kg (5500 lb)
S3.0FT (S60FT) (F187) H3.0FT (H60FT) (L177)	2722 kg (6000 lb)
S3.5FT (S70FT) (F187) H3.5FT (H70FT) (L177)	3175 kg (7000 lb)
NOTE: Load center at 500 mm (24 in.).	

Counterweight Weights

Model	Model
S2.0FT (S40FT) (F187)	1040 kg (2293 lb)
S2.5FT (S50FT) (F187)	1395 kg (3075 lb)
S55FTS (F187)	1643 kg (3622 lb)
S3.0FT (S60FT) (F187)	1819 kg (4010 lb)
S3.5FT (S70FT) (F187)	2153 kg (4747 lb)
H2.0FT (H40FT) (L177)	996 kg (2196 lb)
H2.5FT (H50FT) (L177)	1340 kg (2954 lb)
H3.0FT (H60FT) (L177)	1666 kg (3672 lb)
H3.5FT (H70FT) (L177)	1967 kg (4336 lb)

Tire Sizes

Truck	Drive Tires	Steer Tires
S2.0-2.5FT (S40-50FT) (F187)	21 × 7 × 15	16 × 5 × 10.5
S3.0FT (S55FTS-60FT) (F187)	21 × 8 × 15	16 × 6 × 10.5
S3.5FT (S70FT) (F187)	21 × 9 × 15	16 × 6 × 10.5
H2.0-2.5FT (H40-50FT) (L177)	7.00 x 12	6.00 x 9
H2.0-3.5FT (H40-70FT) (L177)	28 x 9	6.50 x 10

Capacities

Item	Quantity	Specifications
Fuel Capacity		
Gas S2.0-3.5FT (S40-70FT, S55FTS) (F187)	40.5 liter (10.7 gal)	86 Octane
Gas H2.0-3.5FT (H40-70FT) (L177)	52.0 liter (13.7 gal)	86 Octane
LPG S2.0-3.5FT (S40-70FT, S55FTS) (F187)	29.9 liter (7.9 gal) 15.2 kg (33.5 lb)	LPG-HD 5, HD 10
LPG H2.0-3.5FT (H40-70FT) (L177)	29.9 liter (7.9 gal) 15.2 kg (33.5 lb)	LPG-HD 5, HD 10
Diesel H2.0-3.5FT (H40-70FT) (L177) Trucks Only	52.0 liter (13.7 gal)	Diesel No. 2
Engine Oil (With Oil Filter)		
Mazda 2.0L	3.9 liter (4.1 qt)	−7°C (−20°F) and below SAE 5W-20 16°C (60 °F) and below SAE 5W-30 −18°C (0°F) and above SAE 10W-30 API SL ILSAC GF3 SAE J2362
Mazda 2.2L	4.2 liter (4.4 qt)	−7°C (−20°F) and below SAE 5W-20 16°C (60 °F) and below SAE 5W-30 −18°C (0°F) and above SAE 10W-30 API SL ILSAC GF3 SAE J2362
GM 2.4L	5.0 liter (5.3 qt)	−7°C (−20°F) and below SAE 5W-20 16°C (60 °F) and below SAE 5W-30 −18°C (0°F) and above SAE 10W-30 API SL ILSAC GF3 SAE J2362

(More Content includes: Brake system, Capacities, and specifications, Frame, Hydraulic, System, Industrial battery, Main control, Valve, Mast repair, Fasteners, Schematics diagrams, Steering axle, Steering system, Wire harness repair And more)

Item	Quantity	Specifications
Yanmar Diesel	10.2 liter (10.8 qt)	20°C (68°F) and over SAE 40 10 to 30°C (50 to 86°F) SAE 30 0 to 20°C (32 to 68°F) SAE 20 −16 to 40°C (3 to 104°F) SAE 15W-40 −20 to 30°C (−4 to 86°F) SAE 10W-30 −10 to 10°C (14 to 50°F) SAE 20W −20 to 10°C (−4 to 50°F) SAE 10W
Cooling System		
Mazda 2.0L and 2.2L Serpentine and Square Wave	11.0 liter (11.6 qt)	**CAUTION** **Additives may damage the cooling system. Before using additives, contact your local Hyster dealer.** 50% Water and 50% Ethylene Glycol, Boron-Free Antifreeze
Mazda 2.0L and 2.2L Square Wave with Air Oil Cooler	10.6 liter (11.2 qt)	**CAUTION** **Additives may damage the cooling system. Before using additives, contact your local Hyster dealer.** 50% Water and 50% Ethylene Glycol, Boron-Free Antifreeze
GM 2.4L	10.6 liter (11.2 qt)	**CAUTION** **Additives may damage the cooling system. Before using additives, contact your local Hyster dealer.** 50% Water and 50% Ethylene Glycol, Boron-Free Antifreeze

Item	Quantity	Specifications
Yanmar Diesel	11.5 liter (12.1 qt)	**CAUTION** **Additives may damage the cooling system. Before using additives, contact your local Hyster dealer.** 50% Water and 50% Ethylene Glycol, Boron-Free Antifreeze
Hydraulic Tank Oil Capacity		
S2.0-3.5FT (S40-70FT, S55FTS) (F187)	36.1 liter (38.1 qt) Initial Fill 30.1 liter (32.0 qt) Drain and Fill	**CAUTION** **Additives may damage the hydraulic system. Before using additives, contact your local Hyster dealer.** ISO VG-46 Hydraulic Oil −15°C (5°F) and above
H2.0-3.5FT (H40-70FT) (L177)	45.8 liter (48.4 qt) Initial Fill 39.8 liter (42.0 qt) Drain and Fill	**CAUTION** **Additives may damage the hydraulic system. Before using additives, contact your local Hyster dealer.** ISO VG-46 Hydraulic Oil −15°C (5°F) and above
Transmission		
Basic Powershift Transmission	20 liter (21.0 qt)	John Deere JDM J20C
DuraMatch™ Transmission	20 liter (21.0 qt)	John Deere JDM J20C
Brake Fluid (Dry Brake) Master Cylinder	0.25 liter (0.53 pt)	SAE J-1703, DOT 3
Brake Oil (Wet Brake) Master Cylinder	0.35 liter (0.74 pt)	Dexron III
Differential and Drive Axle Oil (Dry Brake) S2.0-3.5FT (S40-70FT, S55FTS (F187)	5.0 liter (5.3 qt)	SAE 80W-90 or 85W-140
Differential and Drive Axle Oil (Dry Brake) H2.0-3.5FT (H40-70FT) (L177)	6.5 liter (6.9 qt)	SAE 80W-90 or 85W-140

