

D33 Engine

Safety, Operation, Maintenance & Parts Manual

LT40 Series

rev. C7.00



Safety is our #1 concern! Read and understand all safety information and instructions before operating, setting up or maintaining this machine.

February 2003

Form #915

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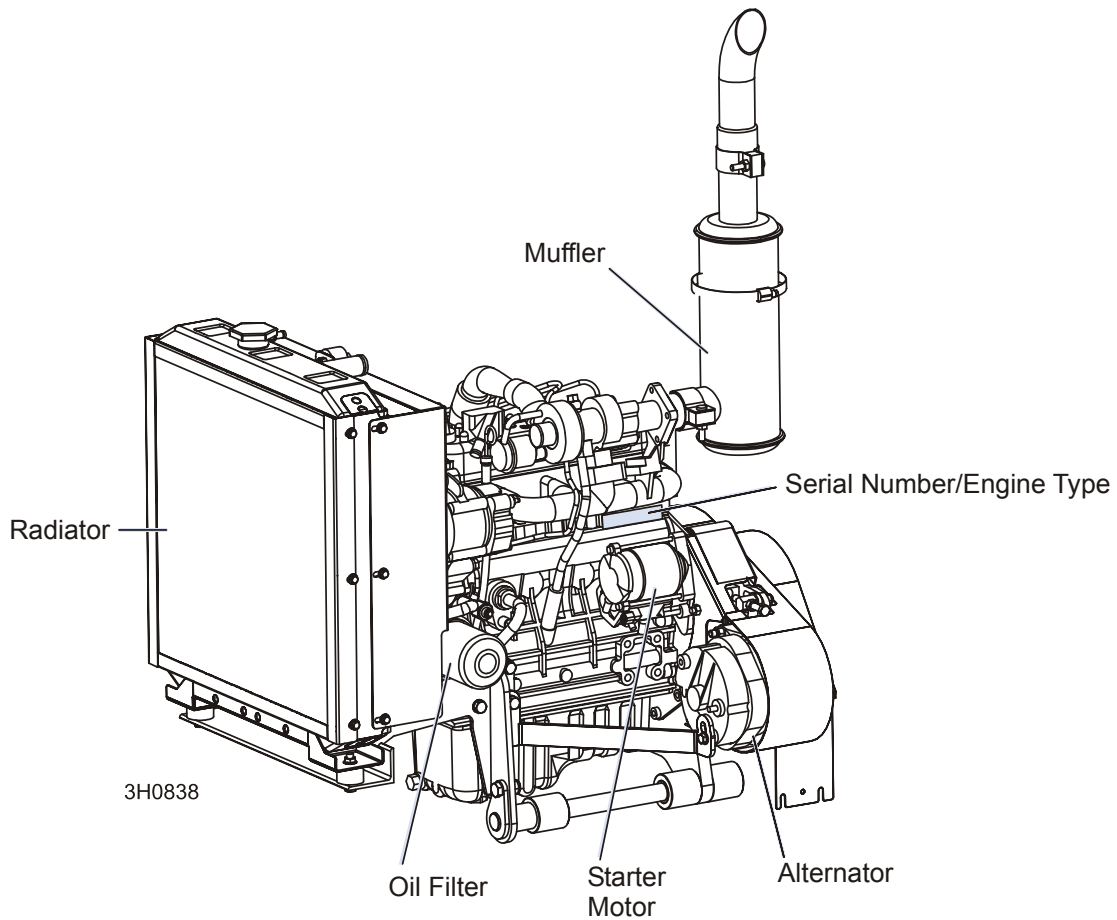
ABOUT THIS MANUAL

This manual is provided as a supplement to the equipment manufacturer's manuals. This manual provides information specific to the use of this equipment on the Wood-Mizer® sawmill. Refer to the sawmill operator's manual and manufacturer's manual before attempting to operate this equipment.



IMPORTANT! Read the sawmill operator's manual and engine manufacturer's manual for instructions and safety precautions before operating this equipment.

The information and instructions given in this manual do not amend or extend the limited warranties for the equipment given at the time of purchase.




ENGINE COMPONENTS

SECTION 1 OPERATION


1.1 Starting The Engine

Control Lights


See Figure 1-1. The following indicator lights are located on the sawmill control panel.

 *Alternator Charge Indicator:* Lights up if the alternator is not charging the battery.




 *Engine Temperature Indicator:* Lights up if the engine is overheating. A circuit breaker assembly in the engine harness will shut the engine off if the engine overheats. Turn the key switch off and allow the engine to cool for a period of time before restarting. If the overheating condition persists, stop operating the engine until the condition is corrected. The engine will automatically switch to low idle if an overheating condition occurs.




 *Key Switch Indicator:* Lights up when the key is in either the on or accessory (#1 or #3) position.



 *Oil Indicator:* Lights up if the oil pressure is too low.



 *Glow Plug Indicator:* Lights up after the key has been turned to the on (#1) position.

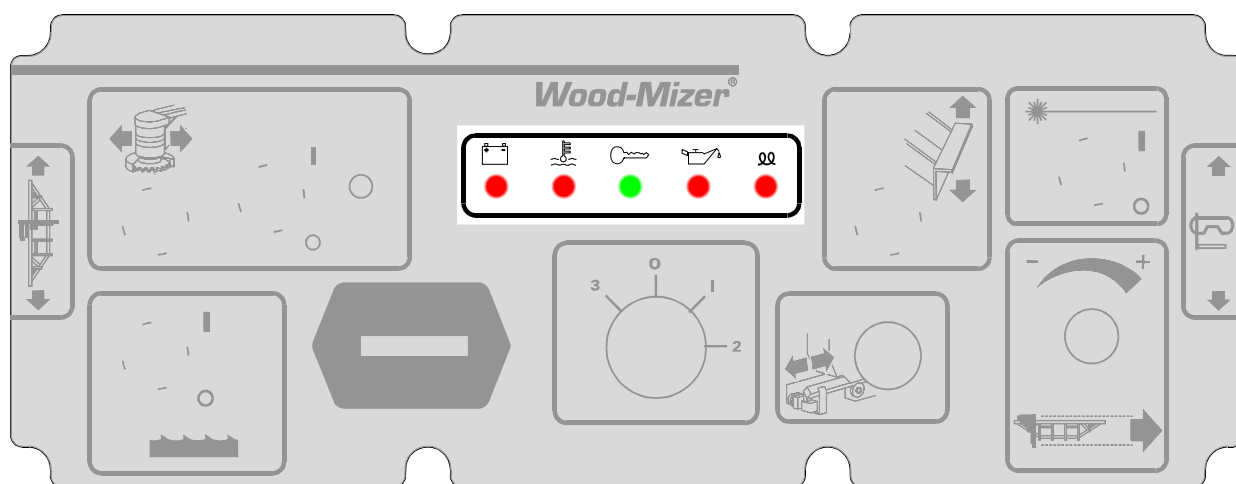


FIG. 1-1

Engine Start



DANGER! Always be sure the blade is disengaged and all persons are out of the path of the blade before starting the engine. Failure to do so will result in serious injury.

DANGER! Operate your engine/machine only in well ventilated areas. The exhaust gases of your engine can cause nausea, delirium and potentially death unless adequate ventilation is present.

DANGER! Never operate an engine with a fuel or oil leak. The leaking fuel or oil could potentially come in contact with hot surfaces and ignite into flames.



WARNING! Be sure the power feed switch is in the neutral position before turning the key switch to the on (#1) or accessory (#3) position. This prevents accidental carriage movement which may cause serious injury or death.

WARNING! Do not operate engine without proper and operational spark arrester/muffler. Sparks emitted from the engine exhaust could ignite surrounding materials, causing serious injury or death.



CAUTION! Do not crank starter for more than 7 seconds at one time during starting attempts. Damage to the engine may result.

CAUTION! Let engine idle for 2 minutes before applying load to prevent engine damage.

1. See the engine manufacturer's manual for lubricating oil recommendations for specific temperature ranges.
2. Use a best quality diesel fuel for below freezing starting.
3. Turn the key switch on the control panel to the on (#1) position.
4. Wait until the glow plug indicator goes out.
5. Turn the key switch to the start (#2) position and release.

1 Operation

Starting The Engine

Engine Shutoff



CAUTION! A minimum 2 minute idle time is recommended to allow the battery charge to recover before the engine is shut off.

Turn the key switch to the off (#0) position.

SECTION 2 MAINTENANCE

Refer to the manufacturer's manual for maintenance intervals and procedures unless otherwise instructed in this manual. Follow the manufacturer's recommendations for dusty conditions.



IMPORTANT! This manual only provides information about additional procedures or procedures to be performed at different time intervals than found in the manufacturer's manuals. Refer to the manufacturer's manual for complete maintenance instructions.

2.1 Safety

Use caution when performing maintenance or service to the engine.



DANGER! Always be aware of and take proper protective measures against rotating shafts, pulleys, fans, etc. Always stay a safe distance from rotating members and make sure that loose clothing or long hair does not engage rotating members resulting in possible injury.

DANGER! Engine components can become very hot during operation. Avoid contact with any part of a hot engine. The exhaust components of your engine are especially hot during and following operation. Contact with hot engine components can cause serious burns. Therefore, never touch or perform service functions on a hot engine. Allow the engine to cool sufficiently before beginning any service function.



WARNING! Remove the blade before performing any engine service. Failure to do so may result in serious injury.

WARNING! Always wear proper and necessary safety equipment when performing service functions. Proper safety equipment includes eye protection, breathing protection, hand protection and foot protection.



