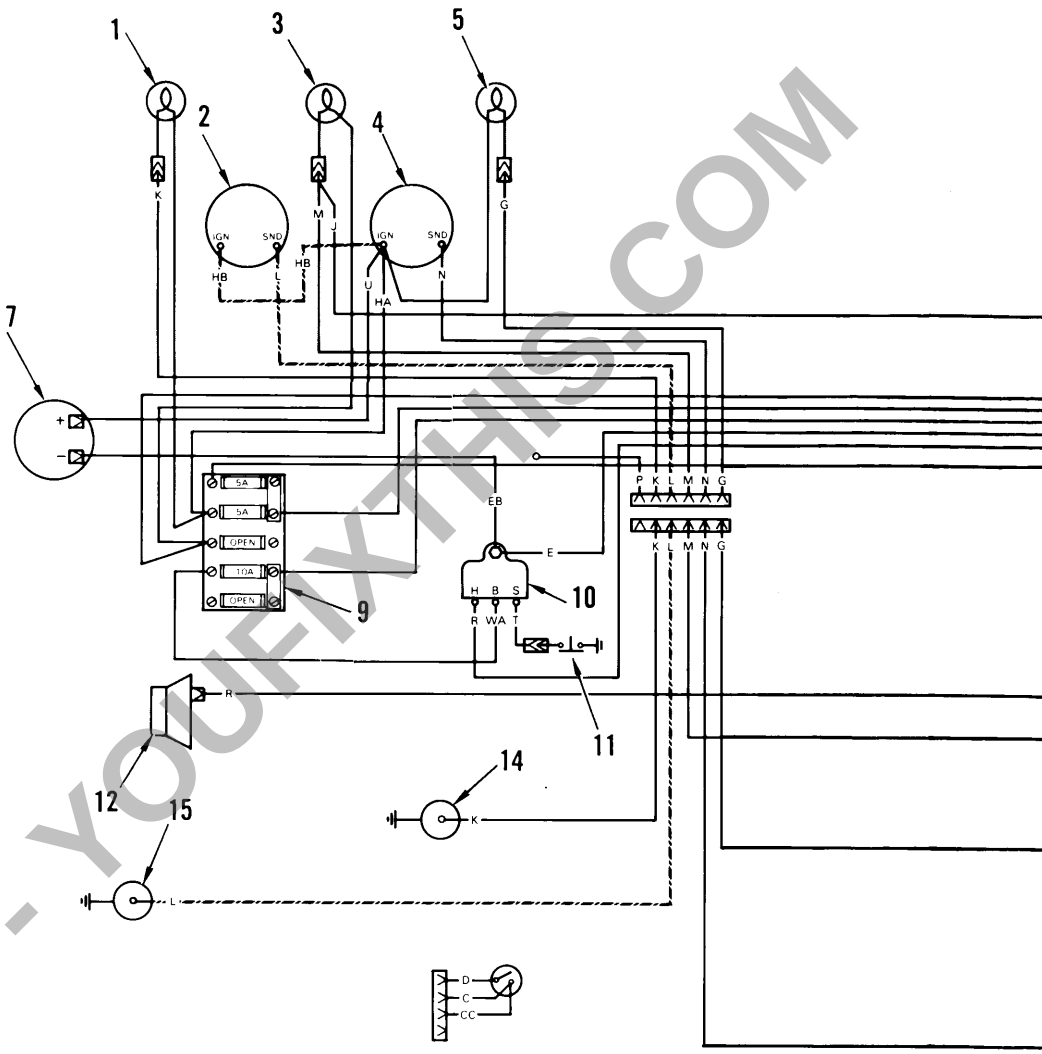
WIRE	COLOR	GAGE (AWG)
A	RED	12
B	GREEN	16
C	YELLOW	12
D	WHITE	12
E	BLACK	14
F	BROWN	16
G	ORANGE	16
H	BLUE	16
J	BLACK	16
K	RED	16
L	GREEN	16
M	YELLOW	16
N	WHITE	16
P	BLUE	12
R	YELLOW	16
S	GREEN	12
T	ORANGE	16
U	RED	16
V	ORANGE	16
W	BROWN	16
Y	RED	12
Z	YELLOW	12
AA	RED	12
EA	BLACK	14
EB	BLACK	14
EC	BLACK	14
HA	BLUE	16
HB	BLUE	16
SB	GREEN	12
SC	GREEN	12
WA	BROWN	16
AB	RED	12
BCC	RED	12
CD	BLACK	14
DA	WHITE	12
ED	BLACK	14
EE	BLUE	16
JJ	WHITE	12
HM	YELLOW	16
PM	BLACK	16
XM	RED	16
WX	YELLOW	12
LL	WHITE	12



DIRECTION CONTROL LEVER
NEUTRAL START SWITCH
DETAIL "A"

USED ON GASOLINE LIFT TRUCKS ONLY

1. LIGHT, ENGINE OIL PRESSURE
2. GAUGE, FUEL LEVEL
3. LIGHT, TRANSMISSION OIL TEMPERATURE
4. GAUGE, WATER TEMPERATURE
5. LIGHT, DISCHARGE INDICATOR
6. DISTRIBUTOR
7. HOURMETER
8. SPARK PLUGS
9. FUSE PANEL
10. HORN RELAY
11. HORN SWITCH
12. HORN
13. FUEL SHUT OFF

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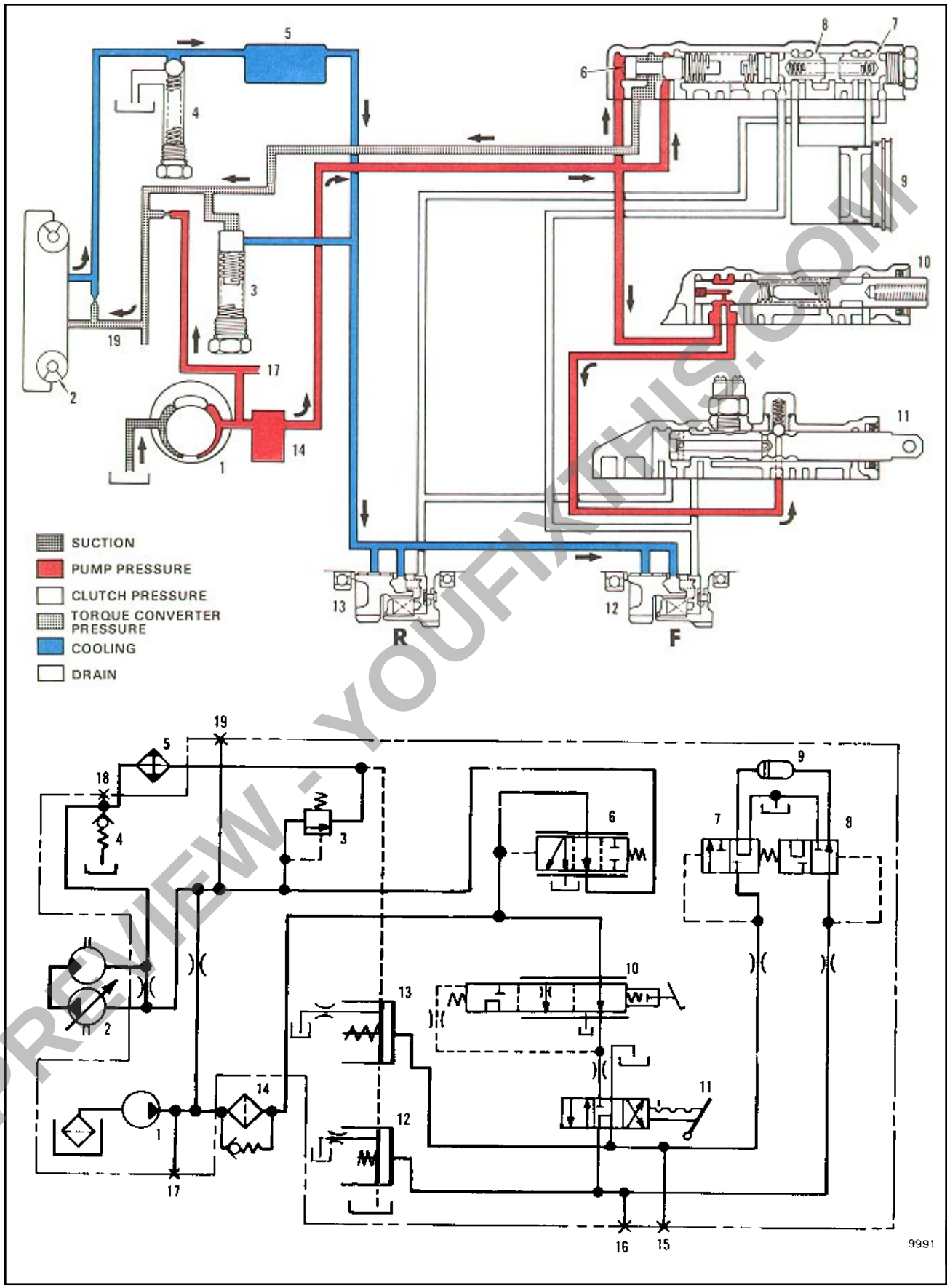


FIGURE 16. OIL FLOW IN NEUTRAL

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TORQUE SPECIFICATIONS

Cylinder Head	81 to 88 N.m (60 to 65 lbf ft)
Inlet manifold	30 to 51 N.m (22 to 38 lbf ft)
Exhaust manifold	30 to 51 N.m (22 to 38 lbf ft)
Main Bearing Cap	81 to 88 N.m (60 to 65 lbf ft)
Connecting Rod Cap	48 to 52 N.m (35 to 38 lbf ft)
Crankshaft Pulley	137 to 157 N.m (101 to 116 lbf ft)
Flywheel Housing	28 to 41 N.m (20 to 30 lbf ft)
Flywheel	58 to 64 N.m (43 to 47 lbf ft)
Camshaft Gear	118 to 137 N.m (87 to 101 lbf ft)
Camshaft Thrust Plate	16 to 23 N.m (12 to 17 lbf ft)
Cooling Fan	16 to 23 N.m (12 to 17 lbf ft)
Water Pump	16 to 23 N.m (12 to 17 lbf ft)
Rocker Arm Brackets	28 to 41 N.m (21 to 30 lbf ft)
Oil Sump	7 to 9 N.m (5 to 7 lbf ft)
Oil Pressure Switch	12 to 17 N.m (9 to 13 lbf ft)
Coolant Pump	16 to 23 N.m (12 to 17 lbf ft)
Alternator	13 to 20 N.m (18 to 27 lbf ft)
Starter	87 to 117 N.m (64 to 87 lbf ft)
Distributor	7 to 9 N.m (5 to 7 lbf ft)
Spark Plug	15 to 23 N.m (11 to 17 lbf ft)
Motor Mount to Engine	56 N.m (41 lbf ft)
Motor Mount to Frame	53 N.m (39 lbf ft)

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COUNTERWEIGHT

The counterweight is held in position on the frame by two hooks that are part of the frame. Two M20 x 2.5 capscrews hold the counterweight to the lower part of the frame.

⚠ WARNING

Do not operate the lift truck if the capscrews for the counterweight is not installed. When the capscrews are removed, the counterweight can fall from the lift truck.

