

Warranty Flat Rates/ Failure Codes

DETROIT DIESEL

CORPORATION



Industrial 20–2000 kW Generator Sets
including Transfer Switches and Switchgear

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This manual provides flat rates and failure codes for 20-2000 kW generator sets including engines, accessories, transfer switches, and switchgear. A flat rate is the maximum time allowed for making warranty repairs. The manufacturer assigns a flat rate number to each flat rate. The manufacturer sets flat rates using facilities and equipment which any service shop should have available. You must write the flat rate number on the warranty claim form (K-1500) in the space marked *Flat Rate No.* See Figure 1-1.

If you make a repair which is not listed in the flat rates, please do the following:

- Enter a description of work completed in *Description of Work Performed* area on the warranty claim form.
- Give the appropriate failure code.
- Enter the actual time in space marked *Miscellaneous Labor Hours* on the claim form.

If you exceed an allowable flat rate time because of unforeseen circumstances, enter the actual time and

the flat rate number with an explanation of the causes in the *Description of Work Performed* area. Do not put extra time under *Miscellaneous Labor Hours*. If you need additional space for explanation, continue on the back of the form or on a separate sheet. These claims will be reviewed individually and are subject to approval by the Warranty Department.

Note: Refer to MP-5180, Warranty Policies and Procedures, Industrial Generator Sets including Transfer Switches and Switchgear, for applicable warranty policies and procedures.

In addition to the flat rate number, use a failure code. Find the appropriate code in the Failure Codes section. Enter this code on the warranty claim form (K-1500) in the space marked *Failure Code*. This failure code applies to the primary failed part and assists us in determining the mode of failure.

Note: Each flat rate time includes troubleshooting, test, and cleanup time.

Generator Set/ATS/Switchgear Warranty Claim

DO NOT FAX. Please mail this completed form

Claim Date / /	Dist. Claim No.
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This claim is subject to rejection if not received within 30 days from the repair date.

No credit will be issued unless this form is filled out in accordance to

Warranty Policies & Procedures.

Freight Charges (Invoice Attached)

Model	S/N	INDUSTRIAL	RV	CONSUMER MOBILE	MARINE	ATS	SWITCHGEAR
Spec.	Number of Hours	☐ Stock ☐ Standby ☐ Prime ☐ Mobile/Trailer	☐ Mobile ☐ Stock ☐ Private Motor Home ☐ Rental/Lease ☐ Comm/Ind ☐ Home Standby	☐ Recreational/ Private Motor Home ☐ Comm/Ind ☐ Marathon ☐ Unicorn/Mobile ☐ Stock	☐ Stock ☐ Pleasure Craft ☐ Comm/Ind ☐ Rental/Lease ☐ Repair Parts	☐ Stock ☐ Standby ☐ Prime ☐ Home Standby ☐ Other ☐ OEM	☐ Stock ☐ Standby ☐ Prime ☐ Peak Shaving ☐ Interruptible Rate ☐ Other
Engine Model*	Inservice Date / /	☐ Residential/ COMMERCIAL ☐ Stock ☐ Home Standby					
Engine S/N*	Repair Date / /						
	Failure Date / /						

Authorized	Service Center	Phone No.:
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Signature of Distributor or Dealer	
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Owner's Name (Last, First)	
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Address (Unit Location)	
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City, State, Zip Code/Country	
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Complaint	
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Cause	
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Correction	
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* Required for Engine Related Claims
** Miscellaneous Labor Hours Must be Explained

K-1500 (3/99a)

DISTRIBUTION: WHITE - Return to

CANARY - Distributor/Dealer

PINK - Dealers must forward to their Distributor

Figure 1-1 K-1500

Failure Codes

Electrical

EA	Electrically Out of Adjustment
EC	Connection Defect
EH	High Voltage
EL	Low Voltage
EO	Open
ES	Shorted
EU	Unstable Voltage
HO	High Output
LO	Low Output
NV	No Voltage
OU	No Output
PN	Pinched/Crimped
WI	Wired Incorrectly from Factory

Mechanical

BD	Binding
BT	Bent
CD	Casting Defect
CK	Cracked
LP	Loose Parts
MA	Assembled Improperly
MB	Mechanically Broken
ML	Leaking
MN	Noisy
MO	Out of Adjustment
MV	Vibration
NS	Not Sealing
PL	Plugged
ST	Sticking
SZ	Seized
TW	Twisted

Paint

PA	Adhesion
PC	Corrosion (Oxidation, Rust)
PE	Peeling Paint
PO	Overspray
PR	Runs, Sags

Packaging

CN	Concealed Damage
PM	Material

Miscellaneous

FC	Field Campaign *
FF	Fast Fax *
FM	Foreign Material
IN	Intermittent
IP	Incorrect Parts Supplied
IS	Incorrect Shipment
MP	Missing Parts
RE	Product Recall *
SB	Service/Parts Bulletin *

* When utilizing this failure code, the warranty claim must contain the corresponding number of the service bulletin, field campaign, fast fax, or product recall.

Engine/Alternator Cross-Reference

Use the following chart to determine the engine manufacturer for specific kW models.

Engine Cross-Reference Chart	
Model	Engine
Diesel engines	
20-125 kW	Perkins
20-200 kW	John Deere
130-200 kW	Detroit Diesel Series 40
200-2000 kW	Detroit Diesel
Gas engines	
20-100 kW	Ford, General Motors
125-275 kW	Detroit Diesel

Use the following chart to determine the alternator manufacturer for specific kW models.

Alternator Cross-Reference Chart	
Model	Alternator
Industrial	
20-300 kW	Kohler
300-2000 kW	Marathon

Section 1 Generator Set Accessory Flat Rates

1.1 Battery Chargers

Flat Rate Description	Flat Rate Number	Flat Rate Hours	Comments
Float/Equalize Battery Charger, 12/24 Volts DC, 10 Amp*			
AC or output cables	2505	1.00	For replacement of wall-mounted units Main or alarm, includes calibration Each, AC or DC
Ammeter or voltmeter	2495	1.25	
Charger R & R	2507	1.50	
Circuit board	2499	1.50	
Circuit board connector	2503	1.00	
Fuse holder	2497	1.00	
Lamps/bulbs	2496	1.00	
Power resistor	2501	1.50	
Replace wiring	2506	1.25	
SCR module	2498	1.50	
Terminal strip	2504	1.25	Each
Transformer	2502	1.75	
Trickle-Type Battery Charger			
AC or DC cord	2517	1.00	
Ammeter	2508	1.25	
Charger R & R	2519	1.25	
Circuit breaker	2511	1.00	
Diodes/resistors	2513	1.50	
Fuse holder	2510	1.00	
Lamp/holder	2509	1.00	
Replace wiring	2518	1.00	
Rheostat	2514	1.50	
Switch	2515	1.25	
Terminal strip	2516	1.00	
Transformer	2512	1.75	
* The float/equalize battery charger 12 volts DC, 6 amp/24 volts DC, 3 amp is not serviceable. Note: R & R means remove and replace.			

1.2 Fuel Tanks

Flat Rate Description	Flat Rate Number	Flat Rate Hours	Comments
Day Tanks*			
Control board	2521	1.50	
Control relay or wiring	2523	1.25	
Float switch	2522	1.25	
Motor or pump	2520	1.50	
Subbase Fuel and Day Tanks*			
Control relay or wiring	2806	1.25	
Float switch	2805	1.25	
Gauge sender	2807	1.25	
Motor or pump	2804	1.50	
* Supply the day tank serial number when filing the warranty. Note: See Engine Fuel System for subbase tank R & R.			