This symbol identifies the interval (hours of operation) at which each maintenance procedure should be performed. "AR" signifies maintenance procedures which should be performed as required.

2.2 Cooling System



Clean the radiator fins every 8 hours of operation. Spray the radiator with water from a hose or compressed air to clean sawdust from the radiator fins. Do not use a pressure sprayer.



CAUTION! Failure to keep the radiator fins clear of sawdust and/or dirt may cause the engine to overheat resulting in damage to the engine.

2.3 Fuel Filter

1500

See Figure 2-1. Replace the primary fuel filter cartridge every 1500 hours or one year of operation. After replacing the filter cartridge, loosen the air bleed screw and operate the fuel pump bail until fuel begins to flow from the valve and is free of air bubbles. Tighten the bleed screw. Inspect the water separator bowl periodically and drain the bowl as required by turning the drain cap counterclockwise as viewed from the bottom.

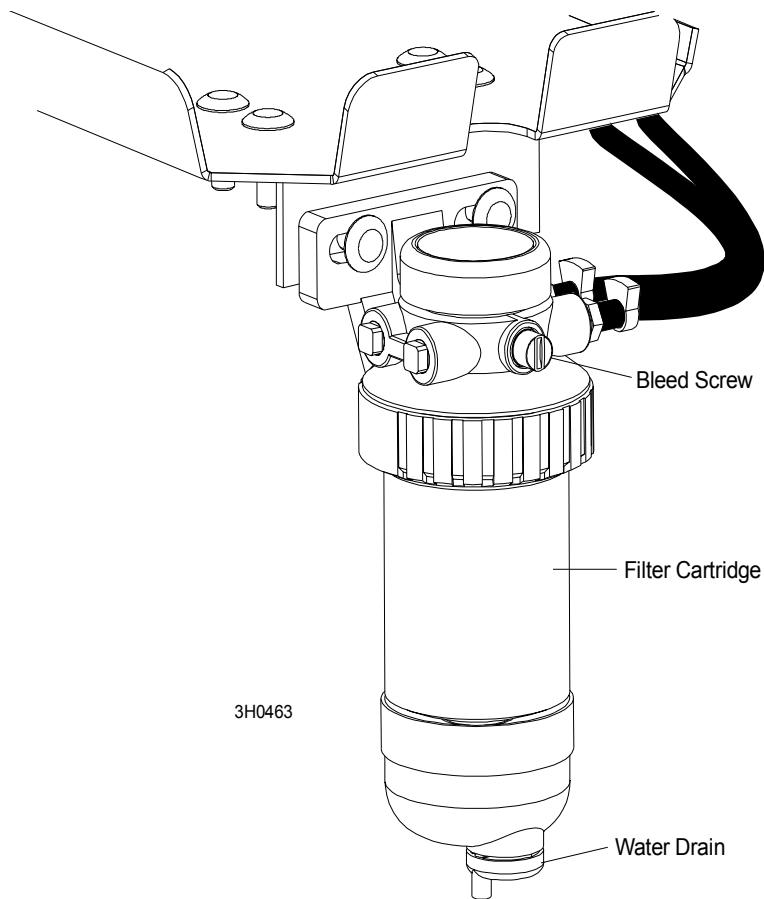


FIG. 2-1

2.4 Battery



Check the battery electrolyte level every 50 hours of operation. See manufacturer's manual for instructions.



DANGER! Batteries expel explosive gases. Keep sparks, flames, burning cigarettes, or other ignition sources away at all times. Always wear safety goggles and a face shield when working near batteries. Failure to do so will cause serious injury.¹



WARNING! Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

1. Battery Council International, copyright 1987

2.5 Alternator Belt



The belt tension should be checked after the first 100 hours of operation, when the battery is not charging properly or when the alternator belt is squealing. If the battery continues to not charge properly or the belt continues to squeal after the initial belt adjustment, replace the belt.

1. Release the blade tension and remove the blade from the sawmill if necessary. Turn the key switch to OFF (0) and remove the key.
2. Remove the drive belt cover and alternator cover.

See Figure 2-2.

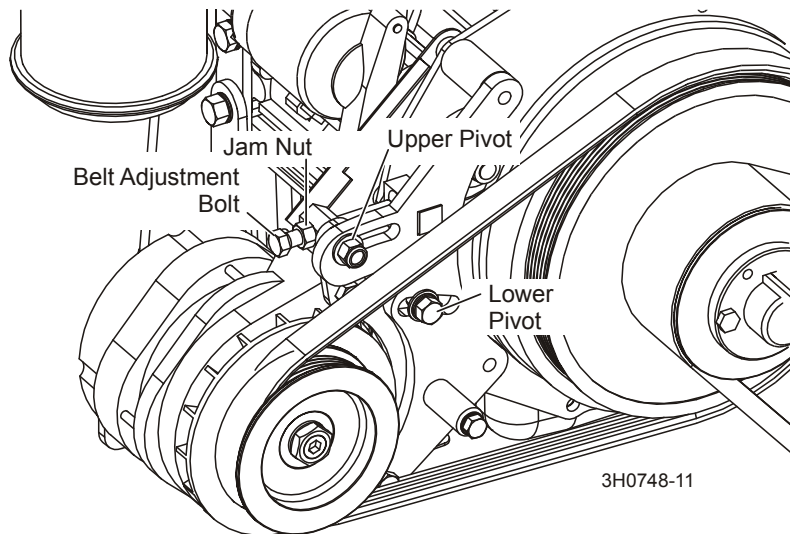


FIG. 2-2

3. Use a belt tension gauge to measure the belt tension. Place the gauge on the belt at the midpoint between the two pulleys. If the belt tension is less than 3/16" with 9 lb. of deflection, tighten the belt as described below.
4. Loosen the upper pivot, lower pivot and the adjustment bolt jam nut.
5. Turn the belt tension adjustment bolt clockwise to tighten the belt, counterclockwise to loosen the belt. Adjust the bolt until the proper belt tension is achieved.



CAUTION! Do not overtighten the alternator belt. Damage to the alternator will occur.

6. After the alternator belt has been tensioned, tighten the adjustment bolt jam nut. Tighten the upper and lower pivots and replace the belt covers.

2.6 RPM Adjustments



WARNING! Remove the blade before performing any engine service. Failure to do so may result in serious injury.



Check the RPM with a tachometer after the first 20 hours of operation and every 200 hours thereafter. High-end RPM should be 3200 RPM and low-end RPM should be 1500 RPM.

Before checking the RPM, make sure belt and brake strap tensions are correct (See Saw-mill Maintenance). Also check oil, fuel, and coolant levels.

Make sure the throttle cable does not affect the engine RPM when the clutch handle is disengaged. Make sure the cable is not bent or kinked.

1. Use the bottom threaded cable mount to adjust the throttle cable. When the clutch handle is disengaged, the throttle cable should be taut but the spring not extended. When the clutch handle is engaged, the throttle spring should extend 1/8" to 1/4". Once the throttle cable is adjusted properly, use the adjustments provided on the engine to adjust the engine RPM (3200[+0, -100] high-end, 1500[±100] idle).



CAUTION! Do not extend the throttle spring over 1/4". Excessive tension may cause the throttle cable to fail prematurely.

See Figure 2-3.

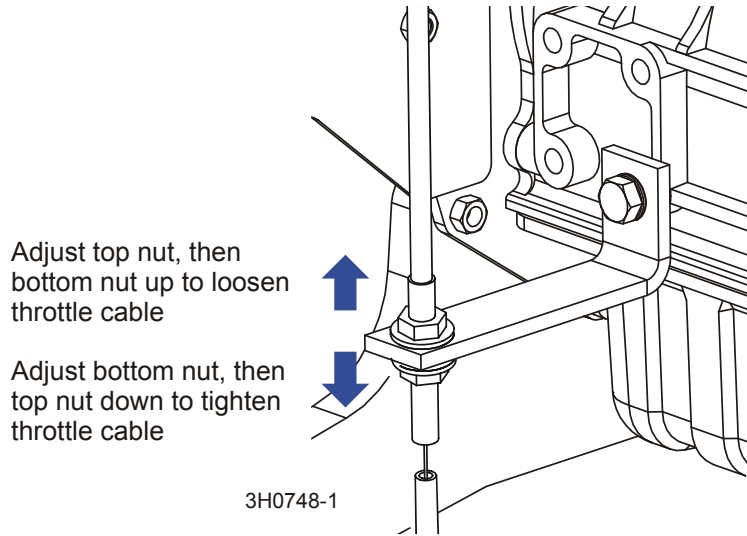


FIG. 2-3

2. Start the engine to measure the low-end RPM. Let idle for 10 minutes.
3. With the engine at idle, check the low-end RPM. Adjust to 1500. To decrease speed, loosen the idle adjustment screw. To increase speed, tighten the idle adjustment screw.

See Figure 2-4.