Removal

1. If the lift truck has an LPG fuel system, remove the LPG tank and bracket so that the counterweight can be removed. Additional information on the LPG fuel system can be found in the following section of the **SERVICE MANUAL**:

THE LPG FUEL SYSTEM, 900 SRM 15.

⚠ WARNING

LPG can cause an explosion. Do not cause sparks or permit flammable material near the LPG system. LPG fuel systems can be disconnected indoors only if the lift truck is at least 8 metres (25 feet) from any open flame, motor vehicles, electrical equipment, or ignition source.

Close the fuel valve on the LPG tank before any part of the engine fuel system is disconnected. Run the engine until the fuel in the system is used and the engine stops.

If the engine will not run, close the fuel valve on the LPG tank. Loosen the fitting on the supply hose from the LPG tank where it enters the filter unit. Permit the pressure in the fuel system to decrease slowly. Fuel leaving the fitting removes heat. Use a cloth to protect your hands from the cold fitting.

2. Use the following procedure to remove the LPG tank**:**

a. Removable LPG tanks can be removed and replaced indoors only if the lift truck is at least 8 metres (25 feet) from any open flame or ignition source.

b. Move the lift truck to the area where tanks are changed.

c. Turn the tank fuel valve clockwise until the valve is completely closed.

d. Run the engine until it stops, then turn the key switch to the **OFF** position.

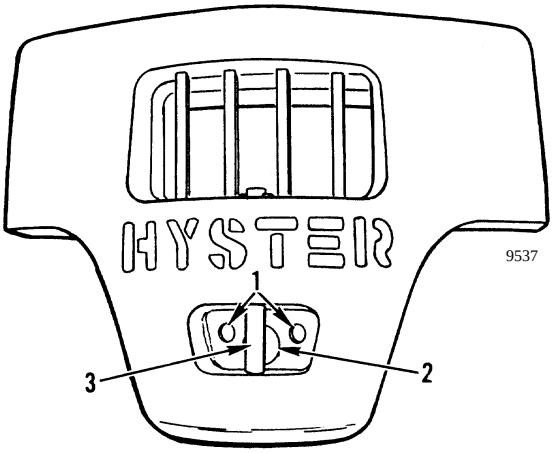
e. Disconnect the quick disconnect fitting.

f. Release the LPG tank latch and remove the tank from the bracket.

⚠ WARNING

The counterweight is heavy. Make sure that the crane and lifting devices have enough capacity to safely lift the weight. The counterweight castings have the following approximate weights:
H2.00XL (H40XL) 1100 kg (2425 lb)
H2.50XL (H50XL) 1450 kg (3190 lb)
H3.00XL (H60XL) 1815 kg (4000 lb)

3. See FIGURE 2. Install a lifting eye in the lifting hole of the counterweight. Connect a crane to the lifting eye and raise the crane until it holds part of the weight of the counterweight. Remove the two M20 x 2.5 capscrews that hold the counterweight to the frame. Use the crane to lift the counterweight from the lift truck.



1. COUNTERWEIGHT CAPSCREWS
2. HOLE FOR REMOVAL OF PIVOT SHAFT
3. TOW PIN

FIGURE 2. COUNTERWEIGHT

Installation

When the counterweight is installed, make sure the hooks on the frame fully engage the counterweight so that it is aligned with the parts of the frame. Tighten the two M20 x 2.5 capscrews to 320 N.m (235 lbf ft).

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TROUBLESHOOTING

PROBLEM	CAUSE
When the ignition switch is in the "START" position, the crankshaft does not operate.	The battery has a problem.
	The battery is not fully charged.
	The connections at the battery are loose or they have corrosion.
	The ignition switch is worn or damaged.
	The starter system has a problem.
	There is a seizure of parts in the engine.
The engine will not start.	The fuel tank is empty.
	The battery is not fully charged.
	The valves are damaged.
	The piston rings are worn or damaged.
	The ignition system has a problem.
	The fuel system is not operating.
	The ignition timing is not correct.
	The choke system does not work.
The engine does not run smoothly.	The valves are not adjusted correctly.
	The head gasket leaks.
	The cylinder head has cracks.
	There is a leak in the inlet system.
	The spark plugs have a problem.
	The ignition system has a problem. (See **THE ELECTRICAL SYSTEM, 2200 SRM 132** for more information.
The engine does not have enough power.	The air filter is dirty.
	The fuel is the wrong type.
	The ignition timing is not correct.
	The valve mechanism needs adjustment.
	The piston assemblies are damaged.
	The spark plugs are the wrong type or they are not installed correctly.
	The valve timing is not correct.
	The exhaust system has restrictions.

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adjust the clearance, loosen the lock nut and turn the adjustment screw.

NOTE: During adjustment of the valves, check the position of the balls that are in the ends of the rocker arms. The flat surface of the ball must be in contact with the stem of the valve. See FIGURE 8.

2. Rotate the crankshaft clockwise 180 degrees. Now adjust the valves for the number three cylinder.

3. Rotate the crankshaft clockwise 180 degrees. Now adjust the valves for the number four cylinder.

4. Rotate the crankshaft clockwise 180 degrees. Now adjust the valves for the number two cylinder.

5. If the valves are adjusted when the engine is cold, check the adjustments again after the engine is warm.

ADJUST THE THROTTLE LINKAGE

See **THE CARBURETOR, 900 SRM 129** for the adjustment of the throttle linkage

ENGINE SPECIFICATIONS

Engine Data

Type	4 – stroke, gasoline or LPG
Firing order	1–3–4–2
Displacement	1985 cm# (121.12 in#)
Bore	82 mm (3.22 in)
Stroke	94 mm (3.70 in)
(Lift trucks with serial codes A177 and A187) Compression ratio	8.0 : 1
(Lift trucks with serial codes A177 and A187) Compression pressure @ 200 rpm:	1075 kPa (156 psi)
(Lift trucks with serial codes B177, C177 and B187) Compression ratio	8.5 : 1
(Lift trucks with serial codes A177 and A187) Ignition timing	13° BTDC @ 625 rpm
(Lift trucks with serial codes B177, C177 and B187) Ignition timing	9° BTDC (gasoline) @ 625 rpm 18° BTDC (LPG) @ 625 rpm
(Governor speed	2600 to 2700 rpm [when installed in S/H1.25–1.75XL (S/H25–35XL) lift trucks]
(Governor speed	2700 to 2800 rpm [when installed in S2.00–3.00XL (S40–60XL) lift trucks]
(Governor speed	2900 to 3000 rpm [when installed in H2.00–3.00XL (H40–60XL) lift trucks]
Idle speed	600–650 rpm
Valve clearance adjustment (warm engine)	Inlet 0.30 mm (0.012 in) Exhaust 0.30 mm (0.012 in)

Cooling System

Thermostat	82°C (180°F)

Cylinder Head And Valve Mechanism

Maximum distortion of cylinder head. (See FIGURE 48.)	0.15 mm (0.006 in)

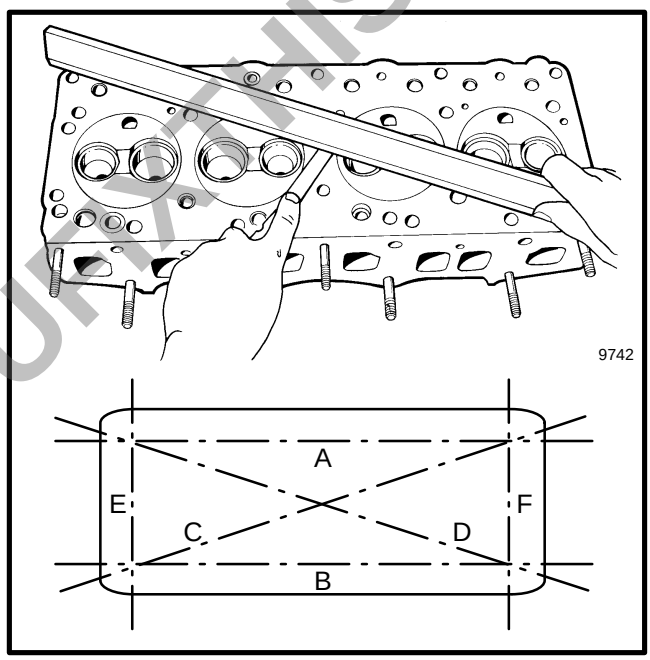
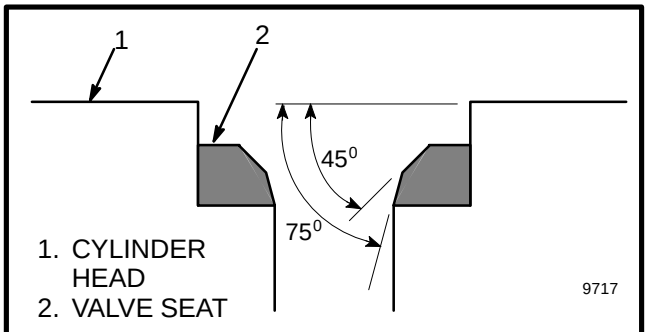


FIGURE 48. CHECK THE CYLINDER HEAD FOR DISTORTION

Valve seat specifications: See FIGURE 49.



NOTE: Inlet valves have 45° and 75° angles on the valve seats.
Exhaust valves only have a 45° on the valve seats.

