Onan

RV GenSet

Standard Repair Times

HGJAA, HGJAB, HGJAC
HGJAD, HGJAE, HGJAF

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Foreword

The Standard Repair Times (SRT) in this manual represent the time required to perform service repairs on Onan Engine and Generator Sets. These times are representative of an average mechanic in a typical dealer or distributorship using the prescribed hand tools, equipment, and all available service tools and equipment required to perform quality repairs and do all necessary testing.

The use of this manual will:

- Encourage uniform terminology throughout the Cummins/Onan organization
- Standardize Repair Order job description write–ups
- Provide shop managers with a guide for establishing flat rate quotations
- Serve as a basis for Onan Corporation, Inc. to establish its warranty labor obligations

Reporting of errors, omissions, and recommendations for improving this publication is encouraged. Send your suggestions or comments to:

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GENERAL INFORMATION

Standard Repair Times (SRT) are lists of work tasks (procedures) and the time required to perform those tasks. The procedures list the work tasks required to be sure an engine or generator set is ready to return to service at the lowest possible cost to the customer. A Standard Repair Time is equitable when the repair described in the procedure can be performed in a period of time less than or equal to the standard by a journeyman mechanic after he/she has performed that repair on the same model, in the same application at least once. Those SRT that a particular mechanic performs more frequently will often require less time than the standard. Conversely, those SRT that a particular mechanic does not frequently perform may require more time than the standard. Several of the procedures may be required to accurately depict all the work actually performed to return a particular engine or generator set to service because the repair of a particular engine or generator set is often unique in light of the complaint, failure model, progressive damage, condition of the parts and customer desires. To allow for differences in the time required to perform a repair because of interference by the application, a Service Accessibility Code Scheme has been created.

Types of Standard Repair Times

There are three types of SRT. Most often at least one of each type is necessary to accurately depict the repair. The three types are:

- Administrative
- Troubleshooting
- Repair

Administrative SRT

Administrative SRT are intended to provide time to move the vehicle engine or generator set to and from the work area, fill out the repair order, record SRT used, etc. It is intended that an administrative SRT be used only once for each repair order. There are two administrative SRT found in this manual in Group 00 – Complete Engine. One of the administrative SRT is to be used when the repair takes place in a shop operated by the repairing location. The other administrative SRT is to be used when the repair takes place away from the shop operated by the repairing location (road repairs). The time for the road repair administrative SRT is greater to allow for loading and unloading tools, equipment, parts, etc. from the service truck.

Troubleshooting SRT

Troubleshooting SRT are found only in Group 00 – Complete Engine. These SRT are intended to be used when diagnosing and analyzing engine, generator set or component failures. Troubleshooting SRT are broken down in to logical numbered steps. The time for each step is cumulative with successive steps, including the time for the appropriate preceding step(s). Some troubleshooting SRT contain time to remove and install components to perform the check(s) listed. Most do not. If a troubleshooting SRT does **NOT** include required component removal and installation, it is intended that the SRT for the removal and installation of that component be in addition to the troubleshooting SRT. Refer to the following example:

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Procedure Number	Procedure Description	SRT Hours
00–055	Troubleshoot – Lubricating Oil Consumption Excessive	
	Includes:	
–01	– Check:	0.4
	– Oil consumption report	
	– For external oil leaks	
	– For overfilled oil pan	
	– Oil specifications	
	– For fuel contamination	
	– Oil change interval	
	– For engine oil in torque converter	
–02	– Perform checks in Step 01	1.0
	– Check:	
	– Oil temperature	
	– Air compressor oil consumption	
	– Turbocharger seal	
	– Crankcase blowby	

In the above example, the time required to perform the checks in Step 01 is 0.4 hour. If the problem is not located while performing the checks in Step 01, an additional 0.6 hour is allowed to perform the checks in Step 02 for a total of 1.0 hour. The total troubleshooting time appropriate is the time indicated in the column directly in line with the final step required to locate the problem. The step required to locate the problem may or may not be the last step shown in the troubleshooting SRT. Each step contains information as to which steps are included.

Repair SRT

Repair SRT make up the majority of this manual. These are the SRT that cover the actual repair work. The time shown on the same line as the SRT code and title is the total time for that SRT.

Standard Repair Combined Times

Standard Repair Combined Times (SRCT) provide for the combining of the three types of SRT under one code so that, if appropriate, the user can identify the work performed with fewer SRT codes.

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SRT CODING SYSTEM

Each SRT has a unique code so that SRT data can be computerized. The numbering system used is common to all the SRT manuals for all Onan engines and generator sets. The portion of the system shown in the manual contains three segments:

- Group Number
- Procedure Number
- Step Number

Group Numbers

Group numbers (the first two digits in the SRT code) are used to identify major engine components. The sample list below explains the group numbers used in SRT charts.