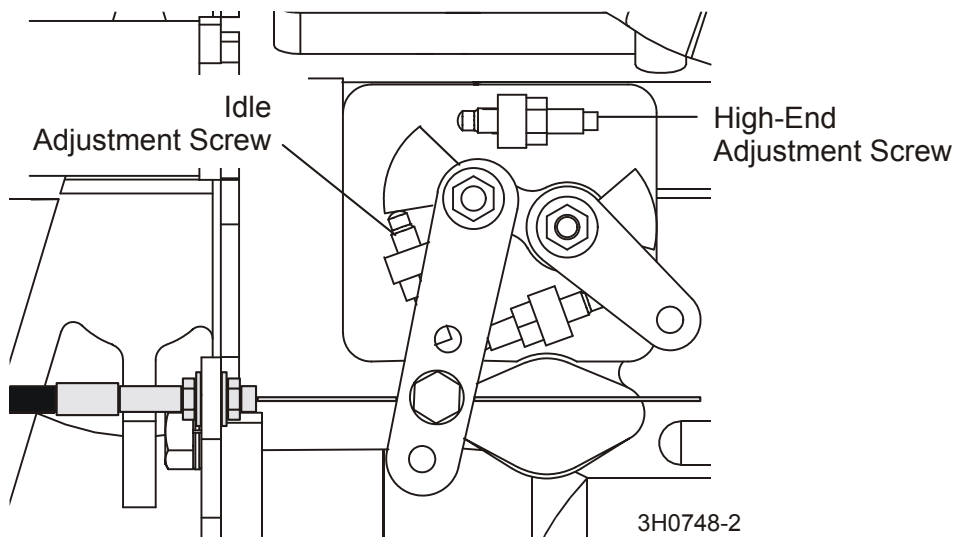


FIG. 2-4

2

Maintenance

RPM Adjustments

4. Adjust the high-end RPM to 3200. To decrease speed, tighten the high-end adjustment screw. To increase speed, loosen the high-end adjustment screw.



CAUTION! Do not adjust the high-end RPM above 3200. Doing so may cause damage to the engine.

5. After the RPM settings are made, shut the engine off. Tighten the throttle cable by engaging the clutch handle. Check the throttle cable at the upper cable mounting bracket. The cable should be centered in the cable housing. If necessary, loosen the upper bracket mounting bolts and adjust the bracket so the cable housing is centered around the cable. Retighten the upper cable bracket mounting bolts.

See Figure 2-5.

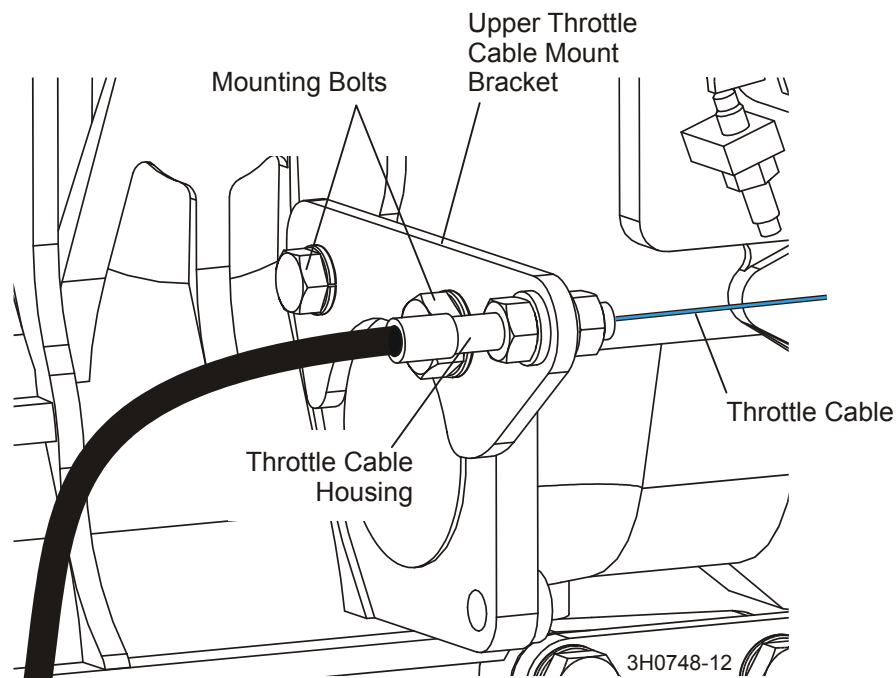


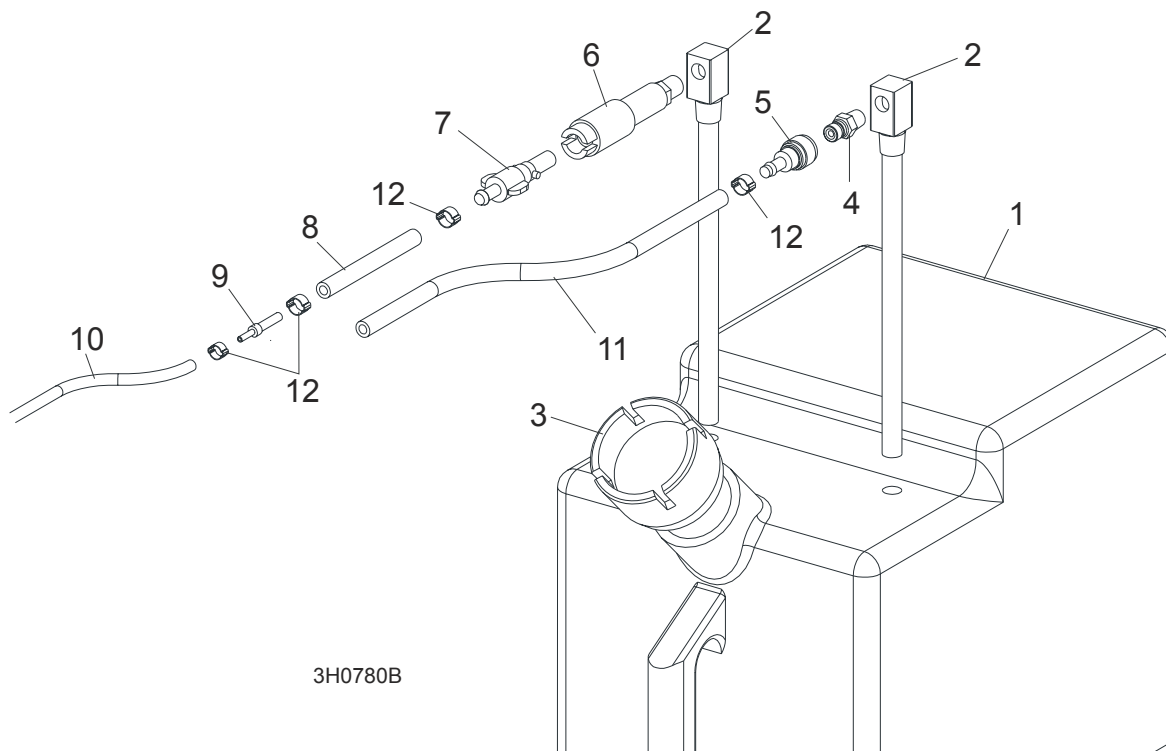
FIG. 2-5



CAUTION! Failure to properly center the throttle cable in the cable housing may result in premature cable wear.

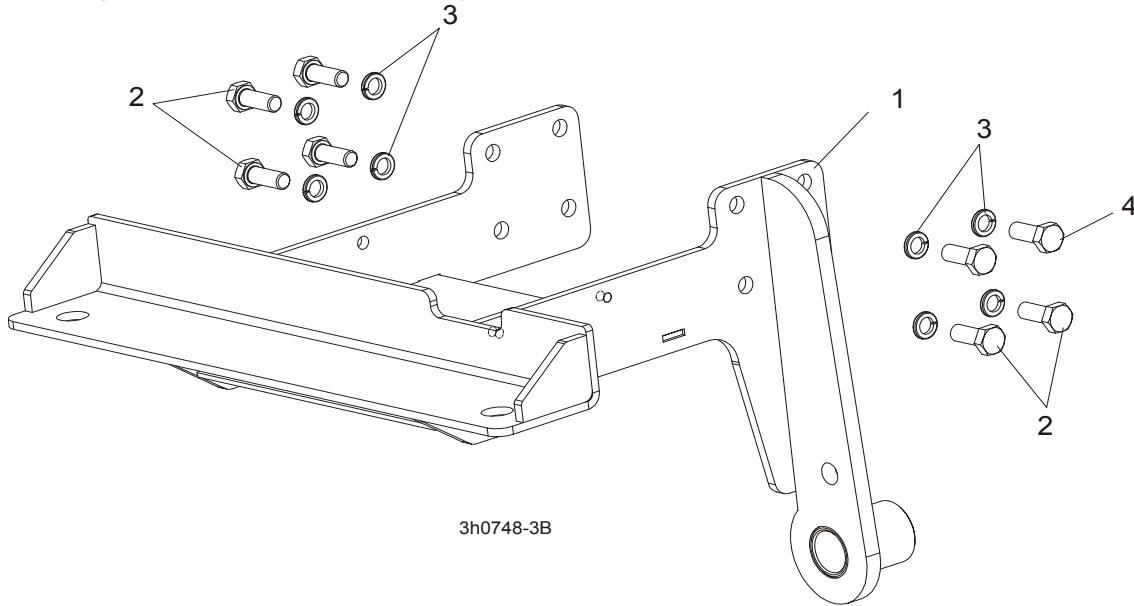
SECTION 3 REPLACEMENT PARTS

3.1 Fuel Tank



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	TANK ASSEMBLY, 5 GALLON GREEN DIESEL	A12132	1	
1	Tank, 5 Gallon Green Fuel	P12166	1	◆
2	Pickup, 9" Fuel	P12172	2	
3	Cap, 3/5 Gallon Fuel Tank	P09683	1	
4	Fitting, 1/4" NPT Male Quick Disconnect	015583	1	
5	Fitting, Female Quick Disconnect Barb	015582	1	
6	Fitting, 1/4" NPT Plastic Female Disconnect	P12175	1	
7	Fitting, 1/4" Barb Plastic Male Disconnect	P12176	1	
8	HOSE, 8MM ID FUEL	R80703-2	0.1m	
9	FITTING 8/4 HOSE BARB	089492	1	
10	HOSE, CARBURANTE 3,2X7 ID FUEL	R80703-3	2.5m	
11	HOSE, 8MM ID FUEL	R80703-2	0.6m	
12	CLAMP, 11-17MM HOSE	F81080-3	6	