Item	Quantity	Specifications
Drive Axle (Wet Brake)		
Planetary Housing, Left Side H2.0-3.5FT (H40-70FT) (L177)	0.5 liter (0.5 qt)	John Deere JDM J20C
Differential Portion Of Drive Axle Center Section And Planetary Housing, Right Side H2.0-3.5FT (H40-70FT) (L177)	2.0 liter (2.1 qt)	John Deere JDM J20C
Wet Brake Portion Of Drive Axle Center Section H2.0-3.5FT (H40-70FT) (L177)	1.0 liter (1.1 qt)	John Deere JDM J20C

Electrical System

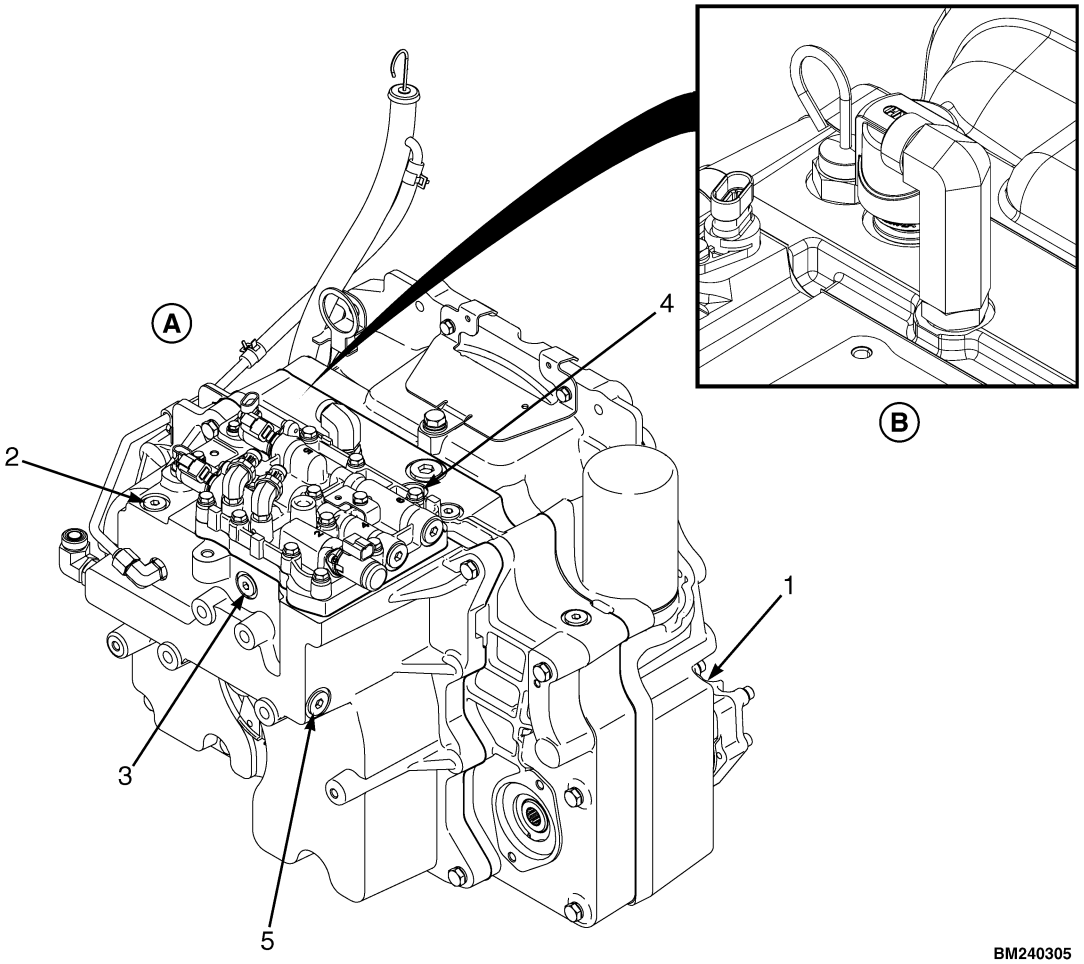
Item	Mazda 2.0L and 2.2L	GM 2.4L	Yanmar
Battery	12-volt, negative ground	12-volt, negative ground	12-volt, negative ground
Spark Plugs	ND W9EXR-U	NGK BPR6EY	N/A
Spark Plug Gap	0.8±1 mm (0.031±.0.04 in.)	0.8 to 0.9 mm (0.031 to 0.035 in.)	N/A
Ignition Timing:			
Gas	6° BTDC (Orange timing mark)	Not Adjustable	N/A
LPG	6° BTDC (Orange timing mark)	Not Adjustable	N/A
Diesel	N/A	N/A	2.6L engine preset @ 4° ATDC 3.3L engine preset @ 6° ATDC

Mazda 2.0L and 2.2L	
Alternator Output (14 Volts)	**G and LPG**
Idle	18 amps @ 800 rpm
High Idle	42 amps @ 2700 rpm
GM 2.4L	
Alternator Output (14 Volts)	**G and LPG**
Idle	38 amps @ 800 rpm
High Idle	65 amps @ 2700 rpm

Yanmar	
Alternator Output (13.5 Volts)	**D**
Idle	14 amps @ 825 rpm
High Idle (2.6L)	57 amps @ 2700 rpm
High Idle (3.3L)	56 amps @ 2600 rpm