FIGURE 49. VALVE SEAT SPECIFICATIONS

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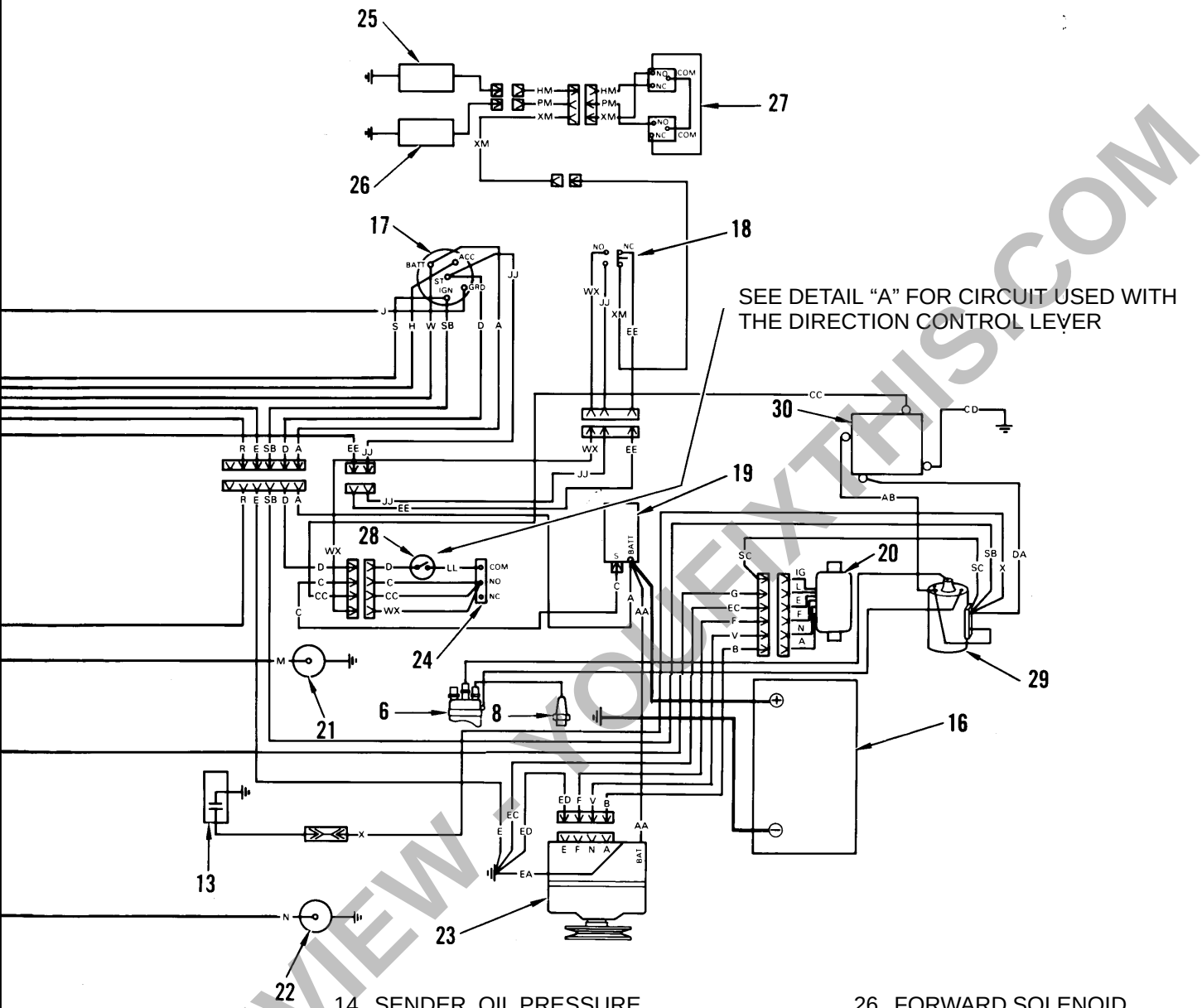
ITEM NO.	ITEM	8 Hr./ Daily	250 Hr./ 6 wk.	1000 Hr./ 6 mo.	2000 Hr./ 1 yr.	PROCEDURE OR QUANTITY	SPECIFICATION
1	ENGINE OIL Mazda 4–121G (Gasoline and LPG)	X	C			5.2 litre (5.5 qt)	API CC/SE/SF/SG, MIL–L–46152 30°C (85°F) and up SAE 30 15–30°C (60–85°F) SAE 30 0–15°C (32–60°F) SAE 20 less than –10°C (15°F) SAE 10W
1	ENGINE OIL GM 4–181 and GM 4–153 (Gasoline and LPG)	X	C			4.3 litre (4.5 qt)	API CC/SE/SF/SG, greater than –18°C (0°F) SAE 10W–30
1	ENGINE OIL Isuzu C240 (Diesel) Isuzu 4JB1 (Diesel)	X	C			5.2 litre (5.5 qt) 6.5 litre (6.9 qt)	API CC/SE/SF/SG, 27°C (80°F) and up SAE 40 0–32°C (32–90°F) SAE 30 less than –7°C (20°F) SAE 10W
2	DRIVE BELTS	X				Check Condition	See Parts Manual
	CHECK FOR LEAKS— FUEL, OIL, WATER	X				Check for Leaks	
3	COOLANT HOSES	X				Check Condition	See Parts Manual
4	COOLING SYSTEM S/H1.25–1.75XL (S/H25–35XL) Mazda 4–121G Isuzu C240 S2.00–3.00XL (S40–60XL) Mazda 4–121G GM 4–181 and GM 4–153 Isuzu C240 H2.00–3.00XL (H40–60XL) Mazda 4–121G GM 4–181 Isuzu C240 Isuzu 4JB1	X			C	 7.8 litre (8.2 qt) 8.1 litre (8.6 qt) 7.6 litre (8.0 qt) 11.4 litre (12.0 qt) 8.5 litre (9.0 qt) 11.1 litre (11.8 qt) 11.0 litre (11.7 qt) 11.4 litre (12.0 qt) 11.0 litre (11.7 qt)	 50% Water with 50% Ethylene Glycol
5	BATTERY ELECTROLYTE	X				Check Level	
6	FUEL FILTER, DIESEL	X		C		Clean or Replace See NOTE 1	See Parts Manual
7	FUEL TANK S/H1.25–1.75XL (S/H25–35XL) S2.00–3.00XL (S40–60XL) H2.00–3.00XL (H40–60XL)	X				 25.0 litre (6.5 gallon) 38.6 litre (10 gallon) 43.5 litre (11.5 gallon)	85 Octane — Gasoline Diesel No. 2 LPG — HD–5
8	AIR FILTER	X				Clean or Replace See NOTE 2	See Parts Manual
9	TRANSMISSION OIL S/H1.25–1.75XL (S/H25–35XL) S2.00–3.00XL (S40–60XL) H2.00–3.00XL (H40–60XL	X			C	 9.0 litre (9.5 qt) 10.4 litre (11 qt) 9.0 litre (9.5 qt)	Hyster Part No. 336831

X= Check C=Change L=Lubricate

NOTE 1: Check indicator light during operation (Lift trucks with serial codes B/C177 and B187 only).
NOTE 2: Very dirty conditions will require daily check and clean.

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14. SENDER, OIL PRESSURE
15. SENDER, FUEL GAUGE
16. BATTERY
17. KEY SWITCH
18. PARKING BRAKE SWITCH (MONOTROL)
19. STARTER
20. REGULATOR
21. SENDER, TRANSMISSION OIL TEMPERATURE
22. SENDER, WATER TEMPERATURE
23. ALTERNATOR
24. SWITCH, NEUTRAL START
25. REVERSE SOLENOID
26. FORWARD SOLENOID
27. MONOTROL PEDAL
28. SWITCH, SERVICE BRAKES
29. IGNITION COIL
30. RELAY

FIGURE 6. GASOLINE/LPG ENGINE WIRING DIAGRAM (G and LPG Rating)

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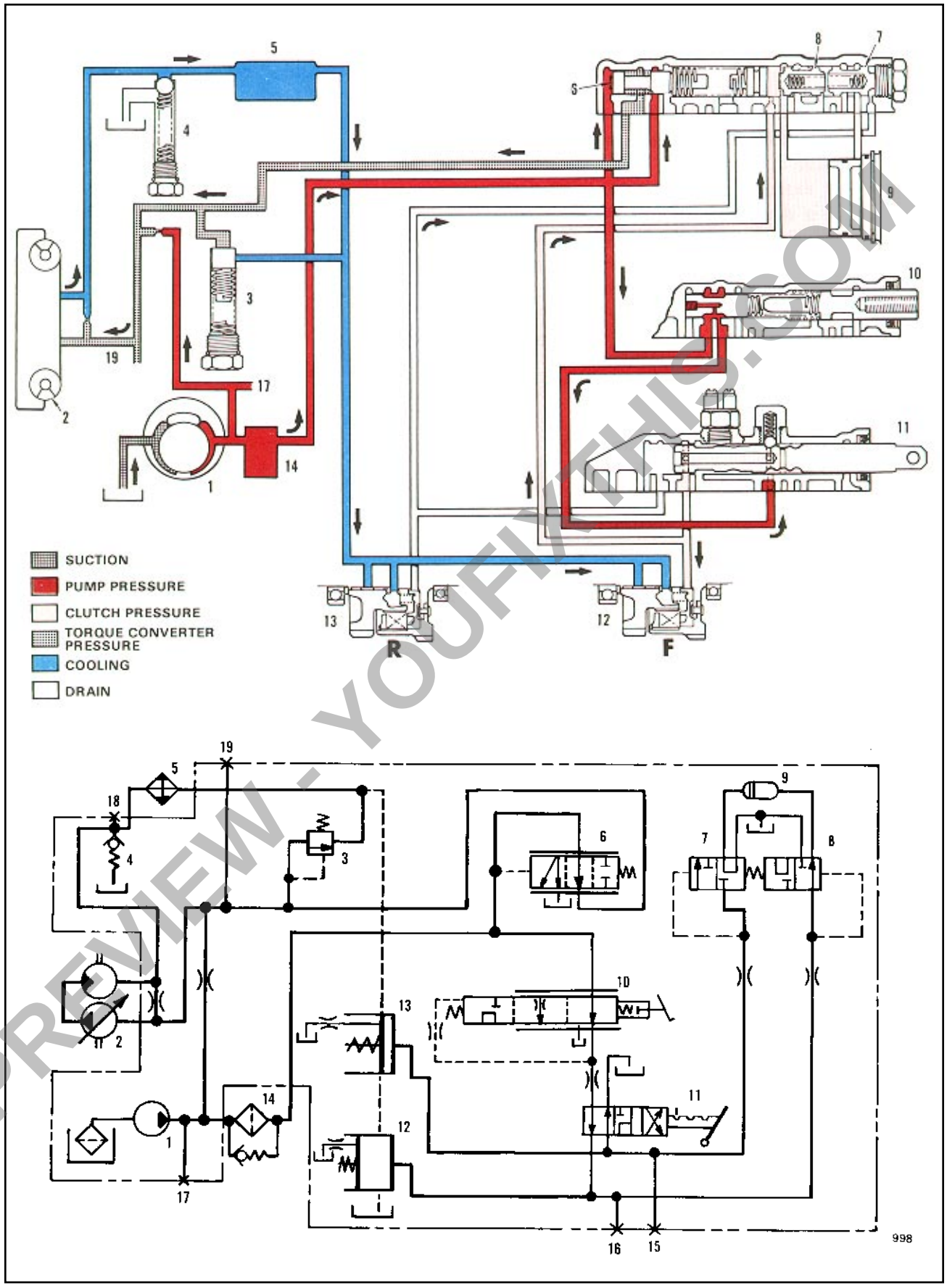


FIGURE 17. OIL FLOW IN FORWARD

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Connecting Rods

Clearance between bushing and piston pin
– Production limit 0.008 to 0.020 mm (0.0003 to 0.0008 in)
– Service limit 0.5 mm (0.0197 in)

Piston pin, outside diameter
– Production limit 26.995 to 27.000 mm (1.0628 to 1.0630 in)
– Service limit 26.97 mm (1.0618 in)

Cylinder Liners

Diameter
– Production 86.00 mm (3.3858 in)

Wear limit (measured 15 mm below top of cylinder liner) 86.20 mm (3.3937 in)

Cylinder Liners, Replacement*

If the cylinder bore diameter is
88.001 to 88.010 mm (3.4646 to 3.4650 in)
use Grade 1
Outside diameter 88.011 to 88.020 mm (3.4650 to 3.4653 in)

If the cylinder bore diameter is
88.011 to 88.020 mm (3.4650 to 3.4653 in)
use Grade 2
Outside diameter 88.021 to 88.030 mm (3.4654 to 3.4657 in)

If the cylinder bore diameter is
88.021 to 88.030 mm (3.4654 to 3.4657 in)
use Grade 3
Outside diameter 88.031 to 88.040 mm (3.4658 to 3.4661 in)

If the cylinder bore diameter is
88.031 to 88.040 mm (3.4658 to 3.4661 in)
use Grade 4
Outside diameter 88.041 to 88.050 mm (3.4662 to 3.4665 in)

Length 178 mm (7.12 in)

*See “Cylinder Block And Cylinder Liners” for additional information.