3.2 Engine Mount Assembly

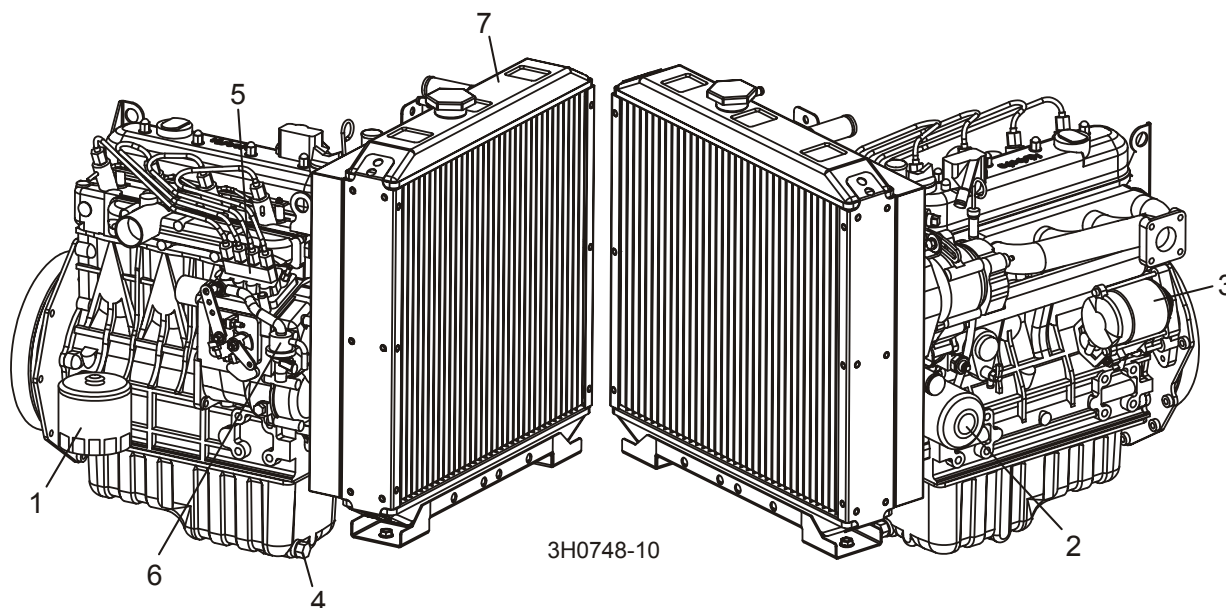


REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
1	MOUNT WELDMENT, FRONT KUBOTA ENGINE	090754-1	1	
2	BOLT, M10X25 8.8 HEX HEAD GRADE 5	F81003-31	7	
3	WASHER, 10.2 SPLIT LOCK	F81055-2	8	
4	BOLT, M10X30 5.8 HEX HEAD GRADE 5	F81003-2	1	

3 Replacement Parts

Engine Assembly

3.3 Engine Assembly



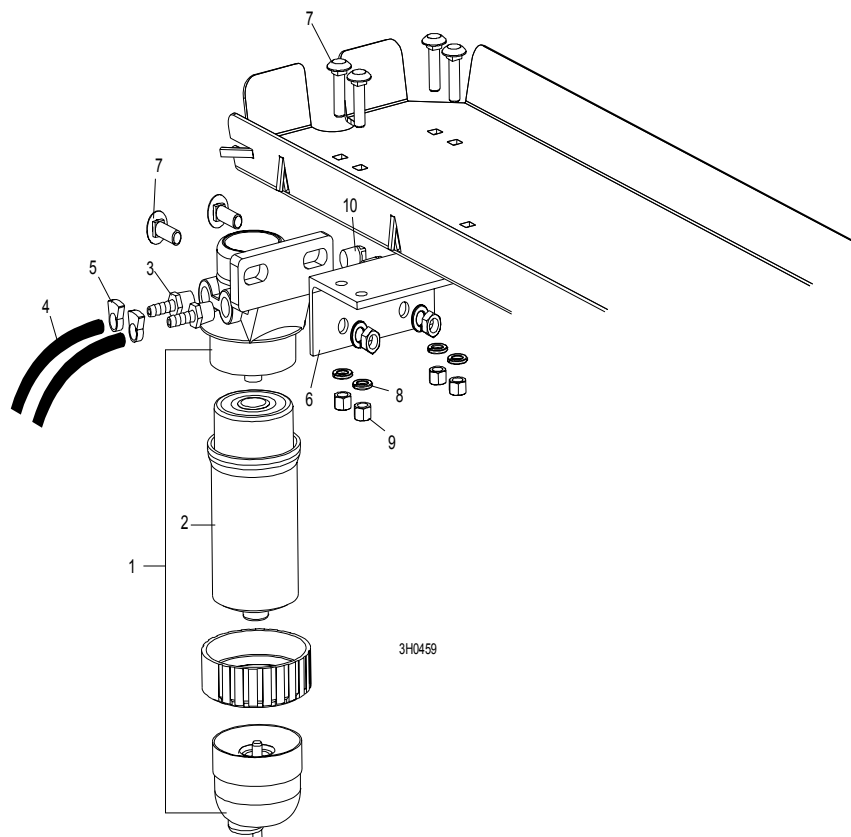
REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.
	ENGINE KUBOTA D33	090750	
	Belt, Kubota Fan #16282-97010	028514	1
	Filter, Kubota Air #17351-11083	028568	1
1	Filter, Kubota Fuel #70000-43081	028560	1
2	Filter, Kubota Oil #16271-32090	018050	1
	Gasket Kit, Kubota Lower #07916-29265	028519	1
	Gasket Kit, Kubota Upper #16285-99352	028572	1
	Gasket, Kubota Exhaust #15263-12370	028513	1
	Gasket, Kubota Fuel Injector #15841-53622	028516	1
	Gasket, Kubota Fuel Transfer Pump #16264-52140	028518	1
	Gasket, Kubota Head #16292-03310	028571	1
	Gasket, Kubota Muffler #15263-12371	028549	1
	Gasket, Kubota Oil Drain Plug #15451-96670	028543	1
	Gasket, Kubota Stop Solenoid #16299-60150	028544	1
	Gasket, Kubota Thermostat #15313-7320	028545	1
	Gasket, Kubota Valve Cover #16241-14520	028524	1
	Gasket, Kubota Water Pump #16259-73430	028526	1
	Glow Plug, Kubota #16851-65510	028562	1
	Injector, Kubota Fuel #16032-53000	028515	1
3	Motor, Kubota Starter #37560-63010	028522	1
4	Plug, Kubota Oil Drain #16541-33750	028542	1

5	Pump, Kubota Fuel Injector #16060-51010	028540	1	
6	Pump, Kubota Fuel Transfer #16285-52032	028517	1	
	Pump, Kubota Water #16241-73032	028525	1	
7	RADIATOR ASSEMBLY, KUBOTA D33	090771	1	
	Sending Unit, Kubota Heat Sensor #TM9A230RQCG	028510	1	
	Solenoid, Kubota Stop #17454-60010	028523	1	
	Switch, Kubota Oil Pressure #15841-39010	028547	1	
	Thermostat, Kubota #19434-73010	028546	1	
	HARNES ASSEMBLY, KUBOTA DIESEL ENGINE	024594	1	
	Breaker Assembly, Water Temp Max Circuit	024453	1	
	Socket, Glow Plug Relay w/Fuse Holder	024554	1	
	Fuse Link, 50 Amp	024597	1	
	Relay, Glow Plug	088143	1	