Procedure Numbers

The procedure number consists of three digits. The first digit provides guidance as to the category of the repair. The second and third digits, shown as XX in the following list, are sequential numbers or alpha letters within the category.

Group Number	Contents of Group	Specific Repair Number	Description of Category
00	Complete Engine or Genset		
01	Cylinder Block	0XX	Troubleshooting
02	Cylinder Head		ONLY in Group 00
03	Rocker Levers	1XX	Remove and Install
04	Cam Followers/Tappets	2XX	Rebuild
05	Fuel System	3XX	Replace
06	Injectors and Fuel Lines	4XX	Clean and Visually Check or Inspect for Reuse
07	Lubricating Oil System		
08	Cooling System	5XX	Machine/Ream/Dowel
09	Drive Units		Sleeve
10	Intake Air System		Modify/Cut/Lap
11	Exhaust System	6XX	Adjust/Calibrate
12	Air (Compressed) System		
13	Electrical Equipment	7XX	Test
14	Engine or Generator Set Testing		
15	Instruments and Controls		
16	Mounting Adaptations		

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Group Number	Contents of Group	Specific Repair Number	Description of Category
17	Miscellaneous	9XX	(SRCT in Group 99) General/Miscellaneous
22	Hardware		
25	Generator Components		
26	Generator Control Components		
27	Transfer Switches		
99	SRCT		

Step Numbers

While all SRT codes will contain a Group and Procedure number, only those procedures that are broken down into steps have step numbers. The step numbers are sequential within a SRT.

Manual Organization

There is an alphabetic index in the back of the manual. Within a particular group the procedures are arranged in alphabetical order by title, thus are not in code numeric order.

There is also a numerical index in which the procedures are arranged in numeric order and not in alphabetical order.

Within a procedure, the user will note that some lines are indented. This indentation is intended to indicate that the sub–tasks are part of the task under which they are indented.

Cummins/Onan SRT Objectives and Philosophy

The objective of Cummins/Onan SRT program is to provide credible and equitable labor time standards and procedures to the worldwide Cummins/Onan service network.

A SRT is credible when the procedure accurately depicts the work that **must** be performed to accomplish a quality engine or generator set repair.

A SRT is equitable when it can be performed in a period of time less than or equal to the standard by a journeyman mechanic after he/she has performed that repair at least once.

To establish credible and equitable SRT with sufficient flexibility to account for differences in complaints, failures, progressive damage, customer desires, etc., SRT have been structured using the following considerations:

- What must ALWAYS be done to the engine or generator set to perform the work.
- What MAY have to be done to the engine or generator set parts dependent on their condition.
- What MAY have to be removed to access the engine or generator set.
- How difficult it is for the mechanic to reach the engine or generator set even after the interfering application hardware has been removed.

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While the most frequent use of SRT information is the Onan Warranty System, it is Onan's intent that the SRT be applicable to repairs conducted for any customer.

As SRT's are developed, it is assumed:

- That all the required tools, equipment, and supplies are available in sufficient quantity and in operating condition.
- That required Onan Service Manuals are available to the mechanic are being used.
- That the correct parts are available when the mechanic needs them.

How Standard Repair Times are Developed

SRT's are developed from time studies conducted in the field and Onan Technical Service Personnel. Technical Service Representatives create a comprehensive list of all the work elements or tasks required to perform specific repairs. Field studies are analyzed to find these same work elements or tasks and determine the time required for each. The time for work elements or tasks that are not included in the field time studies is determined by conducting free engine or generator set studies or by estimation using similar elements from existing time studies. A time is determined for each element of the procedure. The time for all elements is then totaled to establish the total productive repair time.

Productive Repair Time

Productive Repair Time is described as the actual time involved doing productive work, such as: removing, disassembling, cleaning, inspecting, machining, installing and adjusting parts or components. In addition, the following operations are considered to be productive work for inclusion in a SRT:

- Clock on and off the job or repair order, including shift changes.
- Move vehicle, engine or generator set to and from the work area.
- Move tool box to the work area.
- Obtain tools from tool box, wipe and put away after use.
- Refer to service manuals.
- Obtain, unpack and clean replacement parts as necessary.
- Package and mark parts removed as necessary for warranty or local consumer laws.
- Operate engine or generator set to check for proper operation.
- Clean work area at completion of shift or repair.
- Properly dispose of used engine fluids such as oil and coolant.
- Write summary of work performed at completion of repair or work shift.
- Help from another mechanic (time for one man to complete the task times two).