Transmission Oil Pressures

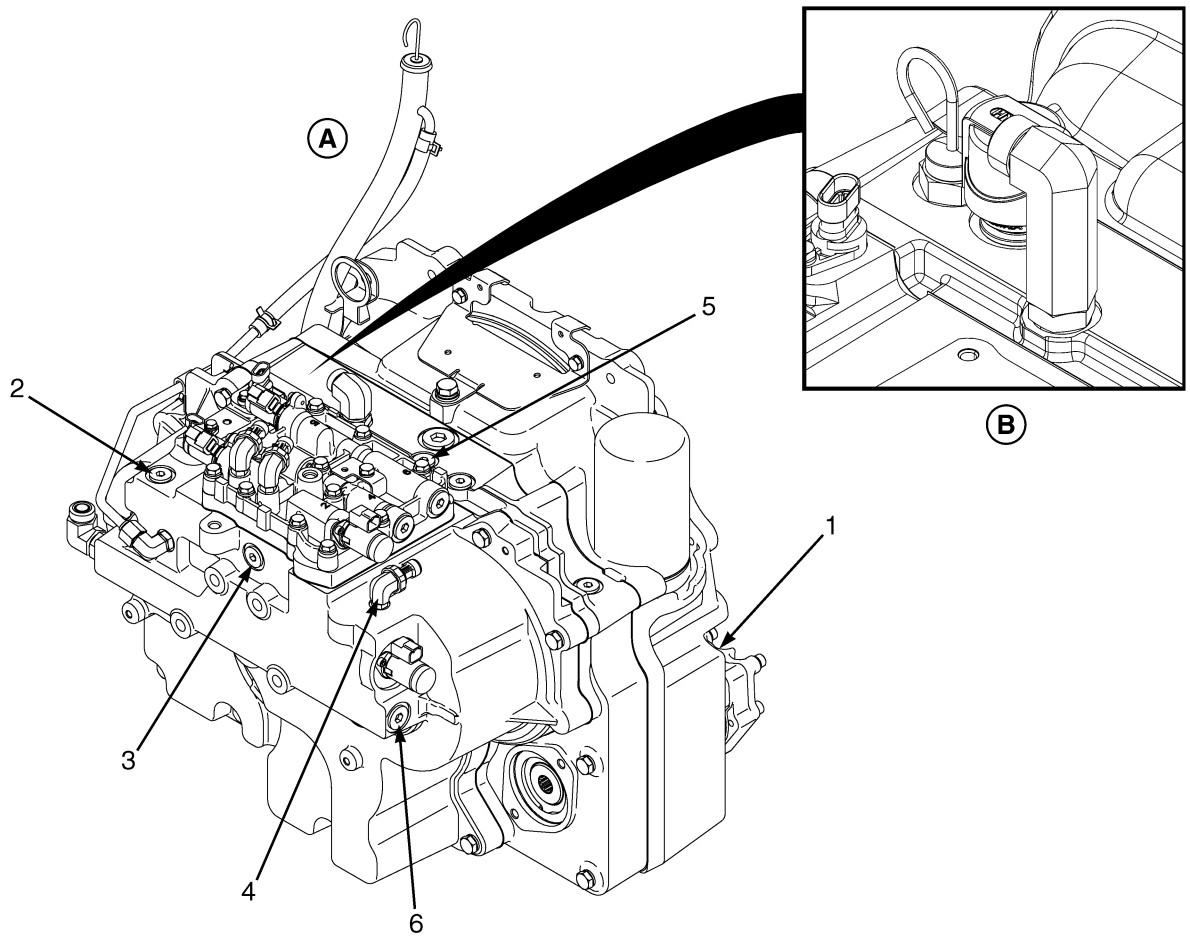
1-Speed Transmission All Pressures at 2000 rpm and Oil at 50 to 65°C (120 to 150°F)					
Port 1 Transmission Pump		Port 2	Port 3	Port 4	Port 5
***Low Pressure	***High Pressure	Reverse Clutch	Forward Clutch	Torque Converter	Lubrication
1138 ±96* kPa (165 ±14 psi)	1482 ±96* kPa (215 ±15 psi)	983 ±58** kPa (142.5 ±8.5 psi)	983 ±58** kPa (142.5 ±8.5 psi)	738 ±52 kPa (107 ±7.5 psi)	138 ±34.5 kPa (20 ±5 psi)



A. EARLY MODELS
B. LATER MODELS

*Relief Pressure
**Clutch pack pressure difference between the forward and reverse packs cannot exceed manufacturing limit of 48 kPa (7 psi) or service limit of 70 kPa (10 psi).
***High pressure port is used when the lift truck is equipped with a wet brake system. The low pressure port is used when the lift truck is equipped with a dry brake system.

2-Speed Transmission All Pressures at 2000 rpm and Oil at 50 to 65°C (120 to 150°F)						
Port 1 Transmission Pump		**Port 2**	**Port 3**	**Port 4**	**Port 5**	**Port 6**
***Low Pressure	***High Pressure	Reverse Clutch	Forward Low Clutch	Forward High Clutch	Torque Converter	Lubrication
1138 ±96* kPa (165 ±14 psi)	1482 ±96* kPa (215 ±15 psi)	983 ±58** kPa (142.5 ±8.5 psi)	983 ±58** kPa (142.5 ±8.5 psi)	983 ±58** kPa (142.5 ±8.5 psi)	738 ±52 kPa (107 ±7.5 psi)	138 ±34.5 kPa (20 ±5 psi)



A. EARLY MODELS
B. LATER MODELS

*Relief Pressure
**Clutch pack pressure difference between the forward and reverse packs cannot exceed manufacturing limit of 48 kPa (7 psi) or service limit of 70 kPa (10 psi).
***High pressure port is used when the lift truck is equipped with a wet brake system. The low pressure port is used when the lift truck is equipped with a dry brake system.

Hydraulic System Relief Pressures

Item	Specification
Oil Temperature	50 to 65°C (122 to 149°F)
Primary Relief Valve Pressure (High Idle)	
S2.0-3.0FT (S40-60FT, S55FTS) (F187) and H2.0-3.0FT (H40-60FT) (L177)	21.37 ±0.48 MPa (3099 ±70 psi)
S3.5FT (S70FT) (F187) and H3.5FT (H70FT) (L177)	23.44 ±0.48 MPa (3400 ±70 psi)
Secondary Relief Valve Pressure (High (Idle)	15.51 ±0.48 MPa (2250 ±70 psi)

Steering System

Item	Quantity	
Oil Temperature	50 to 65°C (122 to 149°F)	
Steering Relief Pressure at 800 rpms		
S2.0-3.0FT (S40-60FT, S55FTS) (F187) and H2.0-3.0FT (H40-60FT) (L177)	11.0 ±0.3 MPa (1595 ±43.5 psi)	
S3.5FT (S70FT) (F187) and H3.5FT (H70FT) (L177)	12.0 ±0.3 MPa (1740 ±43.5 psi)	
Steering Cylinder Stroke		
S2.0-3.5FT (S40-70FT, S55FTS) (F187) H2.0-3.5FT (H40-70FT) (L177)	170.3 mm (6.70 in.) 161.6 mm (6.4 in.)	
Inside Steering Tire Angle	82°	
Number of Turns to Lock		
S2.0-3.5FT (S40-70FT, S55FTS) (F187) H2.0-3.5FT (H40-70FT) (L177)	3.8 3.7	
Turning Radius (±50 mm NO LOAD)	**Outside**	**Inside**
Cushion Tire Trucks		
S2.0FT (S40FT) (F187)	1935	52
S2.5FT (S50FT) (F187)	2007	52
S55FTS (F187)	1935	33
S3.0FT (S60FT) (F187)	2075	33
S3.5FT (S70FT) (F187)	2105	8
Pneumatic Tire Trucks		
H2.0FT (H40FT) (L177)	2150	50
H2.5FT (H50FT) (L177)	2216	50
H3.0FT (H60FT) (L177)	2277	35
H3.5FT (H70FT) (L177)	2380	65