3 Replacement Parts

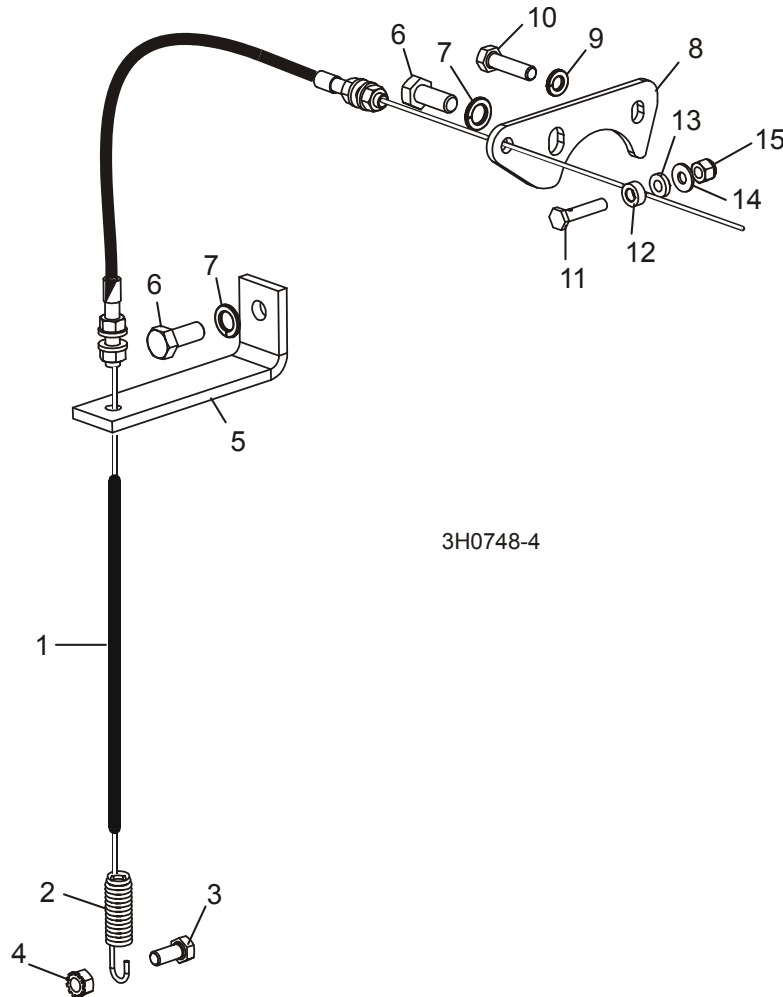
Primary Fuel Filter

3.4 Primary Fuel Filter



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.
	FILTER ASSEMBLY, FUEL 16616-43001(D52/184)	090208	1
1	FILTER ASSEMBLY, STANDADYNE FUEL FPV-5,7 04WP40/3	088101	1
2	Filter, Standadyne Fuel Cartridge #31865	015898	1
3	FITTING, 8MM, FILTR FPV-5,7	088094	2
4	HOSE, 5/16" ID FUEL	R80703-2	1.9m
5	CLAMP, 11-17MM HOSE	F81080-3	2
6	BRACKET, DIESEL FUEL FILTER MOUNT	015905	1
7	BOLT, 3/8-16 X 1 1/4" CARRIAGE HEAD	F05007-11	6
8	WASHER, 3/8" SPLIT LOCK	F05011-4	6
9	NUT, 3/8-16 HEX	F05010-1	6
10	FITTING, 1/4" NPT PLUG	P05498	2

3.5 Throttle Assembly



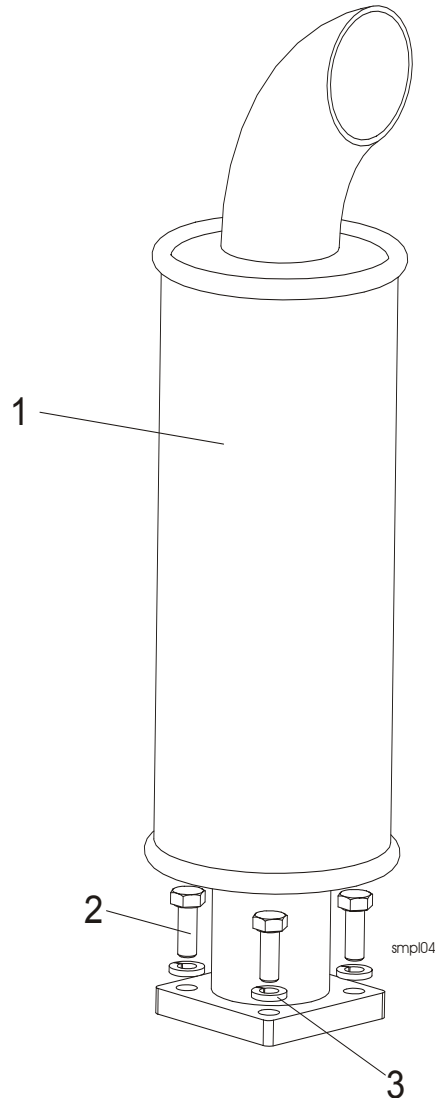
REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.
1	CABLE, KUBOTA THROTTLE	015857	1
2	Spring, Throttle	016033	1
3	BOLT, 5/16-18 X 3/4" HEX HEAD	F05006-5	1
4	NUT, 5/16-18 HEX SELF-LOCKING	F05010-20	1
5	BRACKET, LOWER THROTTLE CABLE MOUNT	015853	1
6	BOLT, M10-1.5 X 25MM HEX HEAD FULL THREAD GRADE 5	F05009-52	2
7	WASHER, 10MM SPLIT LOCK	F05011-88	2
8	BRACKET, UPPER THROTTLE CABLE MOUNT	019009	1
9	WASHER, 5/16" SPLIT LOCK	F05011-13	1
10	BOLT, M8-1.25 X 1" HEX HEAD	F05004-40	1
11	BOLT, THROTTLE CABLE	015985	1
12	WASHER, .266 X .50 X .28 AL-BRONZE	015986	1

3 Replacement Parts

Throttle Assembly

13	BOSS, 1/4 X 1/2 X .26" AL-BRONZE	016339	1	
14	WASHER, .25ID X .62OD X .06THK, PLATED	016175	1	
15	NUT, 1/4-20 NYLON LOCK	F05010-69	1	
16	NUT, 1/4-20 NYLON LOCK	F05010-69	1	
17	NUT, 5/16-18 SELF-LOCKING HEX	F05010-20	1	
18	BOLT, 5/16-18 X 1 1/4" HEX HEAD FULL THREAD	F05006-18	1	
19	NUT, 5/16-18 HEX LOCK	F05010-6	1	

3.6 Muffler Assembly

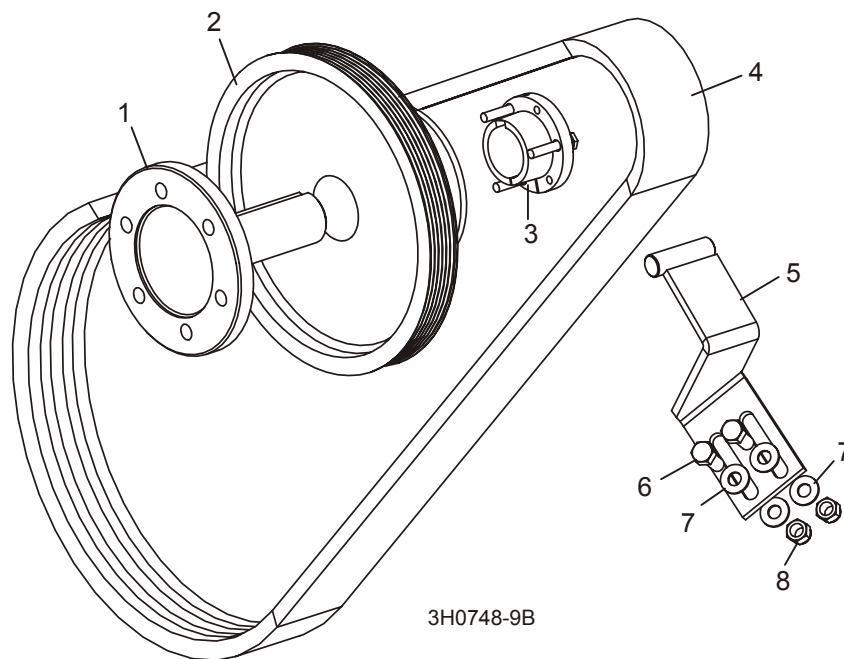


REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
1	MUFFLER, KUBOTA ENGINE	092652	1	
2	BOLT, M8X25-8.8 HEX HEAD ZINC	F81002-5	4	
3	WASHER, 8.2 ZINC SPLIT LOCK	F81054-4	4	

3 Replacement Parts

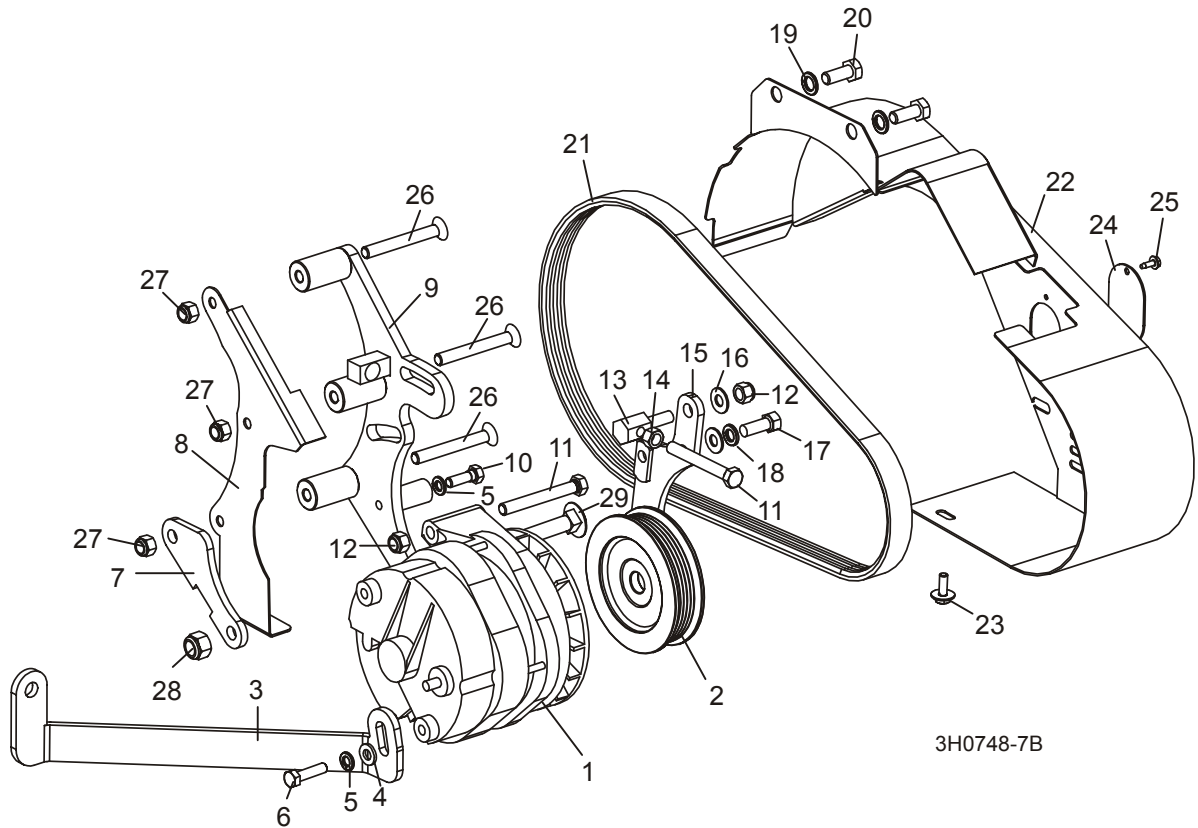
Drive Assembly

3.7 Drive Assembly



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.
1	SHAFT, KUBOTA POWER	087953	1
2	SHEAVE, 5V X 4.46" POLY V (GAS/DIESEL)	085921	1
3	BUSHING, E15 MOTOR ASSEMBLY	087066	1
4	BELT, 3BX72 DRIVE	014085	1
5	BRACKET, DRIVE BELT SUPPORT	087958	1
6	BOLT, 3/8-16 X 1" HEX HEAD	F05007-7	2
7	WASHER, 3/8" SAE FLAT	F05011-3	4
8	NUT, 3/8-16 HEX NYLON LOCK	F05010-10	2