Lubrication System

Capacity with filter 5.2 liter (5.5 qt)

Oil pump, clearance between vane and rotor 0.02 to 0.13 mm (0.001 to 0.005 in)

Relief valve pressure 558 to 615 kPa (81 to 89 psi)

TORQUE SPECIFICATIONS

ITEM	SPECIFICATION
CAMSHAFT GEAR CAPSCREW	108 N.m (80 lbf ft)
CAMSHAFT THRUST PLATE CAPSCREW	19 N.m (14 lbf ft)
CRANKSHAFT PULLEY CAPSCREW	147 N.m (109 lbf ft)
CONNECTING ROD CAPSCREWS	78 N.m (58 lbf ft)
CYLINDER HEAD CAPSCREWS	78 N.m (58 lbf ft)
ENGINE MOUNT CAPSCREWS	
H2.00–3.20XM (H40–65XM), Right–Hand Side	55 N.m (41 lbf ft)
H2.00–3.20XM (H40–65XM), Left–Hand Side	40 N.m (30 lbf ft)
FLYWHEEL CAPSCREWS	
Units except H2.00–3.20XM (H40–65XM)	70 N.m (58 lbf ft)
H2.00–3.20XM (H40–65XM)	120 N.m (89 lbf ft)
IDLER GEAR CAPSCREW	26 N.m (19 lbf ft)
MAIN BEARING CAPSCREWS	160 N.m (120 lbf ft)
REAR OIL SEAL CAPSCREWS	49 N.m (36 lbf ft)
ROCKER ARM BRACKET NUTS	29 N.m (22 lbf ft)

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If the lift truck has an LPG fuel system, install the bracket for the LPG tank. Use the following procedure to install the LPG tank:

a. Before the LPG tank is installed on the lift truck, make sure the tank has fuel in it. Check the operation of the fuel gauge. Look at the fuel gauge and move the tank. If the gauge needle does not move, a new tank must be installed.

b. Put the tank in the tank bracket. Make sure that the tank is aligned with the alignment pin.

c. Close the latch.

d. Connect the quick disconnect fitting to the fuel valve on the tank. Use your hand to tighten the fitting. Do not open the fuel valve until the quick disconnect fitting is completely tightened. Turn the fuel valve counterclockwise to open the fuel valve.

e. Inspect the fuel system for leaks when the fuel valve is open. Frost on the surface of the tank, valves or fittings or a strong odor indicates leakage.

MUFFLER

The muffler is inside the counterweight and between the counterweight and the radiator. A short exhaust pipe sends the exhaust gases out of the lift truck through the grille in the counterweight.

The lift truck can have an overhead exhaust system. The exhaust pipe is fastened to the right rear leg of the overhead guard.

HOOD (See FIGURE 1.)

Removal

1. Raise the hood. Hold the hood so that it does not fall and disconnect the gas controlled spring at the hood.

2. Remove the capscrews that hold the hood hinges to the frame of the lift truck. Remove the hood.

Installation

1. Install the hood in position on the lift truck. Install the capscrews that hold the hood hinges to the frame. Connect the gas controlled spring to the hood. Adjust the position of the hood with the latch on the front cover. Tighten the capscrews for the hood hinges.

⚠ WARNING

The hood, hood latch and hood striker must be correctly adjusted for the correct operation of the operator restraint system.

2. See FIGURE 4. Use the following procedure to adjust the hood latch:

a. Install the floor plate and tighten the capscrews.

b. Install the latch striker in the highest slot position on the floor plate. Check that the latch striker is in the center of the jaws of the hood latch.

c. Close the hood to the fully closed position. The hood latch has two positions. The hood is fully closed after two clicks of the latch.

d. Loosen the capscrews for the latch striker just enough to let the striker move. Push the hood down until the hood just touches the rubber bumpers on the frame. Make sure the latch striker is still in the center of the hood latch. Tighten the capscrews for the striker.

e. Check the operation of the hood latch. Have an operator sit in the seat. Make sure that the hood is fully closed (two clicks). Also check that the hood touches the rubber bumpers. If additional adjustment is necessary, repeat Step d.

RADIATOR AND COOLANT SYSTEM

Removal

1. Drain the coolant from the radiator and the engine.

2. Remove the capscrews that hold the fan shroud to the radiator. Remove the four capscrews that fasten the fan to the hub and remove both the fan and the fan shroud.

3. Disconnect the coolant hoses at the radiator. Disconnect the lines to the oil cooler in the bottom of the radiator. Also disconnect these lines at the transmission housing. Put caps on the open lines and ports. Remove the two capscrews that still hold the radiator. Remove the radiator.

Installation

1. Install the radiator with the two capscrews that do not fasten the fan shroud. Connect the lines for transmission oil to the oil cooler in the radiator. Also connect these

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TROUBLESHOOTING

PROBLEM	CAUSE
There is noise inside the engine.	The main bearings are worn or damaged.
	The bearings for the connecting rods are worn or damaged.
	The pistons are worn or damaged.
	The engine is too hot.
	There is not enough oil in the engine.
	The flywheel is loose.
	A connecting rod is bent.
	There is a leak in the exhaust system.
	A cam follower has a problem.
	The valves are not adjusted correctly.
There is noise in the engine during acceleration.	The spark plugs are dirty.
	The spark plugs are the wrong type.
	The ignition timing is not correct.
	The fuel is the wrong type.
	There is too much carbon in the combustion chamber.
	The engine is too hot.
	The carburetor is not adjusted correctly.
The engine gets too hot.	There is not enough coolant in the cooling system.
	The belt for the water pump is worn or not adjusted correctly.
	The thermostat does not open correctly.
	The cooling system has restrictions.
	The water pump does not operate correctly
	The radiator is dirty.
	The exhaust system has restrictions.
The bearings in the engine are damaged.	There is not enough oil in the engine.
	The oil in the engine is the wrong type.
	The oil pump is worn or damaged.
	The connecting rod(s) are bent or damaged.
	The camshaft is damaged.
	The passages for oil have restrictions.
	The bearings are not installed correctly.
	The oil in the engine is dirty.

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LIFT TRUCK WEIGHTS*

Unit	Kilograms	Pounds
H2.00XL (H40XL)	3515	7750
H2.50XL (H50XL)	3855	8500
H3.00 (H60XL)	4315	9510

*Lift trucks equipped with overhead guard, mast, carriage, load backrest extension, forks, gasoline engine and operator.

H2,00–2.50XL (H40–50XL) with 3760 mm (148 in) two–stage mast.
H3.00XL (H60XL) with 3600 mm (142 in) two–stage mast.

ENGINE SPECIFICATIONS

Engine	Mazda M4–121G (A177, B177, C177)*	GM 4–181 (C177)*	Isuzu C240 (A177, B177, C177)*	Isuzu 4JB1 (C177)*
No. of Cylinders	4	4	4	4
Firing Order	1–3–4–2	1–3–4–2	1–3–4–2	1–3–4–2
Bore and Stroke	82 mm x 94 mm (3.23 in x3.70 in)	102 mm x 91 mm (4.00 in x 3.60 in)	86 mm x 102 mm (3.39 in x 4.02 in)	93 mm x 102 mm (3.67 in x 4.02 in)
Displacement	1985 cm^3 (121.1 in^3)	2966 cm^3 (181 in^3)	2369 cm^3 (144.5 in^3)	2771 cm^3 (169 in^3)
Compression Ratio	8.0:1 (A177) 8.6:1 (B177, C177)	8.0:1	20.0:1	18.2:1
Compression Pressure	1075 kPa (156 psi) @ 200 rom	758 kPa (110 psi) @ 200 rpm	3040 kPa (441 psi) @ 200 rpm	3040 kPa (441 psi) @ 200 rpm
Oil Pressure	450 kPa (65 psi) minimum @3000 rpm	138 kPa (20 psi) minimum @1200 rpm	390 kPa (57 psi) minimum @1000 rpm	294 kPa (43 psi) minimum @2000 rpm
Ignition Timing	13° BTDC @625 rpm	0° BTDC @500 rpm	Not Applicable	Not Applicable
Valve Clearance (Inlet and Exhaust)	0.3 mm (0.012 in) Hot	One turn down from zero clearance	0.45 mm (0.018 in) Cold	0.40 mm (0.016 in) Cold
Idle Speed	600 to 650 rpm	560 to 600 rpm	600 to 650 rpm	750 to 800 rpm
Governor Speed @ No Load	3000 to 3100 rpm	2700 to 2800 rpm	3000 to 3100 rpm	2250 to 2350 rpm
Stall Speed** Gasoline LPG	2000 to 2100 rpm 1950 to 2050 rpm	2150 to 2250 rpm 2100 to 2200 rpm	2050 to 2150 rpm (Diesel)	1955–2055 rpm (Diesel)
Thermostat Range	75 to 78°C (167 to 172°F)	82°C (180°F)	75 to 78°C (167 to 172°F)	75 to 78°C (167 to 172°F)
Cooling System Pressure	103 kPa (15 psi)	88 kPa (13 psi)	103 kPa (15 psi)	103 kPa (15 psi)
Fuel Injector Pressure	Not Applicable	Not Applicable	1195 MPa (1706 psi)	1814 MPa (2630 psi)
Fuel Injection Timing	Not Applicable	Not Applicable	14° BTDC Static	16° BTDC Static

*Lift truck serial number code

**Engines with 50 hours or more of operation

♦With initial timing connector disconnected

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ITEM NO.	ITEM	8 Hr./ Daily	250 Hr./ 6 wk.	1000 Hr./ 6 mo.	2000 Hr./ 1 yr.	PROCEDURE OR QUANTITY	SPECIFICATION
10	HYDRAULIC SYSTEM (TANK) S/H1.25–1.75XL (S/H25–35XL) S2.00–3.00XL (S40–60XL) H2.00–3.00XL (H40–60XL)	X			C	 18.9 litre (20 qt) 30.3 litre (32.0 qt) 31.8 litre (33.6 qt)	–18°C (0°F) and Above SAE 10W API CC or CC/SE/SF/SG
11	TIRES, TIRE PRESSURE	X				See Nameplate	
12	MAST, CARRIAGE, LIFT CHAINS	X				Check Condition	See Parts Manual
13	FORKS	X	X			Check Condition	
	SAFETY LABELS	X				Replace as Necessary	See Parts Manual
	SEAT BELT AND SEAT RAILS	X				Check Condition	
	HOOD AND SEAT LATCHES	X				Check Condition	
	HORN, GAUGES, LIGHTS, ALARMS	X				Check Operation	
14	SERVICE BRAKES AND PARKING BRAKE	X			X	Check Operation Check Condition	
	STEERING & POSITION LATCH	X				Check Operation	
15	TRANSMISSION	X				Check Operation	
16	BRAKE FLUID		X			0.2 litre (0.4 pt)	SAE J–1703
2	DRIVE BELTS		X			Adjust or Replace	See Parts Manual
	BRAKE, INCHING/BRAKE PEDALS		X			Adjust as Required	
1	ENGINE OIL FILTER		C			See NOTE 3	See Parts Manual
10	HYDRAULIC TANK BREATHER		X			Clean or Replace	See Parts Manual
	GOVERNOR OIL, MAZDA 4–121G		C			200 ml (6.8 oz)	Engine Oil
17	MAST PIVOTS SLIDING SURFACES AND LOAD ROLLER SURFACES		 L L			 2 Fittings As Required	 Multi–Purpose Grease See NOTE 4 Multi–Purpose Grease
12	LIFT CHAIN		X, L			As Required	Engine Oil
18	WHEEL NUTS DRIVE WHEELS S/H1.25–1.75XL (S/H25–35XL) S2.00–3.00XL (S40–60XL) H2.00–3.00XL (H40–60XL) STEER WHEELS H2.00–3.00XL (H40–60XL) SPACERS IF DUAL WHEELS ARE INSTALLED (ALL)		X			Check Torque	 155 N.m (115 lbf ft) 240 to 305 N.m (175 to 225 lbf ft) 610 to 680 N.m (450 to 500 lbf ft) 237 to 305 N.m (175 to 225 lbf ft) 98 N.m (80 lbf ft)