Stall Speeds (in RPM ±100 rpm)

MAZDA 2.0L (EXCEPT 2007 EMISSION COMPLIANT ENGINES)

Engine	New Engine	Broken-In Engine
Gas	2000	2106
LPG	1875	1974

MAZDA 2.0L (2007 EMISSION COMPLIANT ENGINES ONLY)

Engine	New Engine	Broken-In Engine
Gas	1875	1900
LPG	1820	1865

MAZDA 2.2L (EXCEPT 2007 EMISSION COMPLIANT ENGINES)

Engine	New Engine	Broken-In Engine
Gas	2073	2183
LPG	1995	2100

MAZDA 2.2L (2007 EMISSION COMPLIANT ENGINES ONLY)

Engine	New Engine	Broken-In Engine
Gas	1990	2010
LPG	2010	2050

GM 2.4L

Engine	New Engine	Broken-In Engine
Gas	1914	2015
LPG	1950	2053

YANMAR 2.6L

Engine	New Engine	Broken-In Engine*
Diesel	1752	1845
*30 or more hours.		

YANMAR 3.3L

Engine	New Engine	Broken-In Engine*
Diesel	2149	2263
*30 or more hours.		

Mast Speeds

NOTE: Lift speed is measured in meters/sec at governed engine RPM with full open valve and 65°C (149°F) oil temperature.

Lowering speed is measured in meters/sec with full open valve and 65°C (149°F) oil temperature.

Plus or minus 10% acceptable lifting or lowering.

Table 1. Lift Truck Models S2.0-3.5FT (S40-70FT, S55FTS) (F187)

Model/ Engine	Mast	Lowering M/Sec		Lifting M/Sec					
		No Load	Rated Load	No Load	S2.0FT (S40FT)	S2.5FT (S50FT)	S55FTS	S3.0FT (S60FT)	S3.5FT (S70FT)
S2.0-2.5FT (S40-55FT, S55FTS) Mazda 2.0L/2.2L	2-Stage LFL	0.44	0.55	0.60	0.55	0.55	0.55	N/A	N/A
	2-Stage FFL	0.37	0.55	0.60	0.49	0.49	0.49	N/A	N/A
	3-Stage FFL	0.37	0.55	0.60	0.52	0.52	0.52	N/A	N/A
	4-Stage FFL	0.37	0.55	0.60	0.51	0.51	N/A	N/A	N/A
S3.0-3.5FT (S60-70FT) Mazda 2.0L/2.2L	2-Stage LFL	0.44	0.55	0.60	N/A	N/A	N/A	0.55	0.55
	2-Stage FFL	0.37	0.55	0.60	N/A	N/A	N/A	0.53	0.53
	3-Stage FFL	0.37	0.55	0.60	N/A	N/A	N/A	0.58	0.58
	4-Stage FFL	0.37	0.55	0.60	N/A	N/A	N/A	N/A	N/A
S2.0-2.5FT (S40-55FT, S55FTS) GM 2.4L	2-Stage LFL	0.44	0.55	0.60	0.60	0.60	0.60	N/A	N/A
	2-Stage FFL	0.37	0.55	0.54	0.54	0.54	0.54	N/A	N/A
	3-Stage FFL	0.37	0.55	0.57	0.57	0.57	0.57	N/A	N/A
	4-Stage FFL	0.37	0.55	N/A	N/A	N/A	N/A	N/A	N/A

Table 1. Lift Truck Models S2.0-3.5FT (S40-70FT, S55FTS) (F187) (Continued)

Model/ Engine	Mast	Lowering M/Sec		Lifting M/Sec					
		No Load	Rated Load	No Load	S2.0FT (S40FT)	S2.5FT (S50FT)	S55FTS	S3.0FT (S60FT)	S3.5FT (S70FT)
S3.0-3.5FT (S60-70FT) GM 2.4L	2-Stage LFL	0.44	0.55	0.53	N/A	N/A	N/A	0.53	(Gas) 0.48 (LPG) 0.53
	2-Stage FFL	0.37	0.55	0.52	N/A	N/A	N/A	0.52	(Gas) 0.47 (LPG) 0.52
	3-Stage FFL	0.37	0.55	0.56	N/A	N/A	N/A	0.56	(Gas) 0.51 (LPG) 0.56

Table 2. Lift Truck Models H2.0-3.5FT (H40-70FT) (L177)

Model/ Engine	Mast	Lowering M/Sec		Lifting M/Sec				
		No Load	Rated Load	No Load	H2.0FT (H40FT)	H2.5FT (H50FT)	H3.0FT (H60FT)	H3.5FT (H70FT)
H2.0-2.5FT (H40-50FT) Mazda 2.0L	2-Stage LFL	0.42	0.50	0.57	0.57	0.57	N/A	N/A
	2-Stage FFL	0.42	0.50	0.51	0.51	0.51	N/A	N/A
	3-Stage FFL	0.42	0.50	0.54	0.54	0.54	N/A	N/A
H3.0-3.5FT (H60-70FT) Mazda 2.0L	2-Stage LFL	0.42	0.50	0.50	N/A	N/A	(Gas) 0.50 (LPG) 0.45	(Gas) 0.49 (LPG) 0.36
	2-Stage FFL	0.42	0.50	0.49	N/A	N/A	0.49	(Gas) 0.49 (LPG) 0.43
	3-Stage FFL	0.42	0.50	0.48	N/A	N/A	0.48	(Gas) 0.49 (LPG) 0.43

Table 2. Lift Truck Models H2.0-3.5FT (H40-70FT) (L177) (Continued)