Section 2 Transfer Switch Flat Rates

2.1 Circuit Breaker/Contactor Models

Flat Rate Description	Flat Rate Number	Flat Rate Hours					
		30-104 Amps	105-225 Amps	226-400 Amps	401-600 Amps	601-1000 Amps	1001-2000 Amps
Circuit Breaker/Contactor							
Auxiliary switch	2437	1.25	—	—	—	—	—
Brake assembly	2430	—	1.25	1.25	1.25	1.25	1.25
Cam	2431	—	1.25	1.25	1.25	1.25	1.25
Circuit breaker, 2-pole	2424	2.50	2.75	3.25	3.50	4.00	8.50
Circuit breaker, 3-pole	2425	2.50	3.00	3.50	3.75	4.50	8.50
Circuit breaker, 4-pole	2426	2.50	3.25	3.75	4.25	4.75	8.50
Gear motor	2429	1.75	1.75	1.75	1.75	1.75	1.75
Load bus bar	2440	1.00	1.50	1.50	1.50	1.50	1.50
Mechanical interlocks	2438	1.50	1.50	1.50	1.50	1.50	1.50
Motor arm	2435	1.20	—	—	—	—	—
Neutral bar	2439	1.00	1.25	1.25	1.25	1.50	1.50
Nonautomatic 2- and 3-pole	2427	2.50	—	—	—	—	—
Normal limit switch	2436	1.25	—	—	—	—	—
Nylon freewheel, gear, or roller (center, spur, or idler gear)	2432	—	1.50	1.50	1.50	1.50	1.50
Nylon wheel	2434	1.10	—	—	—	—	—
Operating arm	2433	1.25	—	—	—	—	—
Transfer mechanism	2428	1.50	1.25	1.50	1.50	1.50	2.00
Controller							
Battery charger	2449	1.80	1.80	1.80	1.80	1.80	1.80
Circuit card	2444	1.50	1.50	1.50	1.50	1.50	1.50
Cranking limiter	2448	2.25	2.25	2.25	2.25	2.25	2.25
Current transformer	2452	1.30	1.30	1.30	1.30	1.30	1.30
Meters (volt, amp, or hour)	2451	1.50	1.50	1.50	1.50	1.50	1.50
Pilot lamps	2447	0.75	0.75	0.75	0.75	0.75	0.75
Plant exerciser	2450	1.80	1.80	1.80	1.80	1.80	1.80
Relays	2445	1.50	1.50	1.75	1.75	1.75	1.75
Selector switch	2446	2.00	2.00	2.00	2.00	2.00	2.00
Transformer	2441	1.75	1.75	1.75	1.75	1.75	1.75
Wiring harness plug socket	2442	1.50	1.50	1.50	1.50	1.50	1.50
Logic package, 6- and 9-card	2443	1.75	1.75	1.75	1.75	1.75	1.75

2.2 MATS Logic

Flat Rate Description	Flat Rate Number	Flat Rate Hours			Comments
		30-150 Amps	151-800 Amps	801-4000 Amps	
Accessories					
All hardware options	2808	2.00	2.00	2.00	
Bypass Isolation					
Bypass isolation handle	2811	1.00	1.00	1.00	
Bypass switch	2809	3.00	4.00	5.00	
Transfer switch fingers	2810	1.25	1.25	1.50	
Controller					
Microprocessor assembly R & R	2464	6.00	6.00	6.00	Includes setup/adjustments
Power supply circuit board R & R	2465	2.00	2.00	2.00	
Note: R & R means remove and replace.					

2.3 SATS Logic

Flat Rate Description	Flat Rate Number	Flat Rate Hours			Comments
		30-150 Amps	151-800 Amps	801-4000 Amps	
Accessories					
Accessory card	2485	1.50	1.50	1.50	Voltmeter or ammeter, each
Accessory card cage	2486	1.75	1.75	1.75	
Accessory relay or socket	2491	1.25	1.25	1.25	
Battery charger	2487	1.80	1.80	1.80	
In-phase monitor/sync check relay/load shed	2490	2.00	2.00	2.00	
Meter	2492	1.50	1.50	1.50	
Optional circuit board	2494	1.50	1.50	1.50	
Pilot lamp(s)	2493	0.75	0.75	0.75	
Plant exerciser	2488	1.80	1.80	1.80	
Selector switch	2489	2.00	2.00	2.00	
Bypass Isolation					
Bypass isolation handle	2468	1.00	1.00	1.00	
Bypass switch	2466	3.00	4.00	5.00	
Transfer switch fingers	2467	1.25	1.25	1.50	
Controller					
Control relays	2483	1.50	1.50	1.50	
Daughter logic board	2481	1.75	1.75	1.75	
Main logic board	2480	3.00	3.00	3.00	
Main wire harness	2482	5.00	5.00	5.00	
Transformer or assembly	2484	1.50	1.50	1.50	

2.4 30-4000 Amp Contactors

Flat Rate Description	Flat Rate Number	Flat Rate Hours			Comments
		30-150 Amps	151-800 Amps	801-4000 Amps	
ATS Contactor					
Auxiliary, miniature contacts R & R	2477	1.00	1.50	1.50	Adjustment
Coil clearing contact, adjust	2476	1.00	1.50	1.50	
Contactor assembly	2469	2.00	3.50	6.00	
Contactor coil	2471	1.50	1.50	2.00	
Contactor wire harness	2470	2.00	4.00	2.00	
Moveable main/arcing contacts	2478	—	1.50	2.00	
Rectifier	2474	1.00	1.00	1.00	
Resistor	2475	—	1.00	1.00	
Stationary main/arcing contact	2479	—	1.75	2.00	
Terminal bracket and lug	2472	—	1.50	1.50	
Terminal lug	2473	—	1.40	1.40	Lug only, each
Note: R & R means remove and replace.					

2.5 Model SCT/SCP/SBT/SBP Transfer Switches

Flat Rate Description	Flat Rate Number	Flat Rate Hours			Comments
		30-150 Amps	151-800 Amps	801-4000 Amps	
Accessories					
All hardware options	5308	2.00	2.00	2.00	
Bypass Isolation					
Bypass isolation handle	5309	1.00	1.00	1.00	
Bypass switch	5312	3.00	4.00	5.00	
Transfer switch fingers	5313	1.25	1.25	1.50	
DXPower 1000™ Controller					
Microprocessor assembly R & R	5293	2.00	2.00	2.00	Includes setup/adjustments
Note: R & R means remove and replace.					

Section 3 Engine Flat Rates

3.1 Detroit Diesel* 125-200 kW

Flat Rate Description	Flat Rate Number	Flat Rate Hours	Comments
Air Intake and Exhaust			
Air cleaner assembly, replace	3372	0.80	Standard
Air cleaner assembly, replace	3373	1.00	Heavy duty
Air cleaner element	2524	0.30	
Exhaust silencer R & R	2526	4.00	
Flexible exhaust connector	2525	1.50	
Cooling			
Block heater assembly R & R	2531	1.25	Tank assembly or element only
Block heater cord or thermostat	2533	1.25	
Block heater R & R	2530	2.00	Complete kit
Coolant hose	2528	0.80	
Fan blade, replace	2529	1.25	
Radiator assembly, replace	2527	3.25	
Radiator, repair	3384	2.00	
Engine Electrical			
Engine wiring harness	2540	2.00	
Magnetic pickup	1561	2.00	
Shutdown/gauge sender/switch	2538	1.50	
Engine Mounting			
Skid base R & R	2542	4.50	
Vibration isolators	2543	1.75	Each pair
Fuel			
Auxiliary fuel pump	2545	1.50	
Flexible fuel lines	2544	1.00	
Subbase fuel tank†	2546	6.00	
Starter			
Starter relay	2649	0.80	
* The Warranty Department requires that repairs made on Detroit Diesel engines be performed by an authorized Detroit Diesel service center. † Contact factory prior to performing any warranty work. Note: R & R means remove and replace.			