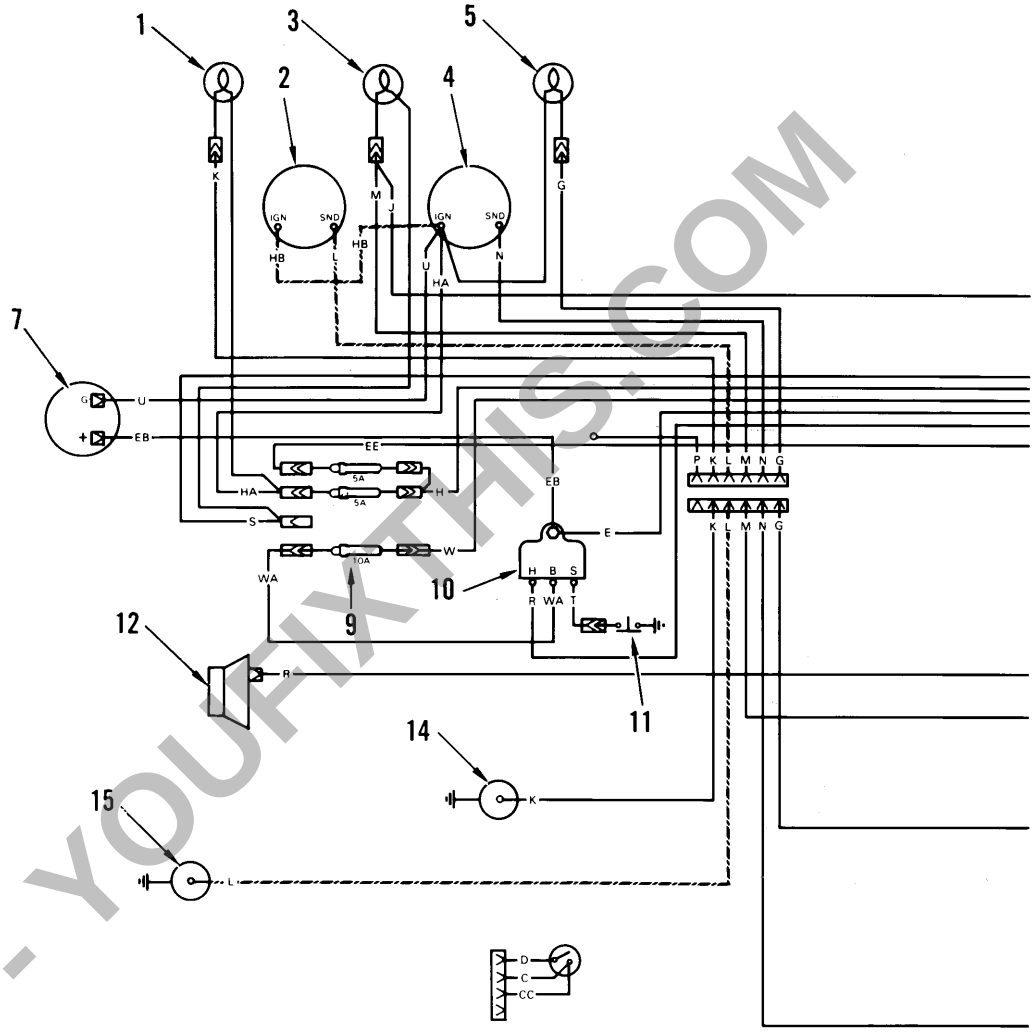
X= Check C=Change L=Lubricate

NOTE 3: Change filters on new lift trucks after first 100 hours.
NOTE 4: Multi–Purpose Grease with 2 to 4% Molybdenum Disulfide.

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WIRE	COLOR	GAGE (AWG)
A	RED	12
B	GREEN	16
C	YELLOW	12
D	WHITE	12
E	BLACK	14
F	BROWN	16
G	ORANGE	16
H	BLUE	16
J	BLACK	16
K	RED	16
L	GREEN	16
M	YELLOW	16
N	WHITE	16
P	BLUE	12
R	YELLOW	16
S	GREEN	12
T	ORANGE	16
U	RED	16
V	ORANGE	16
W	BROWN	16
Y	RED	12
Z	YELLOW	12
AA	RED	12
EA	BLACK	14
EB	BLACK	14
EC	BLACK	14
HA	BLUE	16
HB	BLUE	16
SB	GREEN	12
SC	GREEN	12
WA	BROWN	16
AB	RED	12
CC	RED	12
CD	BLACK	14
DA	WHITE	12
ED	BLACK	14
WW	RED	16
AC	PURPLE	
AD	RED/PURPLE	
EE	BLUE	16
JJ	WHITE	12
HM	YELLOW	16
PM	BLACK	16
XM	RED	16
WX	YELLOW	12
LL	WHITE	12



DIRECTION CONTROL LEVER
NEUTRAL START SWITCH
DETAIL "A"

USED ON GASOLINE LIFT TRUCKS ONLY

1. LIGHT, ENGINE OIL PRESSURE
2. GAUGE, FUEL LEVEL
3. LIGHT, TRANSMISSION OIL TEMPERATURE
4. GAUGE, WATER TEMPERATURE
5. LIGHT, DISCHARGE INDICATOR
6. DISTRIBUTOR
7. HOURMETER
8. SPARK PLUGS
9. IN–LINE FUSES
10. HORN RELAY
11. HORN SWITCH
12. HORN
13. FUEL SHUT OFF

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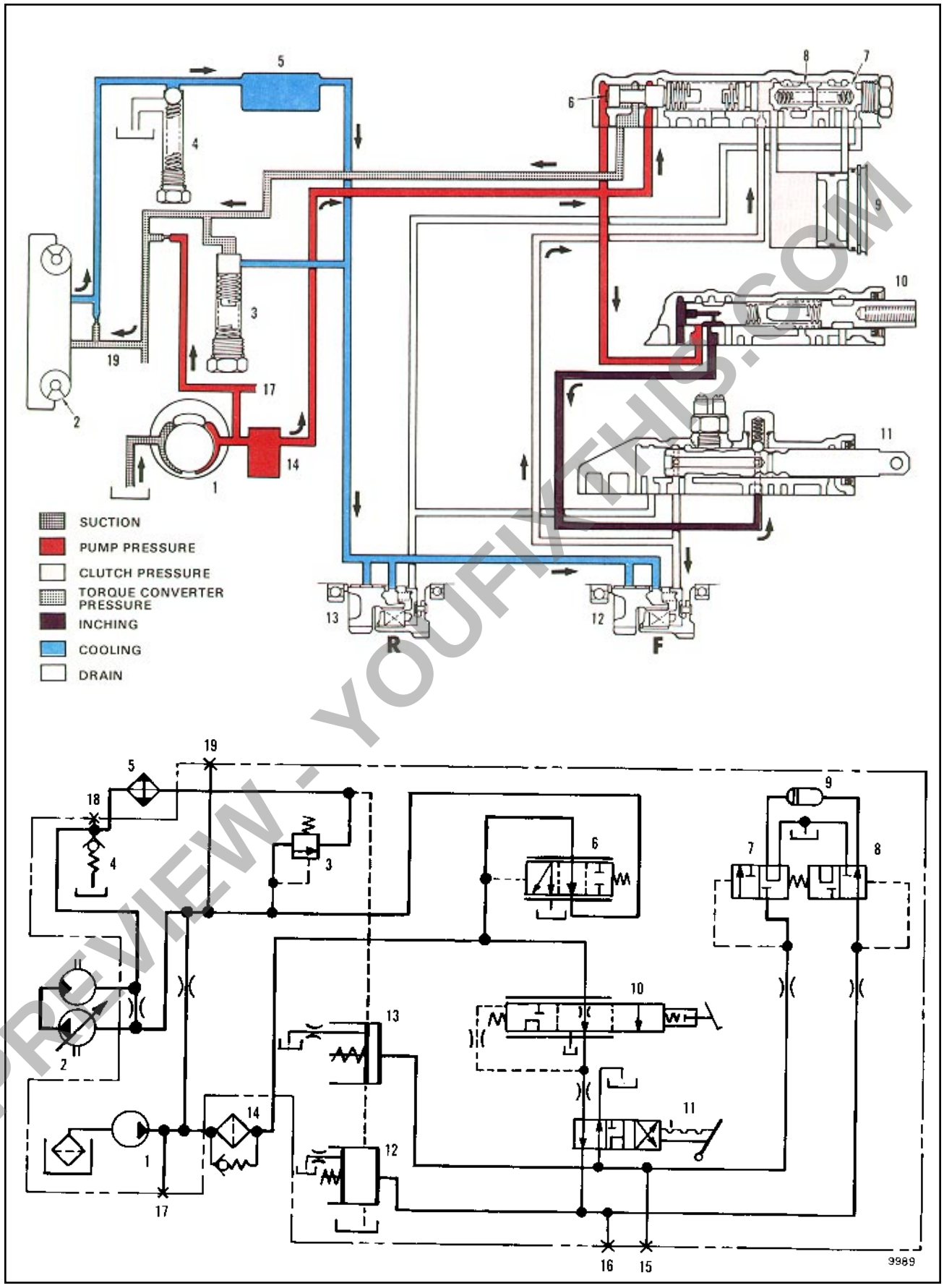


FIGURE 18. OIL FLOW IN FORWARD-INCHING

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TORQUE SPECIFICATIONS

MODEL	CAPSCREWS FOR HANGER CAPS FOR PIVOT PINS	
	N.m	ft lbf
S25–35XL	66	49
H25–35XL	66	49
E30–120B	244	180
S30–120E	244	180
H40–60J	88	65
H60–110E	176	130
MODEL	**CAPSCREWS FOR PIVOT PINS**	
H40–60XL	90	66
J40–60A	108	80
H60–110E	104	77
MODEL	**BOLTS BETWEEN OUTER WELDMENT AND HANGER CAPS**	
S25–35XL	555	410
H25–35XL	555	410