Model/ Engine	Mast	Lowering M/Sec		Lifting M/Sec				
		No Load	Rated Load	No Load	H2.0FT (H40FT)	H2.5FT (H50FT)	H3.0FT (H60FT)	H3.5FT (H70FT)
H2.0-2.5FT (H40-50FT) Mazda 2.2L	2-Stage LFL	0.42	0.50	0.57	0.57	0.57	N/A	N/A
	2-Stage FFL	0.42	0.50	0.51	0.51	0.51	N/A	N/A
	3-Stage FFL	0.42	0.50	0.54	0.54	0.54	N/A	N/A
H3.0-3.5FT (H60-70FT) Mazda 2.2L	2-Stage LFL	0.42	0.50	0.50	N/A	N/A	0.50	0.50
	2-Stage FFL	0.42	0.50	0.49	N/A	N/A	0.49	0.49
	3-Stage FFL	0.42	0.50	0.48	N/A	N/A	0.48	0.48
H2.0-2.5FT (H40-50FT) GM 2.4L	2-Stage LFL	0.42	0.50	0.61	0.61	0.61	N/A	N/A
	2-Stage FFL	0.42	0.50	0.55	0.55	0.55	N/A	N/A
	3-Stage FFL	0.42	0.50	0.58	0.58	0.58	N/A	N/A
H3.0-3.5FT (H60-70FT) GM 2.4L	2-Stage LFL	0.42	0.50	0.54	N/A	N/A	0.54	0.54
	2-Stage FFL	0.42	0.50	0.53	N/A	N/A	0.53	0.53
	3-Stage FFL	0.42	0.50	0.52	N/A	N/A	0.52	0.52
H2.0-2.5FT (H40-50FT) Yanmar 2.6L	2-Stage LFL	0.42	0.50	0.69	0.67	0.63	N/A	N/A
	2-Stage FFL	0.42	0.50	0.62	0.61	0.58	N/A	N/A
	3-Stage FFL	0.42	0.50	0.66	0.63	0.59	N/A	N/A
H3.0-3.5FT (H60-70FT) Yanmar 2.6L	2-Stage LFL	0.42	0.50	0.57	N/A	N/A	0.54	0.39
	2-Stage FFL	0.42	0.50	0.56	N/A	N/A	0.53	0.40
	3-Stage FFL	0.42	0.50	0.54	N/A	N/A	0.52	0.39

Table 2. Lift Truck Models H2.0-3.5FT (H40-70FT) (L177) (Continued)

Model/ Engine	Mast	Lowering M/Sec		Lifting M/Sec				
		No Load	Rated Load	No Load	H2.0FT (H40FT)	H2.5FT (H50FT)	H3.0FT (H60FT)	H3.5FT (H70FT)
H2.0-2.5FT (H40-50FT) Yanmar 3.3L	2-Stage LFL	0.42	0.50	0.72	0.71	0.71	N/A	N/A
	2-Stage FFL	0.42	0.50	0.64	0.63	0.63	N/A	N/A
	3-Stage FFL	0.42	0.50	0.68	0.67	0.67	N/A	N/A
H3.0-3.5FT (H60-70FT) Yanmar 3.3L	2-Stage LFL	0.42	0.50	0.63	N/A	N/A	0.62	0.62
	2-Stage FFL	0.42	0.50	0.62	N/A	N/A	0.61	0.61
	3-Stage FFL	0.42	0.50	0.61	N/A	N/A	0.60	0.60

Tilt Angles

Truck should be on level ground and in unloaded condition.

Table 3. S2.0-3.5FT (S40-70FT, S55FTS) (F187) Lift Truck Models

Forward	Tolerance	Back	Tolerance
10°	+1°, −0.5°	5°	+0°, −0.5°
5°	+1°, −0.5°	8°	+0°, −0.5°
5°	+1°, −0.5°	5°	+0°, −0.5°
5°	+1°, −0.5°	4°	+0°, −0.5°
8°	+1°, −0.5°	5°	+0°, −0.5°

Table 4. H2.0-3.5FT (H40-70FT) (L177) Lift Truck Models

Forward	Tolerance	Back	Tolerance
10°	+1°, −0.5°	6°	+0°, −0.5°
6°	+1°, −0.5°	10°	+0°, −0.5°
6°	+1°, −0.5°	6°	+0°, −0.5°
6°	+1°, −0.5°	5°	+0°, −0.5°

Front End Equipment - Mast Creep

MAST CREEP

Measure with load at 2.5 m (8.0 ft) high and with the lift, tilt, and auxiliary control levers in neutral position.

NOTE: Mast should be 90° vertical prior to test.

Table 5. S2.0-3.5FT (S40-70FT, S55FTS) (F187) Lift Truck Models

Hydraulic Oil Temperature		Maximum Vertical Creep at Carriage		Maximum Tilt Creep		
				Mast Angle	Cylinder Stroke	
°C	°F	mm/Min	in./Min	°/Min	mm/Min	in./Min
20	68	2.2	0.086	0.10	0.88	0.035
30	86	3.3	0.130	0.15	1.32	0.05
40	104	6.3	0.247	0.29	2.56	0.10
50	122	10.0	0.394	0.47	4.14	0.16
60	140	14.6	0.575	0.68	5.99	0.24

Table 6. H2.0-3.5FT (H40-70FT) (L177) Lift Truck Models

Hydraulic Oil Temperature		Maximum Vertical Creep at Carriage		Maximum Tilt Creep		
				Mast Angle	Cylinder Stroke	
°C	°F	mm/Min	in./Min	°/Min	mm/Min	in./Min
20	68	2.2	0.086	0.10	0.93	0.037
30	86	3.3	0.130	0.15	1.40	0.06
40	104	6.3	0.247	0.29	2.70	0.11
50	122	10.0	0.394	0.47	4.37	0.17
60	140	14.6	0.575	0.68	6.32	0.25