3.2 Detroit Diesel* 135-400 kW (Series 50/60 Gas, Series 60 Diesel)

Flat Rate Description	Flat Rate Number	Flat Rate Hours		Comments
		135-275 kW Gas	230-400 kW Diesel	
Air Intake and Exhaust				
Air inlet manifold R & R	5018	—	0.20	Each
Air inlet piping R & R	5019	—	—	
Air-to-air piping R & R	5020	—	—	
Charge air cooler R & R	5021	0.20	0.20	
Turbocharger	5022	—	—	
Exhaust manifold R & R	5023	0.30	0.30	
Exhaust manifold outlet connection R & R	5024	0.20	0.20	
Cooling System				
Belt tensioner and bracket R & R	5025	0.50	0.50	Front mounted
Pressure check cooling system	5026	0.50	0.50	
Radiator assembly, replace	5237	3.25	3.25	
Radiator, repair	5238	2.00	2.00	
Thermostat R & R	5027	0.10	0.10	
Thermostat housing seals R & R	5028	0.50	0.50	
Water pump R & R	5029	0.10	0.10	
Crankshaft, Mains, and Flywheel				
Bull gear R & R	5030	0.40	0.40	
Belt set R & R	5031	0.30	0.30	
Crankshaft oil seal front R & R	5032	0.20	0.20	
Crankshaft oil seal rear R & R	5033	0.30	0.30	
Crankshaft pulley R & R	5034	0.20	0.20	
Flywheel R & R	5035	0.70	0.70	
Flywheel housing R & R	5036	0.20	0.20	
Gear case cover R & R	5037	0.90	0.90	
Vibration damper R & R	5240	0.10	0.10	
Cylinder Head and Valves				
Breather pad R & R	5038	0.10	0.10	Each
Rocker cover R & R	5039	0.10	0.10	
Valve and injector arm assembly R & R	5040	—	0.30	
Valve and injector mechanism R & R	5041	—	0.80	
Valve springs and/or seals R & R	5042	—	—	Head installed
Engine Electrical				
Alternator bracket R & R	5145	0.40	0.40	Starter removed
Starter motor and drive assembly R & R	5146	0.20	0.20	
Starter solenoid R & R	5147	0.20	0.20	
* The Warranty Department requires that repairs made on Detroit Diesel engines be performed by an authorized Detroit Diesel service center. Note: R & R means remove and replace.				

Detroit Diesel* 135-400 kW (Series 50/60 Gas, Series 60 Diesel), continued

Flat Rate Description	Flat Rate Number	Flat Rate Hours		Comments
		135-275 kW Gas	230-400 kW Diesel	
Fuel System				
Compression test	5043	—	0.70	Three cylinders
DDEC connector R & R	5044	0.10	0.10	Each, includes R & R turbocharger boost, oil pressure, oil temperature, coolant level, air temperature, or water temperature (DDEC III) sensors.
DDEC II or DDEC III, reprogram	5045	0.50	0.50	Per module
Electronic control module R & R	5046	1.00	1.00	
Fuel filter assembly R & R	5047	—	0.30	Primary
Fuel filter assembly R & R	5048	—	0.30	Secondary
Fuel lines R & R	5049	0.20	0.20	
Fuel pump and/or coupling R & R	5050	—	0.10	
Fuel pump drive assembly R & R	5051	—	0.10	
Injector R & R	5052	—	2.50	One
Injector (overhead removed)	5053	—	0.10	Each additional
SRS or TRS assembly R & R	5054	0.10	0.10	
Subbase fuel tank R & R	5256	6.00	6.00	
Lubricating System				
Dipstick tube and adapter	5247	0.10	0.10	
Oil cooler elements R & R	5248	0.20	0.20	
Oil cooler pressure test	5249	0.60	0.60	
Oil filter adapter R & R	5250	0.20	0.20	
Oil filter elements R & R	5251	0.20	0.20	
Oil pan and gasket R & R	5252	0.20	0.20	
* The Warranty Department requires that repairs made on Detroit Diesel engines be performed by an authorized Detroit Diesel service center. Note: R & R means remove and replace.				

3.3 Detroit Diesel* 200-2000 kW (Single Bearing, Series 71, 92, and 149)

Flat Rate Description	Flat Rate Number	kW			Comments
		200-400	450-800	801-2000	
		Flat Rate Hours			
Air Intake and Exhaust					
Air cleaner element	2524	0.75	0.75	0.75	Each
Exhaust silencer	2526	1.50	2.00	2.50	Each
Flexible exhaust connector	2525	1.50	1.50	1.50	Each
Cooling					
Block heater	2530	2.00	2.50	3.00	Complete block heater kit
Block heater circulating pump	2532	—	—	1.50	
Block heater control box	2537	1.50	1.50	2.00	Complete box or circuit board
Block heater element or tank	2531	2.00	3.00	4.00	Tank assembly or element only
Block heater relay/cord	2534	1.50	1.50	1.50	
Block heater thermostat	2533	1.50	2.00	2.50	
Coolant hoses	2528	1.50	2.00	2.50	Includes drain and refill of radiator
Cooling fan	2529	3.50	4.50	6.00	Includes fan guard(s) R & R
Fan belt	2536	1.50	2.00	2.50	Includes guards R & R, tension adjustment
Fan guard	2535	1.50	2.50	3.50	
Radiator R & R†	2527	6.50	8.00	10.00	Unit-mounted radiator
Engine Electrical					
Air damper microswitch	2541	1.50	1.50	1.50	
Engine wiring harness	2540	2.50	3.00	3.50	
Senders/shutdown switches	2538	1.50	1.50	1.50	
Speed pickup	2539	2.00	2.00	2.00	Controller crank disconnect
Engine Mounting					
Skid base	2542	—	—	—	Call factory
Vibration isolators	2543	1.00	2.00	2.50	Skid to pad spring isolators (each)
Fuel					
Auxiliary fuel pump	2545	1.50	1.50	1.50	
Flexible fuel lines	2544	1.50	2.00	2.00	
Fuel filter	2548	0.20	0.20	0.20	
Fuel gauge sender	2547	1.50	1.50	1.50	For base tank
Skid base tank†	2546	6.00	9.00	12.00	
Governor					
Governor controller	3443	1.50	1.50	1.50	
Lubrication					
Flush lube oil system	4004	—	4.80	4.80	
Oil filter element R & R	4005	—	0.70	0.70	
Oil pump R & R	4003	—	14.50	14.50	Includes radiator
Starter					
Starter relay (solenoid)	2549	1.50	1.50	1.50	
* The Warranty Department requires that repairs made on Detroit Diesel engines be performed by an authorized Detroit Diesel service center.					
† Contact factory prior to performing any warranty work.					
Note: R & R means remove and replace.					

3.4 Detroit Diesel* 1250-2000 kW (Series 4000 Diesel)

Flat Rate Description	Flat Rate Number	kW				Comments
		1250	1500	1750	2000	
		Flat Rate Hours				
Air Intake and Exhaust						
Air inlet manifold R & R	5055	0.30	0.30	0.30	0.30	Each section
Air inlet manifold R & R	5056	—	—	1.40	1.40	One side complete
Air inlet manifolds R & R	5057	—	—	2.30	2.30	All
Charge air cooler assembly R & R	5058	1.90	1.90	1.90	1.90	Each
Charge air cooler mounting R & R	5059	2.50	2.50	2.50	2.50	
Charge air cooler piping seals R & R	5060	1.00	1.00	1.00	1.00	All, each bank
Charge air cooler top cover and seal R & R	5061	0.90	0.90	0.90	0.90	
Charge air piping to turbocharger R & R	5062	—	—	1.30	1.30	Each bank
Coolant piping, charge air cooler R & R	5063	—	—	1.10	1.10	Supply and return
Turbocharger R & R	5064	1.30	1.30	1.30	1.30	One
Turbocharger R & R	5065	2.60	2.60	2.60	2.60	Set of two
Turbocharger oil drain line R & R	5066	0.50	0.50	0.50	0.50	One
Turbocharger oil drain line R & R	5067	—	—	0.90	0.90	All
Turbocharger oil supply line R & R	5068	0.40	0.40	—	—	One
Turbocharger oil supply line R & R	5069	—	—	0.50	0.50	All
Exhaust crossover tube R & R	5070	—	—	0.30	0.30	One
Exhaust crossover tube R & R	5071	—	—	1.80	1.80	All
Exhaust manifold R & R	5072	0.60	0.60	0.60	0.60	One
Exhaust manifold R & R	5073	—	—	3.80	3.80	All
Exhaust manifold outlet connection R & R	5074	0.10	0.10	0.10	0.10	All, between turbochargers
Cooling System						
Belt tensioner and bracket, adjust R & R	5075	1.00	1.00	1.00	1.00	
Distribution housing R & R	5076	6.20	6.20	6.20	6.20	
Manifold, water outlet R & R	5077	—	—	0.10	0.10	
Manifold, water outlet R & R	5078	0.30	0.30	0.30	0.30	
Pressure check cooling system	5079	1.00	1.00	1.00	1.00	
Radiator, replace	5253	10.00	10.00	10.00	10.00	
Thermostat, high temperature R & R	5080	1.50	1.50	1.50	1.50	
Thermostat, low temperature R & R	5081	0.80	0.80	0.80	0.80	
Thermostat housing, high temperature R & R	5082	1.50	1.50	1.50	1.50	
Thermostat housing, low temperature R & R	5083	0.60	0.60	0.60	0.60	
Water pump, high temperature R & R	5084	1.00	1.00	1.00	1.00	
Water pump, low temperature R & R	5085	0.80	0.80	0.80	0.80	
* The Warranty Department requires that repairs made on Detroit Diesel engines be performed by an authorized Detroit Diesel service center. Note: R & R means remove and replace.						