3.8 Alternator Assembly

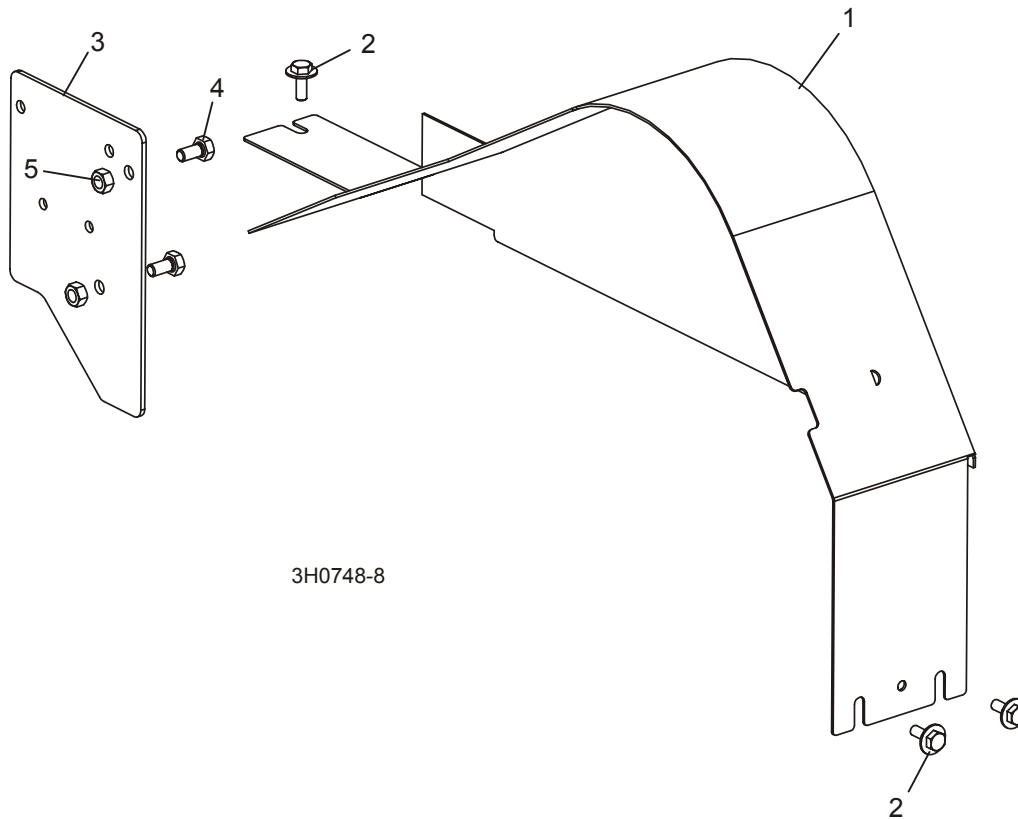


REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.	
	WIRE ASSEMBLY, 61/140 AMP ALTERNATOR PLUG	015969	1	
	ALTERNATOR ASSEMBLY, 140 AMP	023730	1	◆
1	Alternator, 140 Amp	023695	1	
2	Pulley, 140 Amp Alternator	023694	1	
3	BRACKET, ALTERNATOR SUPPORT	015923	1	
4	WASHER, 10.5 SAE FLAT	F81055-1	1	
5	WASHER, 10.2 SPLIT LOCK	F81055-2	2	
6	BOLT, M10X25 8.8 HEX HEAD	F81003-31	1	
7	PLATE, REAR ALTERNATOR MOUNT	023759	1	
8	GUARD WELDMENT, REAR ALTERNATOR	015924	1	
9	BRACKET WELDMENT, ALTERNATOR MOUNT	015872	1	
10	BOLT, 5/16-18 X 1" HEX HEAD GRADE 2	F05006-1	1	
11	BOLT, 3/8-16 X 3" HEX HEAD FULL THREAD	F05007-1	2	
12	NUT, 3/8-16 HEX NYLON LOCK	F05010-10	2	
13	STUD, ALTERNATOR BELT TENSION ADJUSTMENT	023764	1	
14	NUT, 3/8-16 HEX	F05010-1	1	
15	PLATE WELDMENT, ALTERNATOR PIVOT	015875	1	

3**Replacement Parts***Alternator Assembly*

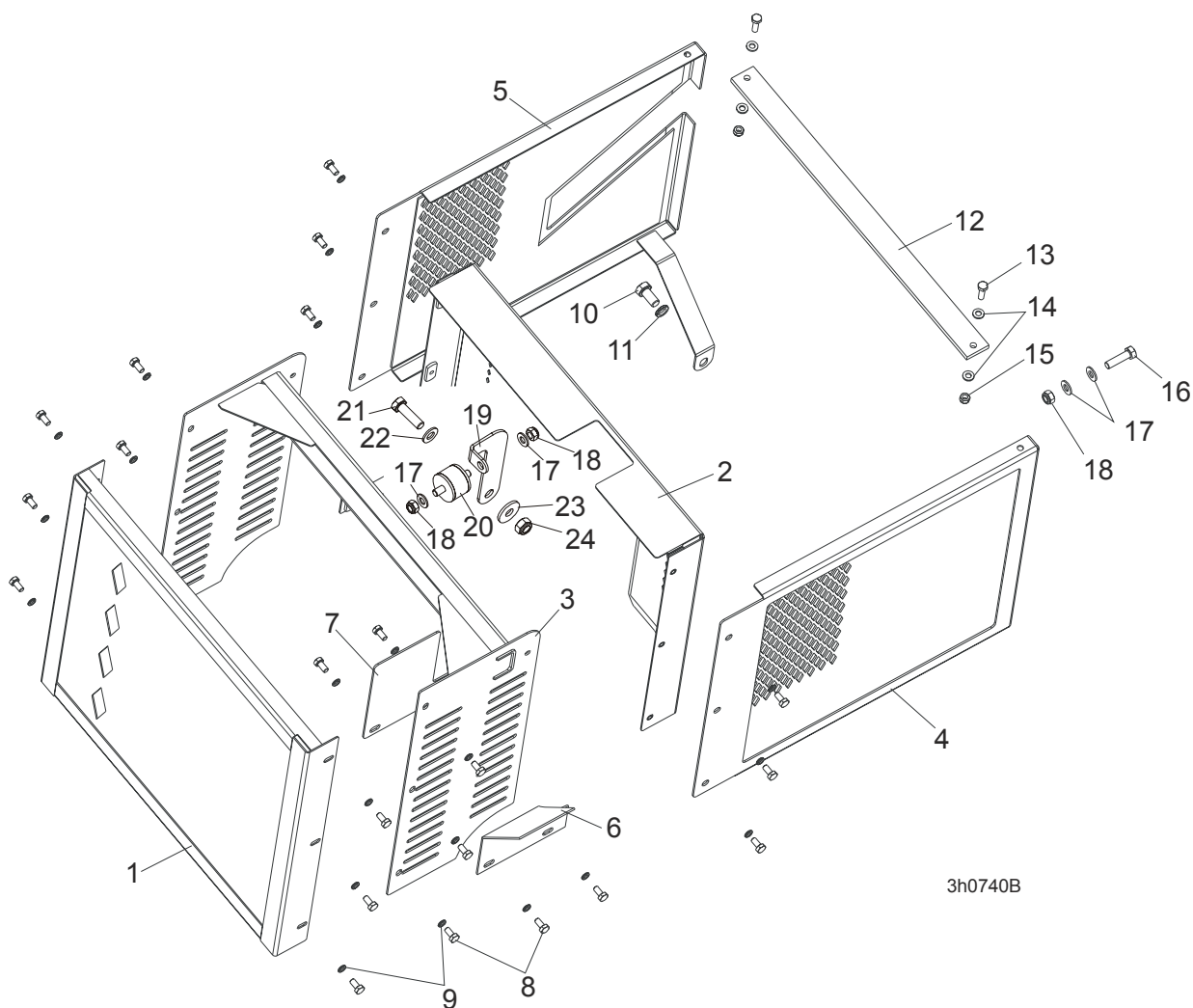
16	WASHER, 3/8" SAE FLAT	F05011-3	2	
17	BOLT, 3/8-16 X 1" HEX HEAD	F05007-7	1	
18	WASHER, 3/8" SPLIT LOCK	F05011-4	1	
19	WASHER, 10MM SPLIT LOCK	F05011-88	2	
20	BOLT, M10-1.25 X 25MM HEX HEAD	F05009-52	2	
21	BELT, 6PK1080 FIBERGLASS ALTERNATOR	088181	1	
22	GUARD WELDMENT, ALTERNATOR BELT	015830	1	
23	BOLT, 1/4-20 X 3/4" HEX CONICAL WASHER HEAD	F05005-134	1	
24	PLATE, ALTERNATOR BELT ACCESS COVER	015925	1	
25	SCREW, #10-24 X 1/2" SELF-TAPPING	F05015-7	1	
26	BOLT, M8 X 1.25 X 80MM FLAT HEAD CAP GRADE 8	F05004-169	3	
27	NUT, M8 X 1.25 FREE ZINC PLATE	F05010-162	3	
28	NUT, 3/8-16 HEX NYLON LOCK	F05010-10	1	
29	BOLT, 3/8-16 X 3 1/2" CARRIAGE HEAD BOLT	F05007-161	1	