Engine Specifications

Item	Mazda 2.0L	Mazda 2.2L	GM 2.4L
No. of Cylinders	4	4	4
Firing Order	1-3-4-2	1-3-4-2	1-3-4-2
Bore and Stroke	86 mm × 86 mm (3.39 in. × 3.39 in.)	86 mm × 94 mm (3.39 in. × 3.70 in.)	87.5 mm × 100 mm (3.44 in. × 3.94 in.)
Displacement	1998cc	2184cc	2400cc
Engine Timing	6° BTDC Gas/LPG	6° BTDC Gas/LPG	Timing is controlled by the Electronic Control Module (ECM)
Compression Ratio			
EGI (Gas)	8.6:1	8.6:1	9.53:1
LPG	9.3:1	10.1:1	9.53:1
Compression Pressure (Minimum Values)			
EGI (Gas)	1131 kPa (164 psi) @ 270 rpm	1131 kPa (164 psi) @ 270 rpm	N/A
LPG	1131 kPa (164 psi) @ 270 rpm	1131 kPa (164 psi) @ 270 rpm	N/A
Horsepower/rpm			
Gas	46/2600	50/2600	51/2600
LPG	40.6/2600	46.5/2600	61/2600
Oil Pressure	226 to 362 kPa (33 to 53 psi) @ 2400 rpm	226 to 362 kPa (33 to 53 psi) @ 2400 rpm	120 ±30 kPa (17.4 ±4.4 psi) @ 800 80°C (176°F) 268 ±30 kPa (39 ±4.4 psi) @ 2700 rpm 80°C (176°F)
Valve Clearance			
Intake	0.15 mm (0.006 in.) (COLD)	0.15 mm (0.006 in.) (COLD)	Not Adjustable
Exhaust	0.35 mm (0.014 in.) (COLD)	0.35 mm (0.014 in.) (COLD)	Not Adjustable
Idle Speed - Gas	800 ±25 rpm	800 ±25 rpm	800 ±25 rpm
Idle Speed - LPG	800 ±25 rpm	800 ±25 rpm	800 ±25 rpm
Governed Speed High Idle (No Load)	2700 ±25 rpm	2700 ± 25 rpm	2700 ±25 rpm
Thermostat Range			
START TO OPEN	82 ±1.5°C (180 ±35°F)	82 ±1.5°C (180 ±35°F)	82 ±1.5°C (180 ±35°F)
FULL OPEN	95 ±1.5°C (203 ±35°F)	95 ±1.5°C (203 ±35°F)	97 ±1.5°C (207 ±35°F)
Cooling System Pressure	103 kPa (15 psi)	103 kPa (15 psi)	103 kPa (15 psi)

Item	Yanmar 2.6L Diesel (4TNE92-NMH)	Yanmar 3.3L Diesel (4TNE98-NMH)
No. of Cylinders	4	4
Firing Order	1-3-4-2	1-3-4-2
Bore and Stroke	92 mm × 100 mm (3.62 in. × 3.94 in.)	98 mm × 110 mm (3.86 in. × 4.33 in.)
Displacement	2659 cc	3319 cc
Compression Ratio	21.5:1	21.5:1
Compression Pressure (Minimum Values)	2840 to 3040 kPa (412 to 441 psi) @ 250 rpm Limit: 2350 kPa (341 psi) @ 250 rpm	2840 to 3040 kPa (412 to 441 psi) @ 250 rpm Limit: 2350 kPa (341 psi) @ 250 rpm
Horsepower/rpm	45.1 @ 2450 rpm	63.6 @ 2400 rpm
Oil Pressure @ 80°C (176°F)	No Less than 58.6 kPa (8.5 psi) @ 850 rpm	No Less than 58.6 kPa (8.5 psi) @ 850 rpm
Valve Clearance		
Intake	0.20 ±0.05 mm (0.008 ±0.002 in.) (COLD)	0.20 ±0.05 mm (0.008 ±0.002 in.) (COLD)
Exhaust	0.20 ±0.05 mm (0.008 ±0.002 in.) (COLD)	0.20 ±0.05 mm (0.008 ±0.002 in.) (COLD)
Idle Speed	825 ±25 rpm	825 ±25 rpm
Governed Speed High Idle (No Load)	2700 ±25 rpm	2600 ±25 rpm
Thermostat Range		
START TO OPEN	69 to 73°C (156 to 163°F)	69 to 73°C (156 to 163°F)
FULL OPEN	Above 85 ±2.0°C (185 ±36°F)	Above 85 ±2.0°C (185 ±36°F)
Cooling System Pressure	103 kPa (15 psi)	103 kPa (15 psi)

Torque Specifications

FRAME

Overhead Guard Mount Capscrews
66 N•m (49 lbf ft)

Operator Compartment Mount Capscrews
53 N•m (39 lbf ft)

Cowl-to-Overhead Guard Legs
66 N•m (49 lbf ft)

Counterweight Capscrews
555 N•m (409 lbf ft)

MAST

Mast Mounting Capscrews
Mast to Drive Axle 270 N•m (199 lbf ft)
Tilt/Cylinder Adjust 90 N•m (66 lbf ft)
Pivot Pin Retainer 38 N•m (28 lbf ft)

STEERING SYSTEM, CUSHIONED TIRE TRUCKS

Hub Nut (Slotted Nut)
68 N•m (50 lbf ft) initial
3 N•m (27 lbf in) final

Steering Axle Mounting Bolts and Nuts
90 N•m (66 lbf ft)

Bearing Cap Capscrew
44 N•m (32.5 lbf ft)

Tie Rod Nut
163 N•m (120 lbf ft)

Steering Cylinder
225 N•m (166 lbf ft)

Steering Control Unit Mounting Capscrews
45 to 55 N•m (33 to 41 lbf ft)

STEERING SYSTEM, PNEUMATIC TIRE TRUCKS

Hub Nut (Slotted Nut)
200 N•m (148 lbf ft) initial
15 N•m (133 lbf in)

Steering Axle Plate Lock Nut
88 N•m (65 lbf ft)

King Pin Lock Nut
90 N•m (66 lbf ft) initial
34 N•m (25 lbf ft)

Wheel Nuts
155 to 175 N•m (114 to 129 lbf ft)

Steering Control Unit Mounting Capscrews
45 to 55 N•m (33 to 41 lbf ft)

Steer Cylinder Mounting Bolts
225 N•m (166 lbf ft)

DRIVE AXLE (DRY BRAKE)

Wheel Nuts
Cushioned Tire Trucks 340 to 380 N•m (251 to 280 lbf ft)

Wheel Nuts
Pneumatic Tire Trucks 450 to 500 N•m (332 to 369 lbf ft)

Propeller Shaft Retention Bolts (U-Joint)
30 to 37 N•m (22 to 27 lbf ft)

Hanger Assembly to Frame
820 to 902 N•m (605 to 665 lbf ft)

Ring Gear Capscrews
152 to 167 N•m (112 to 123 lbf ft)

Pinion Nut, to Seat Bearing
530 to 645 N•m (391 to 476 lbf ft)

Pinion Nut, for Pre-Load
370 to 410 N•m (273 to 302 lbf ft)

Pinion Shaft
5.9 to 9.8 N•m (52.2 to 86.7 lbf in)

Pinion Cover Capscrews
19 to 23 N•m (168 to 204 lbf in)