Detroit Diesel* 1250-2000 kW (Series 4000 Diesel), continued

Flat Rate Description	Flat Rate Number	kW				Comments
		1250	1500	1750	2000	
		Flat Rate Hours				
Crankshaft, Mains, and Flywheel						
Belt set R & R	5086	2.50	2.50	2.50	2.50	Two
Dust shields, install	5087	0.60	0.60	0.60	0.60	
Crankshaft oil seal front R & R	5088	1.40	1.40	1.40	1.40	
Crankshaft oil seal rear R & R	5089	0.90	0.90	0.90	0.90	Generator removed
Crankshaft pulley R & R	5090	0.90	0.90	0.90	0.90	Generator removed
Flywheel R & R	5091	0.90	0.90	0.90	0.90	
Flywheel housing R & R	5092	3.80	3.80	3.80	3.80	
Flywheel housing inspection covers R & R	5093	0.10	0.10	0.10	0.10	
Vibration damper	5094	1.30	1.30	1.30	1.30	
Vibration damper guard	5095	0.40	0.40	0.40	0.40	
Cylinder Block, Liners, Pistons, and Rods						
Swing arm assembly R & R	5096	0.30	0.30	0.30	0.30	One
Swing arm assembly R & R	5097	1.50	1.50	2.60	2.60	All
Cylinder Head and Valves						
Push rods R & R	5098	0.10	0.10	0.10	0.10	Intake and exhaust
Rocker arm and bridge R & R	5099	0.30	0.30	0.30	0.30	One cylinder
Rocker arm and bridge R & R	5100	1.90	1.90	2.00	2.00	All
Rocker cover R & R	5101	0.30	0.30	0.30	0.30	Each
Rocker cover R & R	5102	0.40	0.40	0.60	0.60	All
SRS pulse wheel R & R	5103	5.30	5.30	5.30	5.30	
Engine Electrical						
Alternator R & R	5104	1.30	1.30	1.30	1.30	B bank
Alternator/accessory drive R & R	5105	1.00	1.00	1.00	1.00	
Starter R & R	5254	1.00	1.00	1.00	1.00	
Fuel System						
Control solenoid, high pressure pump R & R	5106	1.00	1.00	1.00	1.00	One
Coupling R & R	5107	0.60	0.60	0.60	0.60	
DDEC sensor harness R & R	5108	1.10	1.10	—	—	Two
Electronic control module	5109	1.40	1.40	1.40	1.40	One, front
Electronic control module cold plate R & R	5110	0.50	0.50	0.50	0.50	Both
Electronic control module cold plate R & R	5111	1.30	1.30	1.30	1.30	Primary
Fuel filter assembly R & R	5112	0.60	0.60	0.60	0.60	Secondary
Fuel filter elements R & R	5113	0.10	0.10	0.10	0.10	One
Fuel flow limiter valve R & R	5114	0.30	0.30	0.30	0.30	One
Fuel junction block assembly R & R	5115	0.80	0.80	0.80	0.80	
Fuel lines, high pressure pump R & R	5116	0.80	0.80	0.80	0.80	
Fuel lines, low pressure transfer pump R & R	5117	0.80	0.80	0.80	0.80	
Fuel line to injector, high pressure R & R	5118	0.30	0.30	0.30	0.30	One
Fuel line to injector, high pressure R & R	5119	1.60	1.60	2.10	2.10	All
Fuel line, return R & R	5120	0.30	0.30	0.30	0.30	One, cylinder head to return rail
* The Warranty Department requires that repairs made on Detroit Diesel engines be performed by an authorized Detroit Diesel service center. Note: R & R means remove and replace.						

Detroit Diesel* 1250-2000 kW (Series 4000 Diesel), continued

Flat Rate Description	Flat Rate Number	kW				Comments
		1250	1500	1750	2000	
		Flat Rate Hours				
Fuel System, continued						
Fuel pump and/or coupling, low pressure transfer R & R	5121	0.60	0.60	0.60	0.60	Set of two
Fuel pump assembly, high pressure R & R	5122	1.40	1.40	1.40	1.40	
Fuel pump injection pressure sensor, high pressure R & R	5123	0.10	0.10	0.10	0.10	
Fuel rail, high pressure R & R	5124	0.10	0.10	0.10	0.10	
Fuel rail, return R & R	5125	—	—	1.00	1.00	
Injector assembly R & R	5126	0.80	0.80	0.80	0.80	One
Injector assembly R & R	5127	3.30	3.30	4.30	4.30	All
Injector harness R & R	5128	0.90	0.90	—	—	One
Prime fuel system	5129	0.10	0.10	0.10	0.10	Complete
Relief valve, high pressure fuel rail R & R	5130	0.80	0.80	0.80	0.80	Flywheel removed
SRS sensor R & R	5131	0.10	0.10	0.10	0.10	
TRS sensor R & R	5132	0.10	0.10	0.10	0.10	
Temperature or pressure sensor R & R	5133	0.50	0.50	0.50	0.50	
Subbase fuel tank R & R	5258	12.00	12.00	12.00	12.00	
Lubricating System						
Dipstick tube and adapter R & R	5134	0.10	0.10	0.10	0.10	Two
Breather assembly R & R	5135	0.80	0.80	0.80	0.80	
Centrifugal filter assembly R & R	5136	0.30	0.30	0.30	0.30	
Crankcase to breather tube R & R	5137	0.10	0.10	0.10	0.10	
Element, oil cooler pressure test	5138	0.50	0.50	0.50	0.50	
Oil cooler housing and/or cores R & R	5139	1.90	1.90	1.90	1.90	Set of three
Oil distribution manifold and seal R & R	5140	—	—	0.90	0.90	
Oil filter adapter housing R & R	5141	1.30	1.30	1.30	1.30	
Oil filter bypass valve and spring R & R	5142	0.10	0.10	0.10	0.10	
Oil filter elements R & R	5143	0.60	0.60	0.60	0.60	
Oil pan and seal R & R	5144	3.10	3.10	4.10	4.10	Set of four
* The Warranty Department requires that repairs made on Detroit Diesel engines be performed by an authorized Detroit Diesel service center. Note: R & R means remove and replace.						