3.9 Engine Pulley Guards



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.
1	GUARD WELDMENT, KUBOTA ENGINE PULLEY	015876	1
2	BOLT, 1/4-20 X 3/4" HEX HEAD WITH CONICAL WASHER	F05005-134	3
3	PLATE, RELAY BOX COVER	015854	1
4	BOLT, M8X125X16MM HEX HEAD	F05004-47	2
5	NUT, M8 HEX NYLON LOCK	F05010-132	2

3.10 Engine Guards



REF	DESCRIPTION (◆ Indicates Parts Available In Assemblies Only)	PART #	QTY.
1	GUARD WELDMENT, KUBOTA D33 ENGINE FRONT	090755-1	1
2	GUARD WELDMENT, KUBOTA D33 ENGINE MIDDLE	090762-1	1
3	UPPER HANDLE, RADIATOR KUBOTA D33 ENGINE	090763-1	1
4	GUARD WELDMENT, KUBOTA D33 ENGINE RIGHT	091227-1	1
5	GUARD WELDMENT, KUBOTA D33 ENGINE LEFT	091228-1	1
6	GUARD, KUBOTA RIGHT BELT	091235-1	1
7	GUARD, KUBOTA LEFT BELT	091236-1	1
8	BOLT, M6X12 HEX HEAD ZINC	F81001-7	22
9	WASHER, M6 SPLIT LOCK ZINC	F81053-3	22
10	BOLT, M10X45MM, HEX HEAD, FULL THRD, ZINC	F81003-3	1
11	WASHER, M10 SPLIT LOCK ZINC	F81055-2	1

12	BAR, KUBOTA D33 GUARD CONNECTION	091233-1	1	
13	BOLT, M6X20MM, HH, FULL THREAD, ZINC	F81001-2	1	
14	WASHER, M6, FLAT ZINC	F81053-1	2	
15	NUT, M6, HEX, NYLON LOCK ZINC	F81031-2	1	
16	BOLT, M8X30MM,HH,GR 5.8, FULL THRD,ZINC	F81002-2	1	
17	WASHER, M8, FLAT ZINC	F81054-1	4	
18	NUT, M8, HEXAGON, NYLON LOCK ZINC	F81032-2	3	
19	BRACKET, RADIATOR D33	090767-1	1	
20	BUSHING, RUBBER RADIATOR MOUNT M8	088183	1	
21	BOLT, M10X35-8.8, HEX HEAD, FULL THRD, ZINC	F81003-17	1	
22	WASHER, FLAT, M10, ZINC	F81055-1	1	
23	WASHER, FLAT, 11MM, ZINC	088787-1	1	
24	NUT, M10, NYLON HEX ZINC LOCK	F81033-1	1	

SECTION 4 ELECTRICAL WIRING DIAGRAM, D33

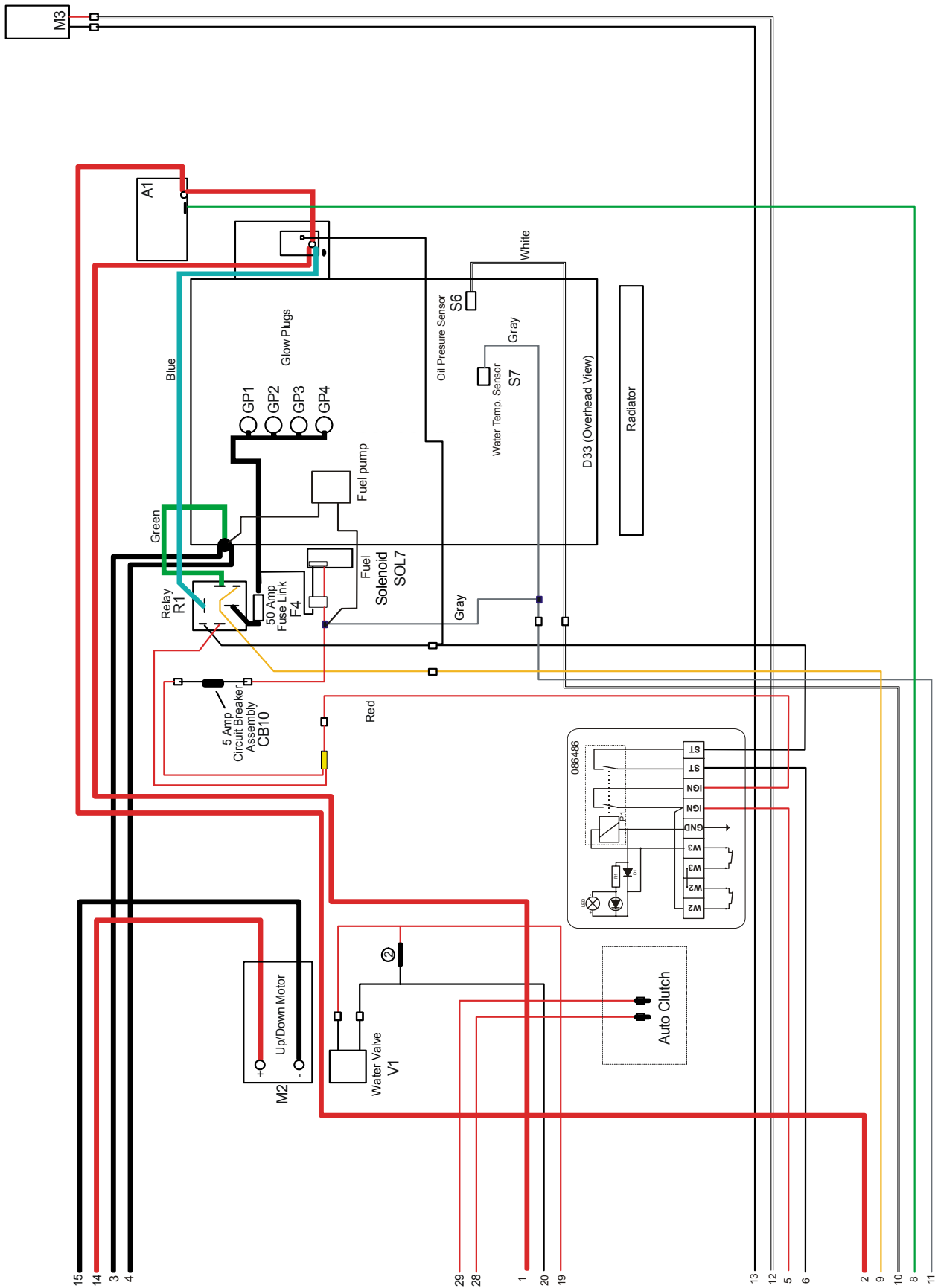


FIG. 4-1 D33 WIRING DIAGRAM PAGE 1.