Axle Shaft Capscrews
Cushioned Tire Trucks 90 to 99 N•m (66 to 73 lbf ft)
Pneumatic Tire Trucks 90 to 108 N•m (66 to 80 lbf ft)

Brake Assembly Mounting
255 to 306 N•m (188 to 225.7 lbf ft)

Drain Plug
50 to 55 N•m (37 to 41 lbf ft)

Bearing Cap Capscrews
225 to 270 N•m (166 to 199 lbf ft)

Drop Box Housing
19 to 23 N•m (168 to 204 lbf in)

Differential Cover Capscrews
19 to 23 N•m (168 to 204 lbf in)

Axle to Differential Housing
Cushioned Tire Trucks 90 to 99 N•m (66 to 73 lbf ft)
Pneumatic Tire Trucks 225 to 248 N•m (166 to 183 lbf ft)

Thrust Screw
Pneumatic Trucks Only 68 to 95 N•m (50 to 70 lbf ft)

Differential Carrier Halves Capscrews
125 to 145 N•m (92 to 107 lbf ft)

Brake Manifold to Center Section Housing Capscrews
19 to 21 N•m (14 to 15.5 lbf ft)

DRIVE AXLE (WET BRAKE)

Adjuster Ring Nut Retainer Capscrew
13 N•m (115 lbf in)

Bevel Gear Capscrews
120 N•m (88.5 lbf ft)

Bleeder Valve
10 N•m (88.5 lbf in)

Drain Plugs
40 N•m (29.5 lbf ft)

Drive Axle to Frame Mounting Capscrews
820 to 902 N•m (605 to 665 lbf ft)

Drive Shaft Capscrews
30 to 37 N•m (22 to 27 lbf ft)

Fill/Level Plugs
40 N•m (29.5 lbf ft)

Manifold Retaining Capscrews
19 to 22 N•m (14 to 16 lbf ft)

Parking Brake Flange Socket-Head Screws
60 N•m (44.25 lbf ft)

Self-Adjust Screws
10 N•m (88.5 lbf in)

Trumpet Arm Capscrews
85 N•m (62.7 lbf ft)

Transmission Isolator Bolt
225 to 250 N•m (166 to 184 lbf ft)

Wheel Hub Retaining Nut
400 N•m (295 lbf ft)

Wheel Hub Support Socket-Head Screws
85 N•m (62.7 lbf ft)

Wheel Nuts
610 to 678 N•m (450 to 500 lbf ft)

TRANSMISSION

Transmission Mounting Bracket Capscrews
66 to 73 N•m (49 to 54 lbf ft)

Transmission to Drive Axle Bolt
225 to 250 N•m (166 to 184 lbf ft)

Transmission Housing Bolts
38 N•m (28 lbf ft)

Drive Plate to Torque Converter Capscrews
55.6 N•m (41 lbf ft)

Chain Drive Assembly
38 N•m (41 lbf ft)

Torque Converter Housing Capscrews
38 N•m (41 lbf ft)

Transmission Pump Capscrews
19 N•m (168 lbf in)

Transmission Enable Valve Capscrews
3 to 4 N•m (27 to 35 lbf in)

Forward and Reverse Valves Capscrews
3 to 4 N•m (27 to 35 lbf in)

Control Valve Mounting Capscrews
13.3 N•m (118 lbf in) initial
19 N•m (168 lbf in) final

Torque Converter Housing Cover Plate
7.9 N•m (5.8 lbf ft)

Torque Converter Housing Cover
19 N•m (168 lbf ft)

Speed Sensor Capscrew
6.9 N•m (5 lbf ft)

Transmission Input/Output Shaft Speed Sensor Capscrew
6.9 N•m (5 lbf ft)

ENGINE - MAZDA 2.0L AND 2.2L

Cooling Fan
8 to 11 N•m (71 to 97 lbf in)

Isolator Lock Nut
150 N•m (111 lbf ft)

Engine Mount to Engine
55 N•m (41 lbf ft)

Flywheel
96 to 103 N•m (71 to 76 lbf ft)

Flywheel Housing Capscrews
114 to 136 N•m (84 to 100 lbf ft)

Engine Fan Capscrews
27 N•m (20 lbf ft)

Starter Mount to Engine Bolt
38 N•m (28 lbf ft)

Alternator Adjustment Bracket Bolt
16 to 23 N•m (12 to 17 lbf ft)

Camshaft Pulley Lock Bolt
48 to 66 N•m (35 to 49 lbf ft)

Connecting Rod Cap
66 to 70 N•m (49 to 52 lbf ft)

Crankshaft Pulley
12 to 17 N•m (9 to 13 lbf ft)

Camshaft Cap
18 to 27 N•m (13 to 20 lbf ft)

Front Housing
19 to 26 N•m (14 to 19 lbf ft)

Cylinder Head
81 to 88 N•m (60 to 65 lbf ft)
See the section Mazda Engine, 2.0L and 2.2L 600 SRM 1122 **for torque tightening sequence.**

Exhaust Manifold
22 to 29 N•m (16 to 21 lbf ft)

Intake Manifold
19 to 31 N•m (14 to 23 lbf ft)

Main Bearing Cap
84 to 90 N•m (62 to 66 lbf ft)

Oil Pan
8 to 12 N•m (70 to 95 lbf in)

Oil Pan Drain Plug
30 to 41 N•m (22 to 30 lbf ft)

Oil Pump
M8 Capscrews 19 to 26 N•m (14 to 19 lbf ft)
M10 Capscrews 38 to 53 N•m (28 to 39 lbf ft)

Rear Cover
8 to 12 N•m (70 to 95 lbf in)

Oil Strainer
8 to 12 N•m (70 to 95 lbf in)

Rocker Cover
6 to 8 N•m (52 to 70 lbf in)

Rocker Shaft Assembly
18 to 27 N•m (13 to 20 lbf ft)

Spark Plugs
15 to 23 N•m (11 to 16 lbf ft)

Thermostat Cover
19 to 26 N•m (14 to 19 lbf ft)

Timing Belt Cover
7 to 10 N•m (62 to 89 lbf in)

Timing Belt Tension Lock Bolt
38 to 52 N•m (28 to 39 lbf ft)

Water Pump
19 to 26 N•m (14 to 19 lbf ft)

Oil Pressure Switch
12 to 17 N•m (9 to 13 lbf ft)

Heat Gauge Unit
12 to 18 N•m (105 to 156 lbf in)