3.5 Ford 20-100 kW

Flat Rate Description	Flat Rate Number	kW			Comments
		20-30	31-45	50-100	
		Flat Rate Hours			
Air Intake and Exhaust					
Air cleaner assembly	2554	0.40	0.60	1.00	Standard
Air cleaner assembly	2555	1.00	1.00	1.20	Heavy duty
Air cleaner element	2550	0.10	0.10	0.10	
Exhaust manifold, dry	2552	0.75	0.75	0.75	Each
Exhaust manifold, wet	2553	1.25	1.25	1.00	Each
Exhaust silencer	2557	1.25	1.25	1.50	
Exhaust stack pipe	2558	0.25	0.25	0.50	
Flexible exhaust connector	2556	1.25	1.25	1.50	
Intake manifold	2551	0.75	0.75	0.75	
Turbocharger R & R	2559	2.25	2.25	2.25	
Camshaft and Timing Gear					
Camshaft gear and chain	2561	—	3.40	4.50	
Camshaft R & R	2560	3.00	4.80	5.60	
Cooling					
Block heater element or tank	2570	1.25	1.25	1.25	Complete kit or block heater assembly
Block heater R & R	2568	1.75	1.75	1.75	
Coolant hoses	2563	0.80	0.80	0.80	Each
Cooling fan	2565	1.50	1.50	1.50	
Heater cord or thermostat	2569	1.25	1.25	1.25	
Radiator	2566	2.50	2.50	2.75	
Radiator, repair	3387	1.50	1.50	1.50	
Thermostat/housing	2562	1.00	1.00	1.00	
V-belt	2567	0.50	0.50	0.50	
Water pump, coolant	2564	1.75	2.00	2.00	
Crankshaft, Mains, and Flywheel					
Balancer R & R	2575	—	—	—	
Crankshaft and main bearings	2571	3.80	4.60	4.40	
Crankshaft damper	2574	0.90	0.60	0.80	
Crankshaft flywheel seal	2573	2.70	0.50	2.50	
Crankshaft front cover seal	2572	3.00	2.00	2.30	
Flywheel R & R	2576	0.30	0.30	0.30	
Cylinder Block, Liners, and Pistons, Rods					
Pistons and/or rings	2577	7.00	7.50	11.50	All
Cylinder Head and Valves					
Cylinder head or gasket R & R	2583	3.70	3.10	6.10	Each head
Cylinder head retorque	2584	1.00	1.30	1.00	
Valve cover gasket or breather	2582	0.20	0.20	0.20	
Valve, grind or replace	2579	1.80	2.70	1.80	Each head
Valve push rod	2580	—	0.50	0.40	All
Valve spring or stem seal R & R	2581	1.80	2.00	2.50	All
Valve tappet, adjust	2578	0.50	1.20	—	
Note: R & R means remove and replace.					

Ford 20–100 kW, continued

Flat Rate Description	Flat Rate Number	kW			Comments
		20-30	31-45	50-100	
		Flat Rate Hours			
Engine Electrical					
Battery charging alternator	2585	1.30	1.50	1.50	
Engine wiring harness	2587	1.50	1.50	1.50	
Gauge senders/shutdown switch	2586	1.50	1.50	1.50	
Engine Mounting					
Engine R & R	2590	3.00	3.50	4.00	Per pair
Skid Base	2589	3.00	3.50	4.00	
Vibration isolators	2588	1.50	1.50	1.75	
Fuel System					
Carburetor, adjust	2592	0.30	0.30	0.30	Gasoline
Carburetor fuel shutdown solenoid	2595	0.90	0.90	0.90	
Carburetor R & R	2593	1.10	1.10	1.10	
Carburetor, rebuild	2591	1.75	1.75	2.00	Includes adjustment
Electric choke R & R	2594	0.90	0.90	0.90	
Flexible fuel line R & R	2599	0.50	0.50	0.50	
Fuel filter, gasoline	2600	0.50	0.50	0.50	Gas or gasoline
Fuel pump R & R	2596	1.25	1.25	1.25	
Gas fuel regulator/vaporizer R & R	2597	1.50	1.50	1.50	
Gas solenoid valve	2598	1.00	1.00	1.00	Test and adjustment
Governor					
Governor actuator	2603	1.25	1.25	1.50	Mechanical governor
Governor, adjust	2601	0.50	0.50	0.50	
Governor controller	2604	1.50	1.50	1.50	
Governor R & R	2602	1.50	1.50	1.50	Includes adjustment
Magnetic pickup	2605	1.50	1.50	1.50	
Ignition					
Crankshaft position sensor	2611	—	—	—	Distributorless ignition system
Ignition coil R & R	2608	1.40	1.40	1.40	DIS or distributor type
Ignition module	2609	1.50	1.50	1.50	Electronic ignition
Ignition timing	2610	0.40	0.40	0.40	Distributor type ignition
Spark plug wires	2607	0.25	0.40	0.50	Replace
Spark plugs, replace and cap	2606	0.25	0.30	0.40	
Lubrication					
Oil filter R & R	2812	0.25	0.25	0.25	
Oil pan or gasket	2613	1.60	1.90	1.70	
Oil pump, replace	2612	1.90	2.00	0.30	
Rebuild					
Major overhaul	2615	8.00	8.00	10.00	Includes valve service
Minor overhaul	2616	7.00	7.00	8.00	Excludes valve service
Short block R & R	2614	4.00	5.00	6.00	
Starter					
Starter drive R & R	2618	0.90	0.90	0.90	Testing
Starter motor R & R	2617	1.40	1.40	1.40	
Starter, rebuild	2619	1.90	1.90	1.90	Includes R & R, testing
Starter relay	2620	1.25	1.25	1.25	
Note: R & R means remove and replace.					

3.6 General Motors 30-100 kW

Flat Rate Description	Flat Rate Number	Flat Rate Hours	Comments
Air Intake and Exhaust			
Manifold/intake gasket R & R	5167	1.80	
Camshaft and Timing Gear			
Camshaft timing gear R & R	5168	3.00	
Crankshaft gear	5169	0.20	Excludes camshaft
Camshaft	5170	6.00	
Crankshaft, Mains, and Flywheel			
Bearing, crankshaft main	5171	3.40	Includes oil pan
Bearing, main	5172	0.70	One
Bearings, main	5173	2.80	All
Chain, timing, replace	5215	3.00	
Cover/gasket timing	5214	1.80	Includes balancer R & R
Crankshaft	5174	5.00	
Crankshaft gear	5216	0.20	Excludes timing
Expansion plug	5176	0.30	
Flywheel	5175	0.70	
Flywheel housing	5177	0.30	
Seal, main rear	5219	3.00	Includes oil pan
Seal, timing cover oil	5213	0.70	Includes balancer R & R
Cooling			
Block heater	5228	1.75	
Block heater element	5230	1.25	
Coolant hoses	5227	0.80	
Heater cord or thermostat	5229	1.25	
Radiator	5226	1.50	
Water pump/gasket	5225	0.70	
Cylinder Block, Liner, Pistons, and Rods			
Bearing, connecting rod	5178	3.00	One, includes oil pan
Bearing, connecting rod	5179	0.40	Each additional
Bearing, connecting rod	5180	2.80	All
Connecting rod or rings	5181	8.00	One
Connecting rod or rings	5182	10.00	Both
Connecting rings	5183	0.40	Each piston
Connecting rings	5184	2.60	All pistons
Connecting rod	5185	0.30	Each
Connecting rod	5186	2.00	All
Piston rod	5187	0.40	One
Piston rod	5188	3.00	All
Note: R & R means remove and replace.			