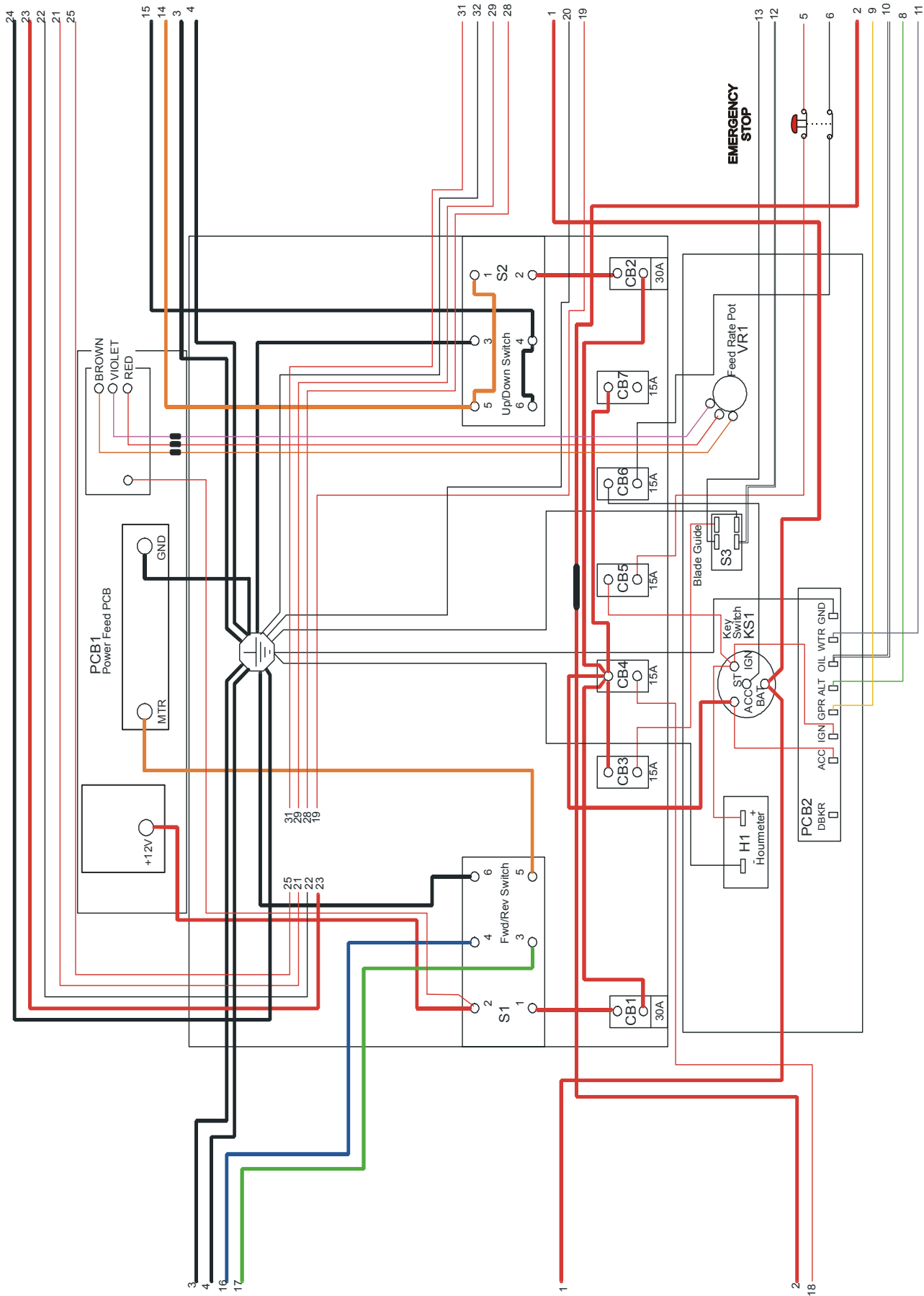


FIG. 3-1 D33 CONTROL BOX DIAGRAM PAGE 2.

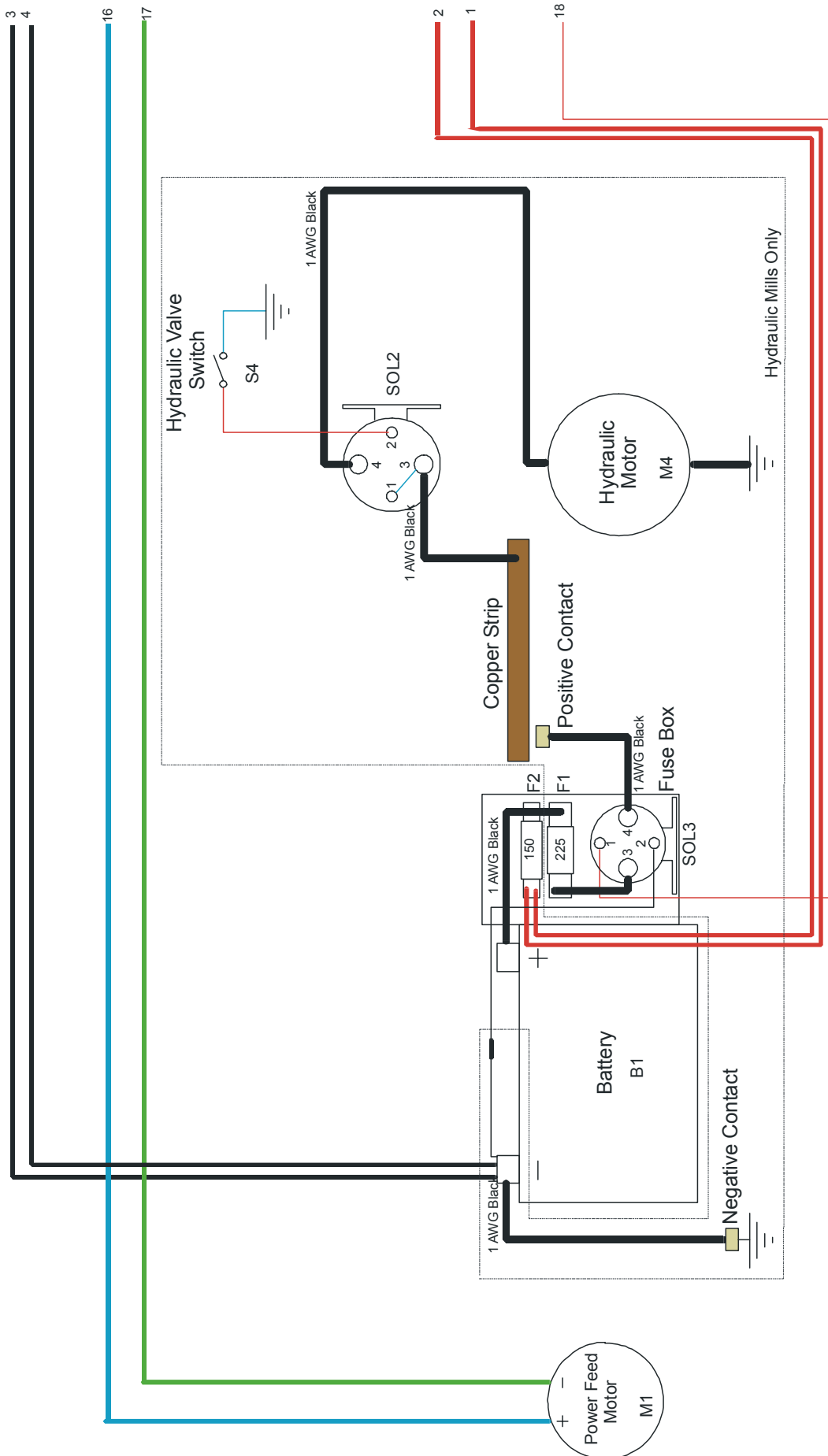


FIG. 3-1 D33 HYDRAULIC DIAGRAM PAGE 3.

Component List

Item	Mfg. Part No.	Mfg.	Wood-Mizer Part No.	Description
A1	023730	Wood-Mizer	023730	Alternator, 140 Amp
B1	95601	Banner	088322	Battery, 12 V 80Ah
CB1	1600 037 030 009	Mech. Prod.	024246	Circuit Breaker, 30 Amp, 12 V
CB2	1600-037-030-009	Mech. Prod.	024246	Circuit Breaker, 30 Amp, 12 V
CB3	CH30407-15	Cole-Hersee	E20430	Breaker, 15 Amp Manual Reset, Blade Guide
CB4	CH30407-15	Cole-Hersee	E20430	Breaker, 15 Amp Manual Reset, Accessory
CB5	CH30407-15	Cole-Hersee	E20430	Breaker, 15 Amp Manual Reset, Ignition
CB6	CH30407-15	Cole-Hersee	E20430	Breaker, 15 Amp Manual Reset, Start
CB7	CH30407-15	Cole-Hersee	E20430	Breaker, 15 Amp Manual Reset, Not Used
CB10	024453	Wood-Mizer	024453	Breaker Assy, Water Temp Max Circuit
F1 ¹	RL-225	Gould	P11550	Fuse Link, 225 Amp, 250 Volt For Hydraulic + 12 Volt Circuit
F2	RL-150	Gould	023361	Fuse Link, 150 Amp, 250 Volt For Main + 12 Volt Starter, Alt
F3	N/A	N/A	024597	Fuse Link, 50 Amp Kubota Glow Plug
GP1-GP4	16851-65510	Kubota	028562	Glow Plug
H1	T14BH517BC9	ENM Corp.	015401	Hour Meter, 12 Volt, Low Power T14 Series
KS1	121801	General	P04350	Key Switch, 4-position (Accessory, Off, Ignition, Start)
M1	PR4R0009Q	Owosso	014359	Motor, 12 Volt Power Feed
M2	PR-4P07Q	Owosso	P04140	Motor, 12 Volt Up/Down
M3	P09698-1	Klauber	A10365	Motor, 12 Volt Blade Guide Arm 53:1 Gear
M4 ¹	8111	Monarch Hyd.	P09955	Motor, 12 Volt Hydraulic Pump
PCB1	024458	Wood-Mizer	024458	Circuit Board, Control Box Power Feed
PCB2	089694	Wood-Mizer	089694	Board, LED Circuit (Diesel)
R1	191911261C	Bosch	088143	Relay, Glow Plug Timer
S1	2601-AF2-S11	Square D	E20439	Drum Switch, Power Feed Fwd/Reverse Motor
S2	2601-AF2-S12	Square D	E20440	Drum Switch, Up/Down Motor
S3	34-591Q	Pollak	024200	Toggle Switch, Blade Guide In/Out Motor
S4 ¹	024198	Wood-Mizer	024198	Switch, Hydraulic Pump Levers
S5	15841-39010	Kubota	028547	Switch, Oil Pressure Sensor
S6	TM9A230RQCG	Kubota	028510	Switch, Water Temp Sensor
SOL1	17454-60010	Kubota	028523	Solenoid, Fuel
SOL2, SOL3 ¹	586-902	Stancor	015470	Solenoid, 200A 12V SPST Hydraulic Pump Motor
VR1	024519	Wood-Mizer	024519	Potentiometer, Variable Resistance Power Feed

¹ Component applies to hydraulic models only.