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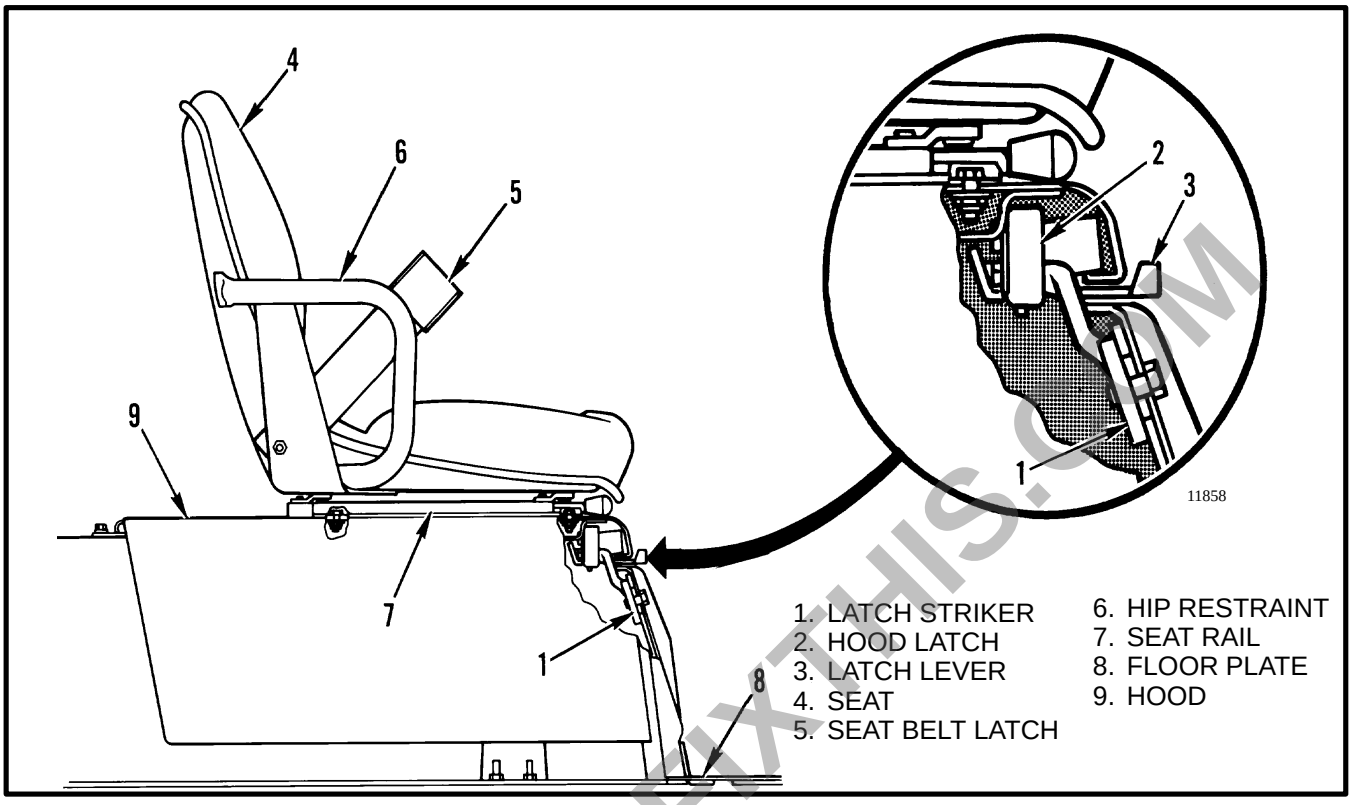


FIGURE 4. CHECK THE HOOD AND SEAT LATCHES

ENGINE REMOVAL AND INSTALLATION

Removal of the Engine and Transmission

1. Do the following steps as described in the paragraphs at the beginning of this section:

   a. Remove the hood and seat.

   b. Remove the floor plates and the front panel from the engine compartment.

   c. Remove the counterweight. Make sure that you use the correct procedures to disconnect and remove an LPG tank.

   d. Remove the overhead guard. See CAB REPLACEMENT in this section if the lift truck has a cab.

   e. Remove the radiator.

⚠ WARNING

Always disconnect the cables at the battery before you make repairs to the engine. Disconnect the cable at the negative terminal first.

2. Disconnect the cables at the battery.

3. Put the lift truck on blocks so that you have access under the lift truck.

4. Drain the engine oil if the engine will be disassembled.

5. Disconnect the hydraulic lines.

Lift trucks with serial codes A177:

a. **Mazda and Isuzu engines**. Disconnect the inlet line and the return hose at the main control valve. Disconnect the return hose at the back of the hydraulic filter and remove the hydraulic filter and plate from the frame. Disconnect the steering return line and the line from the steering relief valve at the hydraulic tank. Disconnect the steering supply line at the hydraulic pump and remove the clamp that holds the line. Disconnect the suction line at the hydraulic pump on the Isuzu engine. On the Mazda engine, disconnect the hose at the tube that is fastened to the flywheel housing. Put a plug in the hose. Move the hose out of the support bracket on the flywheel housing.

Lift trucks with serial codes B177 and C177:

a. **Mazda and Isuzu engines**. Disconnect the inlet line and the return hose at the main control valve.

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ENGINE ELECTRICAL SPECIFICATIONS

Item	Mazda M4–121G (A177, B177, C177)*	GM 4–181 (C177)*	Isuzu C240 (A177, B177, C177)*	Isuzu 4JB1 (C177)*
All Models	12 volt Negative Ground	12 volt Negative Ground	12 volt Negative Ground	12 volt Negative Ground
Alternator Output (hot)	35 amps (A177) or 56 amps (B/C177) @3000 rpm	56 amps @2750 rpm	56 amps @3000 rpm	56 amps @2350 rpm
Distributor Points A177 Only	0.4 to 0.5 mm (0.016 to 0.020 in)	Electronic ignition system	Not Applicable	Not Applicable
Spark Plug Type	NGK BP–2E or ND W9EPR	AC R46TS or Champion RBL 17Y	Not Applicable	Not Applicable
Gap	0.7 to 0.8 mm (0.028 to 0.032 in)	1.1 mm (0.045 in)	Not Applicable	Not Applicable

*Lift truck serial number code

HYDRAULIC SPECIFICATIONS

Item	Specification
Pump Type	Gear Pump with Flow Control Valve
Main Flow (to Lift, Tilt, and Attachments)	
A177** @ 2000 rpm with no load	32.9 litres per minute (8.7 gallons per minute)
B177** @ 2000 rpm with no load	35.2 litres per minute (9.3 gallons per minute)
C177** @ 2000 rpm with no load,	
Mazda or Isuzu Engines	44.7 litres per minute (14.3 gallons per minute)
GM 4–181 Engine	54.1 litres per minute (14.3 gallons per minute)
**Lift truck serial number code	
Controlled Flow (to Steering, all units)	6.4 litres/minute (1.7 gallons per minute)
Relief Pressure, Lift System	
Control valve with three spools and one relief valve	19.3 to 20.0 MPa (2800 to 2900 psi) at full flow (Check at inlet line to control valve port.)
Control valves with four spools and two relief valves:	
Primary relief valve	19.3 to 20.0 MPa (2800 to 2900 psi) at full flow (Check at inlet line to control valve port with lift spool in full Lift position.)
Secondary relief valve	15.2 to 15.9 MPa (2200 to 2300 psi) at full flow (Check at inlet line to control valve port with tilt spool in full Tilt position.)
Relief Pressure, Steering System, all units	10.3 to 11.0 MPa (1435 to 1552 psi) @ 1000 rpm
Capacity, Hydraulic System	35.0 litre (9.2 gallons)
Capacity, Hydraulic Tank	31.8 litre (8.4 gallons)
Hydraulic System Hydraulic oil temperature at 55 to 65°C (130 to 150°F). Hydraulic oil with different viscosity will change “flow” values.	

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ITEM NO.	ITEM	8 Hr./ Daily	250 Hr./ 6 wk.	1000 Hr./ 6 mo.	2000 Hr./ 1 yr.	PROCEDURE OR QUANTITY	SPECIFICATION
19	STEERING AXLE		L				Multi–Purpose Grease See NOTE 4
	S/H1.25–1.75XL (S/H25–35XL)						
	PIVOT PIN					1 Fitting	
	TIE RODS					4 Fittings	
	H2.00–3.00XL (H40–60XL)						
	PIVOT PIN					1 Fitting	
	TIE RODS					4 Fittings	
	KING PIN BEARINGS (UPPER AND LOWER)					2 Fittings	
	S2.00–3.00XL (S40–60XL)						
	KING PIN BEARINGS (LOWER)					2 Fittings	
	ENGINE SPEED		X			Adjust as Required	
	IDLE SPEED						
	Mazda & GM 4–153						600 to 650 rpm
	GM 4–181						550 to 600 rpm
	Isuzu C240						600 to 650 rpm
	Isuzu 4JB1						750 to 800 rpm
	GOVERNED SPEED						
	S/H1.25–1.75XL (all units) (S/H25–35XL)						2600 to 2700 rpm
	S2.00–3.00XL (S40–60XL)						
	Mazda 4–121G						2700 to 2800 rpm
	GM 4–181 and GM 4–153 (B187)						2550 to 2650 rpm
	GM 4–181 (C187)						2700 to 2800 rpm
	Isuzu C240						2500 to 2600 rpm
	H2.00–3.00XL (H40–60XL)						
	Mazda 4–121G						2900 to 3000 rpm
	GM 4–181						2700 to 2800 rpm
	Isuzu C240						2900 to 3000 rpm
	Isuzu 4JB1						2250 to 2350 rpm
	PCV VALVE, GM ENGINES			X	C	Replace as Necessary	See Parts Manual
20	DIFFERENTIAL OIL			X	C		SAE 80W–90, 85W–140
	S2.00–3.00XL (S40–60XL)					3.8 litre (4.0 qt)	
	H2.00–3.00XL (H40–60XL)					7.6 litre (8.0 qt)	
	TIMING			X		Adjust as Required	
	MAXDA 4–121G						Gasoline – 9° BTDC LPG – 18° BTDC at 625 rpm
	GM 4–153 only						8° BTDC at 600 rpm
	GM 4–181						Electronic Control
	ISUZU C240						14° BTDC Static
	ISUZU 4JB1						16° BTDC Static

X= Check C=Change L=Lubricate NOTE 4: Multi–Purpose Grease with 2 to 4% Molybdenum Disulfide.

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lines at the ports in the transmission housing. Connect the lower coolant hose to the radiator.

2. Install the fan and fan shroud in position on the radiator. Install the four capscrews that hold the fan shroud and the radiator to the frame. Install the capscrews that fasten the fan to the hub. Connect the upper coolant hose at the radiator.

OVERHEAD GUARD

⚠ WARNING

Do not operate the lift truck without the overhead guard correctly fastened to the lift truck.

Changes that are made by welding, or by drilling holes that are too big in the wrong location, can reduce the strength of the overhead guard. See the instructions for "Changes to the Overhead Guard" in the PERIODIC MAINTENANCE (8000 SRM 259) section included with this lift truck.

Removal and Installation

Connect a crane or lifting device to remove or install the overhead guard. If the lift truck has an overhead exhaust, disconnect and remove the exhaust pipe assembly. Four bolts hold the overhead guard to the frame. The overhead guard is fastened to the cowl and the rear frame plate. Disconnect any electric wires from under the cowl that go through the legs of the overhead guard. When the overhead guard is lifted from the frame, make sure any electric wires are moved through the holes in the frame so that they are not damaged.