General Motors 30-100 kW, continued

Flat Rate Description	Flat Rate Number	Flat Rate Hours	Comments
Cylinder Head and Valves			
Balancer, harmonic	5207	0.50	
Cylinder head gasket	5194	5.00	One
Cylinder head gasket	5195	8.00	Both
Cylinder head	5196	6.00	One
Cylinder head	5197	9.50	Both
Lifter valve	5206	2.50	Includes R & R rocker
Push rod	5204	0.50	One, includes R & R rocker
Push rod	5205	0.90	Both, includes R & R rocker
Rocker arm	5189	0.40	Each
Rocker arms	5190	1.30	All
Rocker arm cover/gasket	5191	0.50	
Rocker arm balance stud valve	5192	0.50	One
Rocker arm balance stud valve	5193	0.30	Each additional
Valve, recondition	5200	2.00	One side
Valve, recondition	5201	3.50	Both
Ream/fit guides oversize	5202	0.20	
Valve, replace	5198	5.00	One
Valve, replace	5199	8.20	Both
Valve seals	5203	1.80	Includes R & R rocker
Engine Electrical			
Battery charging alternator	5231	1.50	
Engine wiring harness	5233	1.50	
Gauge senders/shutdown switch	5232	1.50	
Engine Mounting			
Engine, complete	5210	4.00	Complete
Engine, partial	5208	8.20	Partial
Engine; additional to recondition all valves/guides	5209	3.50	Additional
Skid base	5212	3.00	
Vibromounts	5211	1.50	
Lubrication			
Engine oil pump	5218	2.20	Includes oil
Oil pan and gasket	5217	2.00	Includes filter
Oil plug	5220	0.30	
Starter			
Starter drive R & R	5222	0.90	
Starter motor	5221	1.40	
Starter rebuild	5223	1.80	
Starter relay	5224	1.25	
Note: R & R means remove and replace.			

3.7 John Deere* 20-200 kW

Flat Rate Description	Flat Rate Number	kW			Comments
		20-60	70-100	101-200	
		Flat Rate Hours			
Air Intake and Exhaust					
Air cleaner assembly, replace	4259	0.30	0.70	0.80	Standard
Air cleaner assembly, replace	4513	0.50	0.90	1.00	Heavy duty
Air cleaner element, replace	4270	0.20	0.30	0.30	
Air cleaner R & R	4271	1.00	1.00	1.00	
Exhaust elbow coupling, replace	4267	0.60	0.60	0.60	
Exhaust elbow, replace	4266	0.60	0.60	0.60	
Exhaust manifold gasket, replace	4263	0.60	0.80	1.40	Transfer exhaust
Exhaust manifold, replace	4264	0.80	1.00	1.40	Elbow and turbocharger
Exhaust manifold w/turbo, replace	4265	1.80	2.00	2.20	
Exhaust silencer R & R	4274	1.25	1.50	2.00	
Flexible exhaust connector	4273	1.25	1.50	1.50	
Intake elbow and gasket, replace	4269	0.60	0.60	0.60	
Intake manifold/gasket, replace	4268	1.00	1.00	1.00	
Turbocharger/gasket, replace	4260	0.80	0.80	0.40	
Turbocharger, recondition	4261	1.80	1.80	1.80	Includes R & R
Turbocharger, recondition	4514	1.00	1.00	0.80	When already removed
Camshaft and Timing Gear					
Camshaft and cam followers	4294	6.50	7.00	3.60	R & R fuel pump, crankshaft pulley, and timing gear cover; R & R cylinder head; retorque head bolts and adjust valves
Camshaft, replace	4293	4.40	5.00	3.30	R & R front crankshaft pulley, front cover, fuel pump, bracket, valve cover, and rocker arm assembly, replace camshaft and/or gear
Rocker arm assembly, recondition	4296	1.20	1.40	0.60	Includes R & R
Rocker arm cover and/or gasket	4295	0.60	0.60	0.40	
Timing gear cover and/or gasket	4297	2.20	2.40	2.20	
Cooling					
Block heater assembly R & R	4316	1.25	1.25	1.25	Tank assembly or element only
Block heater cord or thermostat	4315	1.25	1.25	1.25	
Block heater R & R	4314	1.75	1.75	2.00	Complete kit
Coolant hose	4313	0.80	0.80	0.80	
Fan belts, replace	4303	0.60	0.60	0.60	
Fan blade, replace	4304	0.60	0.60	0.60	
Fan pulley, replace	4305	0.60	0.60	0.60	
Idler pulley, recondition	4306	0.60	0.60	—	Includes R & R; replace ball bearings, sleeve, and/or pulley
Radiator assembly, replace	4312	2.50	2.75	3.25	
Radiator, repair	5234	2.00	2.00	2.00	
Thermostats, covers, gaskets	4310	0.60	0.60	0.60	
Thermostat housing, replace	4311	0.60	0.60	0.60	
Water pump/gasket, replace	4307	1.00	1.00	1.50	Adjust fan belt
Water pump, recondition	4308	2.00	2.00	2.50	Includes R & R
Water pump, recondition	4309	1.00	1.00	1.00	When already removed
* John Deere requires that the distributor/dealer have a factory-trained technician. Note: R & R means remove and replace.					

John Deere* 20-200 kW, continued

Flat Rate Description	Flat Rate Number	kW			Comments
		20-60	70-100	101-200	
		Flat Rate Hours			
Crankshaft, Mains, and Flywheel					
Crankshaft front oil seal	4337	2.20	2.40	2.90	R & R timing gear cover and oil pan
Crankshaft idler gear/bushings	4339	2.60	2.60	—	
Crankshaft pulley R & R	4341	0.60	0.60	0.60	
Crankshaft rear oil seal	4336	0.80	0.80	1.20	
Crankshaft, replace	4335	6.50	7.00	7.50	
Flywheel housing, replace	4344	0.80	0.80	0.70	R & R flywheel and flywheel housing
Flywheel, replace	4342	0.60	0.60	0.70	Replace rod and main bearings, check and/or recondition oil pump, and make all adjustments
Flywheel ring gear, replace	4343	1.00	1.00	1.00	
Idler gear/bushings	4340	0.40	0.60	—	
Main bearings, replace	4338	2.80	3.60	4.00	
Cylinder Block, Liners, Pistons, and Rods					
Cylinder block, replace	4356	17.00	19.00	20.00	Deglaze cylinder liners and replace piston rings, all seals, main bearings, and rod bearings; transfer and/or replace all parts and assemblies and make all adjustments
Cylinder liner package	4357	6.5	7.00	8.00	
Cylinder liner packings	4358	1.00	1.00	1.00	
Cylinder liner, replace	4359	6.50	7.00	8.00	
Cylinder liner, replace	4360	1.00	1.00	1.00	
Pistons, liners, rods, replace	4371	7.50	9.50	11.90	R & R head and oil pump, replace piston rings, check and/or replace rod bearings, retorque head bolts, adjust valves
Pistons, liners, valves, crankshaft, camshaft, valves, recondition	4375	18.00	21.50	23.50	Each additional
Pistons, liners, valves, recondition	4373	11.50	13.50	14.60	R & R head and oil pump, replace rod bearings, retorque head bolts, adjust valves
Piston, replace	4361	6.00	7.00	8.80	R & R head and oil pump, check and/or replace main bearings and rod bearings, reset valves, retorque head bolts, adjust valves
Piston, replace	4362	1.00	1.00	1.00	
Piston rings, replace	4363	6.50	7.00	8.00	
Piston rings, replace	4364	1.00	1.00	1.00	
Piston, rings, valves, recondition	4372	13.50	17.50	14.60	
* John Deere requires that the distributor/dealer have a factory-trained technician. Note: R & R means remove and replace.					