ENGINE - GM 2.4L

Camshaft Carrier/Cylinder Head Bolts
First Pass 25 N•m (18 lbf ft)
Second Pass - Additional 180 degrees
Final Pass - Additional 10 degrees
See the section GM Engine Repair, GM 2.4 Liter Engine 600 SRM 1121 **for torque tightening sequence.**

Camshaft Timing Pulley Bolt
40 to 50 N•m (30 to 37 lbf ft)

Camshaft Sensor Retaining Screws
10 N•m (88.5 lbf in)

Camshaft Retainer Capscrews
8 N•m (71 lbf in)

Crankshaft Main Bearing Cap Capscrews
First Pass 50 N•m (37 lbf ft)
Second Pass - Additional 45 degrees Final Pass - Additional 15 degrees

Crankshaft Timing Pulley Retaining Bolt
First Pass 130 N•m (96 lbf ft)
Final Pass - Additional 45 degrees

Crankshaft Pulley Bolt
135 N•m (99 lbf ft)

Crankshaft Sensor Capscrew
8 N•m (71 lbf in)

Coil Mounting Capscrews
10 N•m (88.5 lbf in)

Coil Mounting Bracket Attaching Nuts
38 N•m (28 lbf ft)

Exhaust Manifold to Head Nuts
18 to 22 N•m (13 to 16 lbf ft)

Exhaust Manifold Adapter to Exhaust Manifold
18 to 22 N•m (13 to 16 lbf ft)

Intake Manifold to Head Nuts
18 to 22 N•m (13 to 16 lbf ft)

Lift Bracket Bolt
20 N•m (15 lbf ft)

Lift Bracket Nut
20 N•m (15 lbf ft)

Oil Filter
10 N•m (89 lbf in)

Oil Filter Stud
38 N•m (28 lbf ft)

Oil Pump Safety Valve
37 N•m (27 lbf ft)

Oil Pan Capscrews
18 to 22 N•m (13 to 16 lbf ft)

Oil Pan Drain Plug
18 to 22 N•m (13 to 16 lbf ft)

Oil Pump Cover
6 N•m (53 lbf in)

Oil Pump to Engine Block
8 N•m (71 lbf in)

Oil Pump Suction Tube Capscrews
6 to 10 N•m (53 to 89 lbf in)

Oil Pump Suction Tube Bracket Capscrew
18 to 22 N•m (13 to 16 lbf ft)

Oil Pressure Sensor
20 N•m (15 lbf ft)

Torque Converter Housing
55 N•m (41 lbf ft)

Engine Fan Capscrews
26 N•m (19 lbf ft)

Flywheel Adapter Capscrews
52 N•m (38 lbf ft)

Flywheel Housing
M10 Capscrews 38 N•m (28 lbf ft)
M12 Capscrews 66 N•m (48.7 lbf ft)
(1.75 × 110 and 1.75 × 40)
Panel Nut 8 N•m (71 lbf in)

Isolator Lock Nut
150 N•m (111 lbf ft)

Engine Mounting Capscrews
Mounting Bracket 52 N•m (38 lbf ft)
Engine Cradle 320 N•m (236 lbf ft)

General Hardware
Torque Fittings to 25 N•m (18 lbf ft)
Torque 6 mm hardware to 10 N•m (89 lbf in)
Torque 8 mm hardware to 20 N•m (177 lbf in)
Torque 10 mm hardware to 38 N•m (28 lbf ft)
Torque 12 mm hardware to 66 N•m (49 lbf ft)

Starter (Back of Starter)
Engine Harness 6 N•m (52 lbf in)
Alternator Harness 10 N•m (89 lbf in)

Coolant Manifold
Drain and Shutoff Valve 10 N•m (89 lbf in)

Baffle Plate Capscrews
First Pass 20 to 24 N•m (15 to 17.6 lbf ft)
Final Pass - Additional 45 degrees

Piston Rod Bearing Cap Capscrews
First Pass 30 to 40 N•m (22 to 29.5 lbf ft)
Final Pass - Additional 40 to 45 degrees

Rocker Arm Cover Bolts
8 N•m (71 lbf in)

Spark Plugs
20 N•m (15 lbf ft)

Timing Belt Front Cover Bolts
6 N•m (53 lbf in)

Timing Belt Front Bracket Capscrews
25 N•m (18 lbf ft)

Timing Belt Rear Cover Bolts
6 N•m (53 lbf in)

Timing Belt Tensioner Bolt
20 N•m (15 lbf ft)

Thermostat Cover Capscrews
20 N•m (15 lbf ft)

Thermostat Housing Capscrews
11 N•m (97 lbf in)

Water Pump Bolts
20 to 30 N•m (15 to 22 lbf in)

Cooling System Hose Clamps
4 to 5 N•m (35 to 44 lbf in)

Fan Hub Bracket Bolts
52 N•m (38 lbf ft)

Alternator Bracket Bolts
38 N•m (28 lbf ft)

ENGINE - YANMAR 2.6L AND 3.3L DIESEL

Cylinder Head Bolt
First Pass 49 to 59 N•m (36 to 43 lbf ft)
Second Pass 103 to 113 N•m (76 to 83 lbf ft)
See the section Yanmar Diesel Engines, 2.6L and 3.3L 600 SRM 1205 **for torque tightening sequence.**

Connecting Rod Bolt
54 to 59 N•m (40 to 43 lbf ft)

Flywheel Set Bolt
155 N•m (114 lbf ft)

Bearing Cap Set Bolt
108 to 118 N•m (80 to 87 lbf ft)

Crankshaft Pulley Set Bolt
117.6 N•m (86.7 lbf ft)

Fuel Pump Drive Gear Set Nut
59 to 69 N•m (44 to 51 lbf ft)

Fuel Injectors
39 N•m (29 lbf ft)

Fuel Return Line Retaining Nuts
44 N•m (33 lbf ft)

Engine Mount to Engine
52 N•m (38 lbf ft)

Isolator Lock Nut
150 N•m (111 lbf ft)

Alternator Adjustment Bracket Bolt
26 N•m (230 lbf in)

Alternator Pivot Bolt
30 N•m (22 lbf ft)

Flywheel Adapter Capscrews
52 N•m (38 lbf ft)

Flywheel to Torque Converter Capscrew
155 N•m (114 lbf ft)

Torque Converter Housing
55 N•m (41 lbf ft)

Thermostat Cover Capscrews
23 to 28 N•m (17 to 21 lbf ft)

Engine Oil Drain Plug
20 to 24 N•m (177 to 212 lbf in)

Fuel Filter/Water Separator Retaining Ring
15 to 20 N•m (133 to 177 lbf in)