OPERATOR RESTRAINT SYSTEM (See FIGURE 3. and FIGURE 4.)

The seat belt, hip restraint brackets, seat and mount, hood, latches and floor plates are all part of the operator restraint system. Each item must be checked to make sure it is fastened correctly, functions correctly and is in good condition.

The end of the seat belt must fasten correctly in the latch. Make sure the seat belt pulls from the retractor assembly and retracts smoothly. The seat belt must be in good condition. A seat belt that is damaged or worn will not give protection when it is needed. If the seat belt can not be pulled from the retractor assembly, remove the screw that keeps the cover on the retractor. Push the bar to release the spool. Straighten the belt so that it will pull and retract smoothly from the retractor assembly. See FIGURE 3.

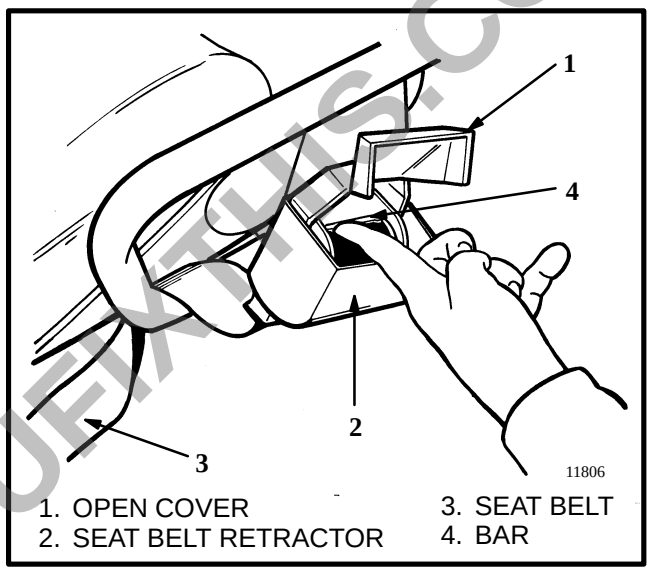


FIGURE 3. RELEASE A JAMMED SEAT BELT

See FIGURE 4. Make sure the seat rails and latch striker are not loose. The seat rails must lock tightly in position, but move freely when unlocked. The seat rails must be correctly fastened to the mount surface. If the mount surface is the hood, the hood must be fastened to the floor plate with the latch. The floor plate must be fastened to the lift truck frame. Try to lift the hood to make sure it is fastened correctly and will not move.

Adjust the hood, hood latch and latch striker when any of the parts of the operator restraint system are installed or replaced. See HOOD in this section for the adjustment procedures.

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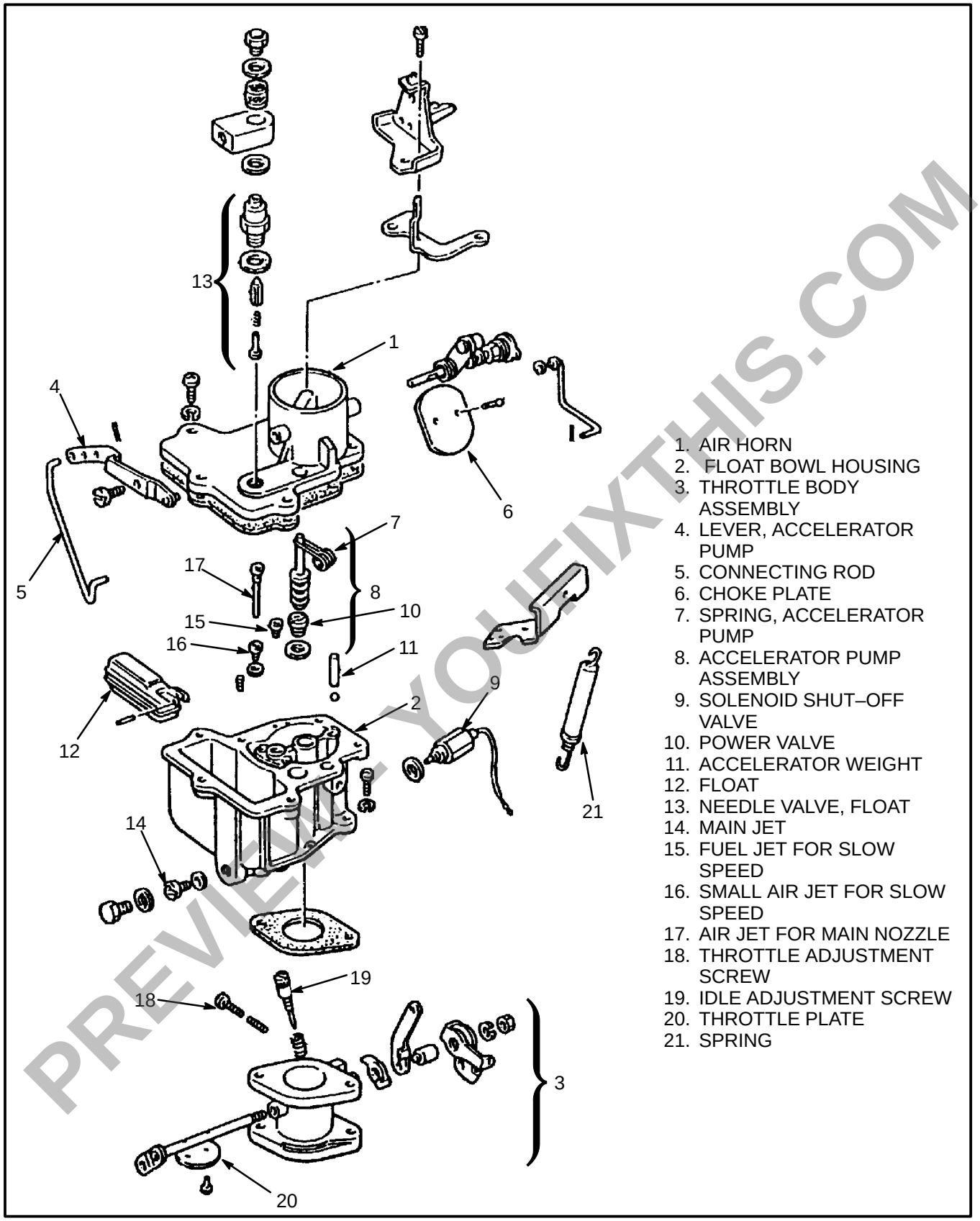
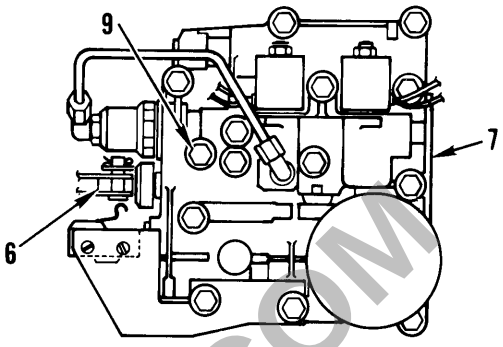


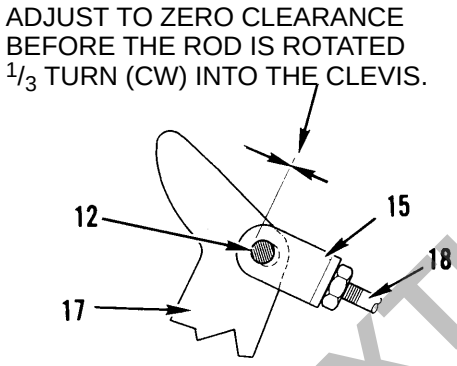
FIGURE 4. PARTS OF THE CARBURETOR

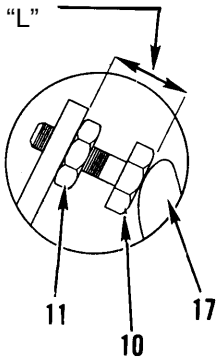
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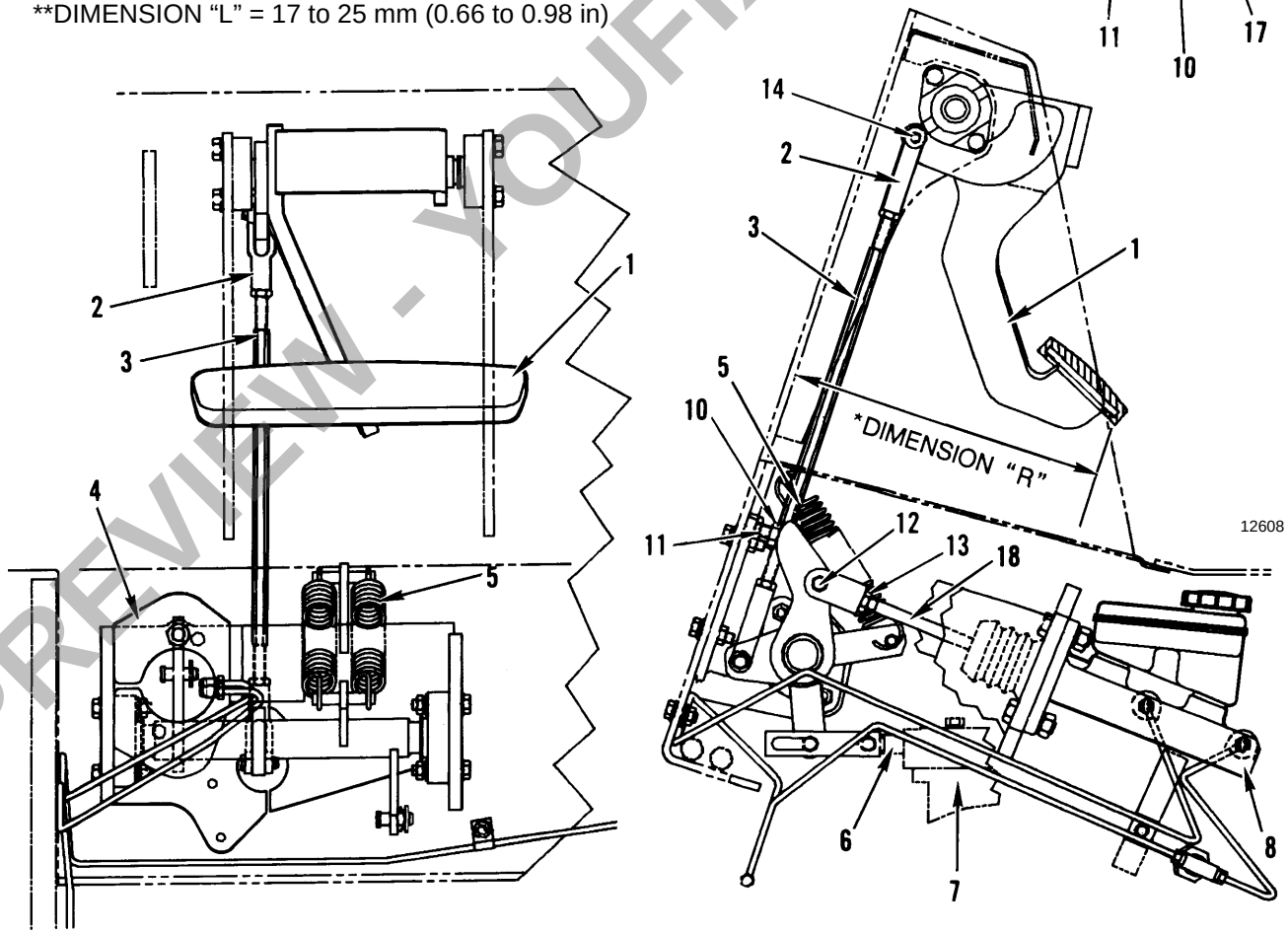
1. INCHING/BRAKE PEDAL
2. CLEVIS
3. LINKAGE ROD
4. BRACKET
5. RETURN SPRING, PEDAL
6. INCHING PLUNGER
7. TRANSMISSION CONTROL VALVE
8. MASTER CYLINDER
9. TEST PORT, TP2
10. CAPSCREW, ADJUSTER
11. LOCK NUT
12. PIN
13. LOCK NUT
14. PIN
15. CLEVIS
16. LOCK NUT
17. BRAKE LINKAGE
18. ROD