John Deere* 20-200 kW, continued

Flat Rate Description	Flat Rate Number	kW			Comments
		20-60	70-100	101-200	
		Flat Rate Hours			
Cylinder Block, Liners, Pistons, and Rods, continued					
Piston, rods, liners, valves, recondition	4374	11.00	13.50	15.50	R & R head and oil pump, replace rod bearings, check and/or replace main bearings, retorque head bolts, reset and adjust valves
Piston, rods, replace	4370	8.00	10.00	11.90	R & R head, oil pump and liners, remove liner ridges and deglaze, replace piston rings, connect rod bearings, retorque head bolts, adjust valves
Rod bearings, replace	4365	1.40	1.60	1.60	R & R oil pump
Rod bearings, replace	4366	0.20	0.20	0.20	Each additional
Rod, main bearings, replace	4369	3.40	4.80	5.30	
Rod/piston pin, replace	4367	6.50	8.50	9.00	R & R head and oil pump, R & R piston and rings, remove liner ridges, deglaze liners, check and/or replace rod bearings
Rod/piston pin, replace	4368	1.00	1.00	1.00	Each additional
Short block assembly, install	4355	8.00	9.00	10.00	Transfer all parts and assemblies and make all adjustments
Cylinder Head and Valves					
Cylinder head, component exchange	4398	3.20	3.80	6.20	R & R air cleaner and bracket as one assembly, exhaust manifold with turbocharger and valve cover, adjust valves and retorque head bolts, transfer parts
Cylinder head gasket, replace	4397	2.80	3.80	4.80	R & R air cleaner and bracket as one assembly, exhaust manifold with turbocharger and valve cover, adjust valves, retorque head bolts
Valves, guides, recondition	4400	6.50	8.00	8.80	All; includes R & R, cylinder head R & R, reset valves, knurl guides
Valves, recondition	4399	6.00	7.00	7.60	R & R cylinder head, reset all valves
Valves, replace	4401	6.50	8.00	9.90	All; R & R cylinder head, reseal valves, inserts
Engine Electrical					
Battery charging alternator	4407	1.20	1.20	1.20	External mounted
Engine wiring harness	4408	1.50	1.50	2.00	
Fuel rack shutdown solenoid	5235	—	—	1.50	
Shutdown/gauge sender/switch	4409	1.50	1.50	1.50	
Engine Mounting					
Skid base	4418	3.50	4.00	4.50	Each pair
Vibration isolators	4415	1.50	1.75	1.75	
* John Deere requires that the distributor/dealer have a factory-trained technician. Note: R & R means remove and replace.					

John Deere* 20-200 kW, continued

Flat Rate Description	Flat Rate Number	kW			Comments
		20-60	70-100	101-200	
		Flat Rate Hours			
Fuel					
Flexible fuel lines	4438	1.00	1.00	1.00	Transfer pump to fuel filter Includes R & R
Fuel filter body, recondition	4419	0.60	0.60	0.60	
Fuel filter bracket, replace	4422	0.60	0.60	0.60	
Fuel filter element(s), replace	4420	0.60	0.60	0.60	
Fuel hose or tube, replace	4423	0.60	0.60	0.60	
Fuel shutoff solenoid	4431	0.60	0.60	—	Fuel filter to fuel injection pump One Each additional R & R injector pump, adjust engine timing and speed R & R, adjust engine timing and speed When already removed Adjust engine timing and speed One, includes R & R Each additional One Each additional
Fuel transfer pump, replace	4421	0.60	0.60	0.60	
Hose or tube, replace	4423	0.60	0.60	0.60	
Injector line, replace	4436	0.60	0.60	0.60	
Injector line, replace	4437	0.20	0.20	0.20	
Injector pump, adjust	4440	1.00	1.00	1.00	
Injection pump drive shaft	4429	1.20	1.20	1.60	
Injection pump, recondition	4426	6.00	6.00	6.00	
Injection pump, recondition	4427	4.60	4.60	4.60	
Injection pump, replace	4425	1.40	1.40	1.00	
Nozzles, recondition	4435	1.00	1.00	0.70	
Nozzles, recondition	4434	1.00	1.00	0.70	
Leak off line, replace	4430	0.60	0.60	0.20	One Each additional
Nozzle, replace	4432	0.60	0.60	0.30	
Nozzle, replace	4433	0.20	0.20	0.30	
Subbase fuel tank	4439	4.00	5.00	6.00	
Timing gear cover, drive gear R&R	4428	2.60	2.80	3.80	
Governor					
Engine speed, adjust	4464	0.60	0.60	0.50	Electronic governor Electronic governor With shutoff Electronic governor
Governor actuator, replace	4465	1.50	1.50	1.50	
Governor controller, replace	4466	1.50	1.50	1.50	
Governor housing cover, replace	4463	0.60	0.60	0.60	
Governor magnetic pickup, replace	4467	1.50	1.50	1.50	
* John Deere requires that the distributor/dealer have a factory-trained technician. Note: R & R means remove and replace.					

John Deere* 20-200 kW, continued

Flat Rate Description	Flat Rate Number	kW			Comments
		20-60	70-100	101-200	
		Flat Rate Hours			
Lubrication					
Engine oil cooler, replace	4482	0.60	0.60	0.60	Drain and refill engine coolant
Oil cooler, recondition	4483	1.20	1.20	1.20	Check and/or replace bypass valve and/or spring, includes R & R
Oil cooler, recondition	4483	0.60	0.60	0.60	When already removed
Oil dipstick and/or tube, replace	4473	0.60	0.60	0.60	
Oil filter elements, replace	4475	0.60	0.60	0.60	
Oil filter housing, replace	4476	0.80	0.80	0.50	
Oil filter inlet and/or gasket, replace	4474	0.60	0.60	0.60	
Oil pan and/or gasket, replace	4477	1.00	1.20	1.20	
Oil pump, replace	4478	1.40	1.60	1.60	
Oil pump, R & R and recondition	4479	1.80	2.00	2.40	
Oil pump, recondition	4480	0.60	0.60	1.40	When already removed
Oil regulator valve, recondition	4485	0.80	0.80	0.80	Includes R & R and includes R & R oil cooler
Vent hose or tube	4481	0.60	0.60	0.60	
Rebuild					
Engine, replace	4499	3.80	6.50	7.50	
Short engine, install	4500	5.20	8.60	9.60	
Starting					
Starter drive assembly, replace	4506	1.60	1.60	1.60	
Starter, recondition	4505	2.40	2.40	2.40	Includes armature, brushes, clutch, and R & R
Starter relay	4512	1.25	1.25	1.25	
Starter, replace	4503	0.60	0.60	0.60	
Starter solenoid, replace	4504	0.60	0.60	0.60	Includes R & R
* John Deere requires that the distributor/dealer have a factory-trained technician. Note: R & R means remove and replace.					

3.8 Perkins* 20-100 kW

Flat Rate Description	Flat Rate Number	kW		Comments
		20-60	70-100	
		Flat Rate Hours		
Air Intake and Exhaust				
Air cleaner assembly, replace	2624	0.30	0.70	Standard
Air cleaner assembly, replace	2625	0.50	0.90	Heavy duty
Air cleaner element	2626	0.20	0.30	
Exhaust elbow or rain cap	2621	0.50	0.50	
Exhaust silencer R & R	2622	1.25	1.50	
Flexible exhaust connector	2623	1.25	1.50	
Cooling				
Block heater assembly R & R	2630	1.25	1.25	Tank assembly or element only
Block heater cord or thermostat	2631	1.25	1.25	
Block heater R & R	2630	1.75	1.75	Complete kit
Coolant hose	2629	0.80	0.80	
Fan blade, replace	2627	1.25	1.25	
Radiator assembly, replace	2628	2.50	2.75	
Radiator, repair	3712	2.00	2.00	
Engine Electrical				
Engine wiring harness	2633	1.50	1.50	
Shutdown/gauge sender/switch	2634	1.50	1.50	
Engine Mounting				
Skid base R & R	2635	3.50	4.00	
Vibration isolators	2636	1.50	1.75	Each pair
Fuel				
Auxiliary fuel pump	2638	1.50	1.50	
Flexible fuel lines	2637	1.00	1.00	
Subbase fuel tank	2639	4.00	5.00	
Governor				
Governor actuator, replace	2640	1.50	1.50	Electronic governor
Governor controller, replace	2641	1.50	1.50	Electronic governor
Governor magnetic, replace pickup	2642	1.50	1.50	Electronic governor
Starter				
Starter relay	2643	0.80	0.80	
* The Warranty Department requires that repairs made on Perkins engines be performed by an authorized Perkins service center. Note: R & R means remove and replace.				