*DIMENSION "R" = 260 mm (10.2 in)
**DIMENSION "L" = 17 to 25 mm (0.66 to 0.98 in)



LIFT TRUCKS WITH SERIAL NUMBER CODE B177 AND C177 – MASTER CYLINDER ONLY

FIGURE 48. PEDAL ADJUSTMENT, H2.00–3.00XL (H40–60XL), LATER PRODUCTION

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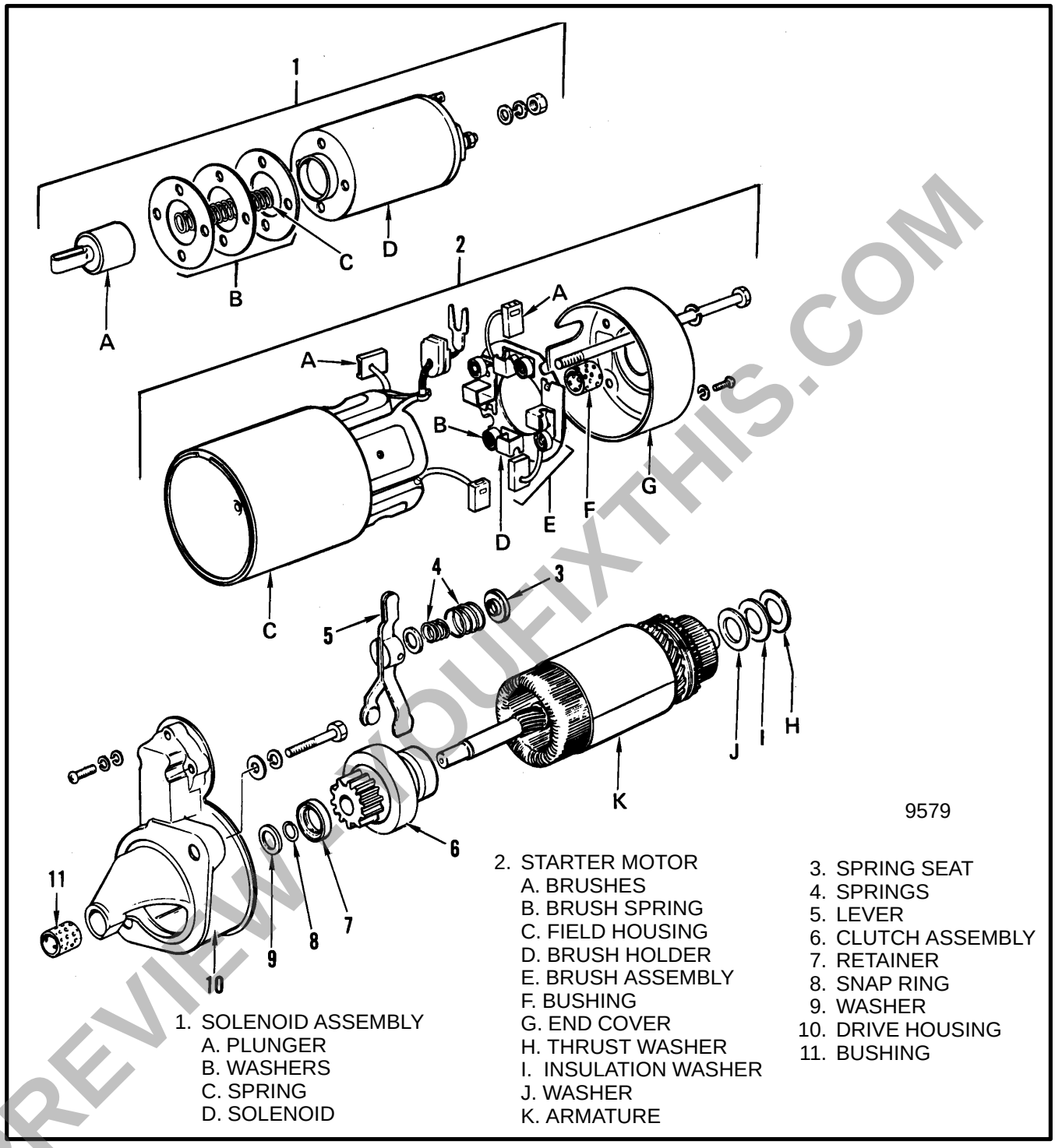


FIGURE 6. PARTS OF THE STARTER

5. Install the end cover, the two long bolts and the two screws that fasten the end cover.

6. Install the solenoid washers, spring and solenoid on the drive housing using the three screws. Connect the strap from the motor to the motor terminal of the solenoid. Install the washer, lock washer and nut on the motor terminal. Tighten the nut.

7. Install the starter on the flywheel housing using the two capscrews.

8. Install all the electrical leads to the correct solenoid terminals as marked on the labels. Install the plate that fastens to the engine between the fuel pump and starter.

9. Connect the battery cable to the negative terminal of the battery.

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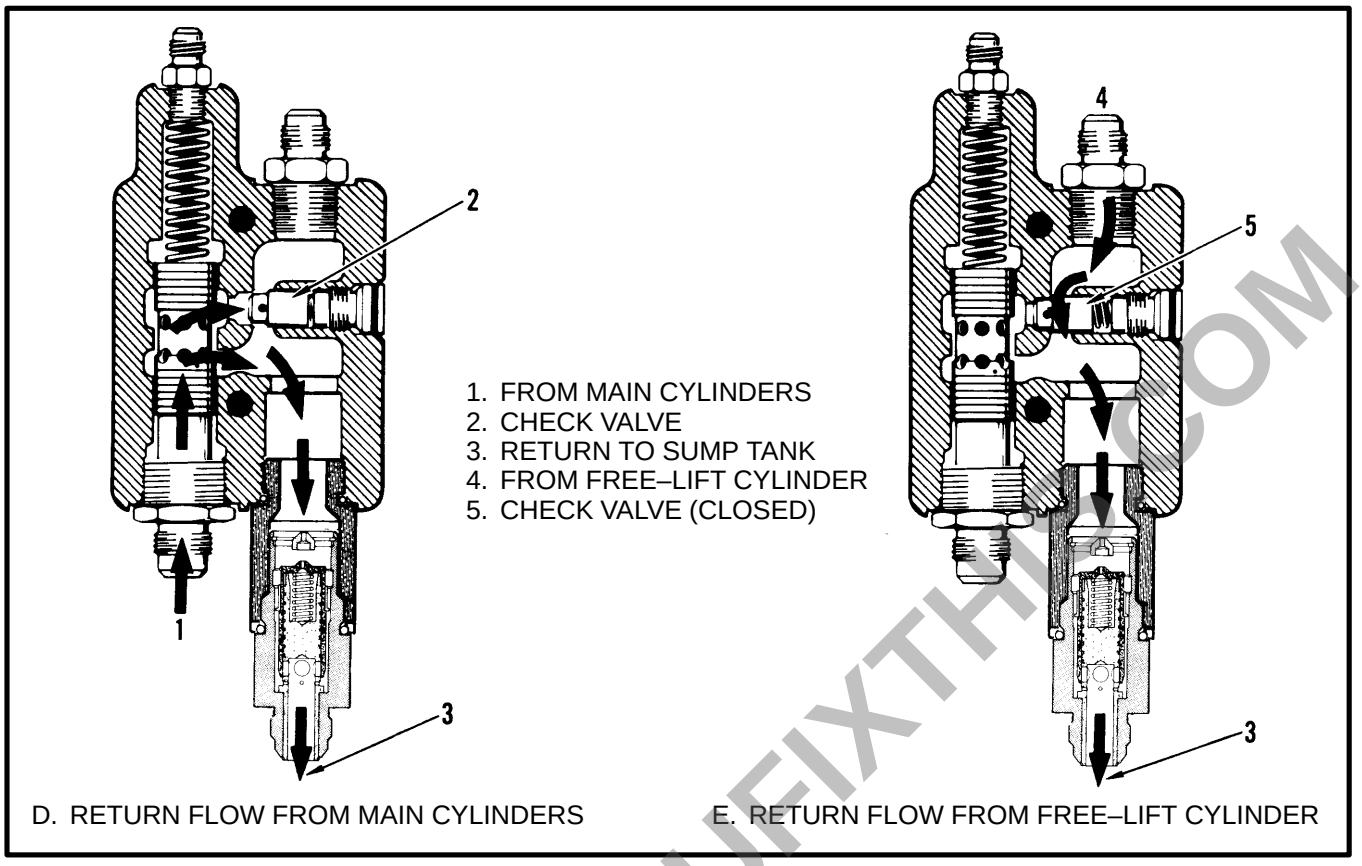


FIGURE 17. SEQUENCE VALVE – LOWERING

When the hoist spool is moved to the Lowering position, the oil from the main cylinders returns to the tank. See FIGURE 17. The main cylinders lower first since they have a greater pressure. At the maximum lowering, the high flow of oil causes the spool to move and close the passage to the hydraulic tank. The check valve in the sequence valve will open to give an additional passage for the oil. All the oil from the cylinders return to the tank through the lowering control regulator. See the section on **LIFT CYLINDERS, 4000 SRM 135,** for more information on the lowering control regulator.

After the main cylinders have fully lowered, the check valve closes and the free–lift cylinder begins to lower. The oil from the free–lift cylinder also returns to the tank through the lowering control regulator. See the section on the **LIFT CYLINDERS, 4000 SRM 135,** for more information on the lowering control regulator.

Removal and Disassembly

1. Fully lower all the masts.

2. Disconnect the lines from the sequence valve. Make sure to put caps on the open lines.

3. Remove the sequence valve.

4. Remove the lowering control regulator assembly.

5. Remove the fittings from the valve body. Remove the spool and spring. Remove the check valve assembly.

Cleaning

Wash all parts of the sequence valve with solvent. Make sure that all the ports in the spool are clean.

Assembly and Installation

1. Use new O–rings and lubricate all the parts of the sequence valve with clean hydraulic oil during assembly.

2. Make sure the spool moves freely in the bore.

3. Install the sequence valve to the mast. Install the hydraulic lines. Check for leaks and correct operation.

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