Section 4 Generator Flat Rates

4.1 20-300 kW

Flat Rate Description	Flat Rate Number	kW			Comments
		20-60	61-150	151-30	
		Flat Rate Hours			
Accessories					
Generator strip heater	2647	1.50	1.50	1.50	
Rodent guard	2648	0.50	0.50	0.50	
Weather housing front rear/panel	2646	1.00	1.00	3.00	
Weather housing latch	2644	0.75	0.75	0.75	
Weather housing roof	2645	4.00	5.00	12.00	
AC Generator					
Alarm horn components	2690	1.25	1.25	1.25	i.e., relay, switch, circuit board
Circuit breaker	2676	1.75	2.50	3.00	Line or safeguard
Current transformer	2685	1.75	1.75	1.75	One
Current transformer	2686	0.30	0.30	0.30	Each additional
End bearing	2674	2.50	2.50	3.50	
End bracket	2675	2.00	2.00	2.50	
Exciter field	2679	3.00	3.00	3.50	Permanent magnet or wound field exciter
Generator adapter	2683	10.50	12.50	14.50	Includes rotor/stator
Generator fan	2682	10.50	12.50	14.50	Includes rotor/stator
Heat sink assembly	2677	3.50	3.00	3.00	Includes photo board
Junction box	2684	1.00	1.00	1.25	
LED board	2687	1.75	1.75	1.75	Stationary
Photo transistor board	2688	3.50	3.00	3.00	Includes heat sink assembly
Rotor and assembly	2672	10.00	10.00	14.00	Includes stator
Rotor rectifier module	2678	3.00	—	—	
Speed sensor	2680	1.25	1.25	1.25	For crank disconnect
Speed sensor actuator cup	2681	2.00	2.00	2.00	
Stator	2673	8.00	8.00	12.00	
Voltage regulator	2689	2.00	2.00	2.00	

20-300 kW, continued

Flat Rate Description	Flat Rate Number	kW			Comments	
		20-60	61-150	151-30		
		Flat Rate Hours				
Controller						
AC interlock board	2661	1.00	1.00	1.00	Includes R & R, calibration	
Control relays	2660	1.25	1.25	1.25		
Controller, digital	3370	6.00	6.00	6.00		
Controller R & R	2649	1.00	1.00	1.00		
Controller terminal strip	2663	0.50	0.50	0.50		
Cycle crank board	2664	1.25	1.25	1.25		
Dry contact kit	2668	1.50	1.50	1.50		
Fuse holder or DC circuit breaker	2657	1.25	1.25	1.25		
Fuses	2671	0.50	0.50	0.50		Includes troubleshooting
Gauges/meters	2658	1.25	1.25	1.25		
Hourmeter	2655	1.25	1.25	1.25		
Main control board	2659	1.50	1.50	1.50		
Meter scale/fault lamps	2654	0.50	0.50	0.50		
Overvoltage board	2662	1.00	1.00	1.00		
Panel lights	2651	0.50	0.50	0.50		
Remote annunciator	2669	1.50	1.50	1.50	Assembly or circuit board	
Ribbon cable	2670	0.80	0.80	0.80		
Selector switch (volt/amp)	2653	1.75	1.75	1.75	LED indicator board 5-16 light	
Start/indicator panel	2650	1.50	1.50	1.50		Emergency stop, start/stop, etc.
Switches	2652	1.25	1.25	1.25	Battery charging or control	
Tachometer	2665	1.00	1.00	1.00		
Transformer	2667	1.75	1.75	1.75		
Voltage adjust rheostat	2656	1.00	1.00	1.00		
Wattmeter/transducer	2666	1.50	1.50	1.50		
Note: R & R means remove and replace.						

4.2 301-2000 kW

Flat Rate Description	Flat Rate Number	Flat Rate Hours			Comments	
		301-600 kW	601-800 kW	801-2000 kW		
AC Generator						
Bus bar holder	2751	1.25	—	—	Exciter field	
Current transformer	2718	2.00	2.00	2.00		
End bracket	2714	8.00	9.00	10.00		
Exciter armature	2712	6.00	6.00	6.00		
Exciter stator	2711	6.00	6.00	6.00		
Junction box	2715	6.00	7.00	8.00		
Line circuit breaker	2717	3.50	3.50	4.00		
Rectifier/diodes	2719	2.50	2.50	2.50		
Rotor bearing	2713	8.00	9.00	10.00		
Rotor/stator	2710	12.00	18.00	22.00		
Safeguard breaker	2716	1.50	1.50	1.50		
Surge suppressor	2720	2.50	2.50	2.50		
Voltage regulator	2721	2.00	2.00	2.00	Includes adjustments	
Voltage regulator accessories	2722	2.00	2.00	2.00	Paralleling module, etc.	
Controller						
AC interlock board	2703	1.00	1.00	1.00	Emergency stop, start/stop, etc.	
Control relays	2702	1.25	1.25	1.25		
Controller, digital	3371	4.00	4.00	4.00		
Controller R & R	2691	1.00	1.00	1.00		
Controller switches	2694	1.25	1.25	1.25		
Controller terminal strip	2705	0.50	0.50	0.50		
Dry contact kit	2708	1.50	1.50	1.50		
Fuse holder or DC circuit breaker	2699	1.25	1.25	1.25		
Fuse R & R	2813	0.50	0.50	0.50		Includes troubleshooting
Gauges/meters	2700	1.25	1.25	1.25		
Hourmeter	2697	1.25	1.25	1.25	Assembly or circuit board	
Main control board	2701	1.50	1.50	1.50		
Meter scale/fault lamps	2696	0.50	0.50	0.50		
Overvoltage board	2704	1.00	1.00	1.00		
Panel lights	2693	0.50	0.50	0.50		
Remote annunciator	2709	1.50	1.50	1.50		
Selector switch (volt/amp)	2695	1.75	1.75	1.75		
Start/indicator panel	2692	1.50	1.50	1.50		LED indicator board
Tachometer	2706	1.25	1.25	1.25		Includes R & R, calibration
Voltage adjust rheostat	2698	1.00	1.00	1.00		
Wattmeter/transducer	2707	1.50	1.50	1.50		
Note: R & R means remove and replace.						

Section 5 Switchgear Flat Rates

5.1 Low-Voltage Switchgear, 600 Volts or Less

Flat Rate Description	Flat Rate Number	Flat Rate Hours	Comments
Control circuit breakers/fuses	2733	1.75	Call factory
Control modules	2729	2.50	
Current transformer	2728	3.00	
Indicator lamps	2724	0.50	
Meters/gauges	2723	1.50	
Panel switches/pushbutton	2725	1.50	
Potential transformer	2727	1.50	
Power circuit breakers	2734	—	
Relay or relay socket	2730	1.50	
Selector switch	2726	2.00	
Voltage adjust rheostat	2732	1.50	
Voltage regulator	2731	1.25	

5.2 Medium-Voltage Switchgear, 601-5000 Volts

Flat Rate Description	Flat Rate Number	Flat Rate Hours	Comments
Control circuit breakers/fuses	2745	1.75	Call factory
Control modules	2741	2.50	
Current transformer	2740	4.00	
Indicator lamps	2736	0.50	
Meters/gauges	2735	1.50	
Panel switches/pushbutton	2737	1.50	
Potential transformer	2739	2.00	
Power circuit breakers	2746	—	
Relay or relay socket	2742	1.50	
Selector switch	2738	2.00	
Voltage adjust rheostat	2744	1.50	
Voltage regulator	2743	1.50	

Section 6 Industrial Rental Trailer Flat Rates

Flat Rate Description	Flat Rate Number	Flat Rate Hours			Comments
		20–60 kW	61–150 kW	151–300 kW	
Trailer*					
Axle R & R	3235	3.00	3.00	3.00	
Brake actuator R & R	3230	1.50	1.50	1.50	
Fuel filler cap R & R	3234	0.25	0.25	0.25	
Fuel gauge R & R	3232	0.50	0.50	0.50	
Fuel level switch R & R	3233	0.75	0.75	0.75	
Fuel tank housing R & R	3236	7.00	7.00	7.00	
Fuel tank trailer R & R	3237	6.00	6.00	6.00	
Jackstand R & R	3231	0.25	0.25	0.25	
Tire R & R	3229	1.00	1.00	1.00	
* Use the appropriate other sections for all other industrial rental generator set flat rates. Note:: R & R means remove and replace.					

Notes



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