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Time Allowances

After the total productive time is established, an additional allowance of 15 percent is added to cover the following:

- Personal time of 5 percent for:
  - Scheduled rest breaks
  - Personal phone calls
  - Restroom breaks
  - Shift changes
- Supplementary time of 10 percent to cover normal work interruptions:
  - Seized or hard turning fasteners
  - Extra time for extremely dirty equipment
  - Excessive waiting time for replacement parts
  - Brief assistance to other mechanics (less than 5 minutes)
  - Routine maintenance (not repair) of shop equipment
  - Obtain consumable supplies
  - Technical consultation with shop supervision

The following is an example of how the allowances are calculated to establish the SRT for a procedure where the productive time is 208.7 minute (3.48 hr):

Allowance Type	Allowance Percent (%)	Time (Minutes)
Productive Repair Time	100	208.7
Personal	5	10.4
Supplementary	10	20.9
TOTAL	115	240.0

Published Standard Repair Time = 4.0 hours

Work Not Included in an SRT

For almost every complete repair there will be one SRT that contains most of the work performed. This is sometimes called a base repair. For example, repairing an engine for high oil consumption often requires use of the SRT title Piston and Rings – Remove and Install. This SRT contains most of the time appropriate for the repair, so it is the base repair. There can be work required that is **not** part of this base SRT. This does not mean that the other work is non–productive, rather that other work is **NOT** required EVERY TIME the pistons and rings are removed and installed. More often than not, this other work is covered by another SRT. If the other work is **not** included in the base repair or in another SRT, the work is probably still productive work required for that particular repair.

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Non-Productive Work

Analysis of past SRT time studies reveals the following general types of work that were not considered to be productive:

- Waiting on camshaft gears to heat and cool
- Waiting on another mechanic to finish using special tools or shop equipment
- Hunting for misplaced parts
- Repairing shop equipment
- Sorting through capscrews, to find the correct length, that were all thrown together into one basket during disassembly
- Repairing customer supplied components
- Salvaging parts or tools that have been damaged from improper handling or lack of correct tools
- Clearing off tables, parts carts, parts racks etc. left dirty or loaded with parts from previous repairs on other equipment
- Rework caused by installation of incorrect parts or incorrect installation of correct parts
- Fabrication or modification of special tools or equipment because the correct tools or equipment are not available
- Visiting during non–break time
- Conducting business with tool vendors
- Waiting on other mechanics to provide required help
- Waiting on parts clerk to fill orders for other mechanics
- Unnecessary inspection of new parts
- “Hot Setting” valves and injectors when not required
- Repairs to application hardware
- Rework resulting from failure to follow recommended service practices
- Performing work that is **not** part of the repair order or helping another mechanic

Service Accessibility Codes

Service repairs are affected by engine or generator set accessibility. The more difficult the accessibility, the longer it will take to complete the tasks given in the SRT procedure. Accessibility for a particular application is determined by reviewing the application and rating the degree of difficulty for performing the 20 most common repairs. Four codes (A, B, C and D) are used to classify the degree of difficulty for the service accessibility of a specific model or type of equipment. An “A” accessibility code indicates the engine or generator set is easily accessible. A “D” code indicates the application does not make the engine or generator set as easily accessible, thus the highest degree of difficulty relative to SRT standards. A “S” code is included for special or specific repairs not covered in the other four classifications. The “R” code indicates the repair is completed with the component, engine or generator set removed from the application.

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"A" Accessibility Rating

1. Engine or generator sets mounted in equipment where 90 percent of the work can be performed while standing on the ground, shop floor, or flat work deck.
2. Engine or generator set can be accessed without removing any doors or panels.
3. Interfering application hardware can all be removed.
4. Clearance is sufficient for hands, wrenches, and drain and fill operations, making visual checks and room to stand and work.

"B" Accessibility Rating

1.]Engine or generator set mounted in equipment where 70 percent of the work can be performed while standing on the ground, shop floor or flat work deck.
2. Access to the engine can be gained by removing access panels or doors.
3. On 80 percent of the operations, interfering application hardware can be removed.
4. On 80 percent of the operations, clearance is sufficient for hands, wrenches, service tools, drain and fill operations, making visual checks and room to stand and work.

"C" Accessibility Rating

1. Engine or generator set mounted in equipment where 50 percent of the work can be performed while standing on the ground, shop floor or flat work deck.
2. Access to the engine or generator set can be gained by removing the hood, structural members (bolted in) or sheet metal panels.
3. On 60 percent of the operations, interfering application hardware can be removed.
4. On 60 percent of the operations, clearance is sufficient for hands, wrenches, service tools, drain and fill operations, making visual checks and room to stand and work.

"D" Accessibility Rating

1. Engine or generator set mounted in equipment where 25 percent of the work can be performed while standing on the ground, shop floor or flat work deck.
2. Access to the engine or generator set is limited due to interference from permanently mounted structural members, sheet metal or crossmembers.
3. On 40 percent of the operations, clearance is sufficient for hands, wrenches, service tools, drain and fill operations, making visual checks and limited room to stand and work.

Standard Repair Combined Times (SRCT)

SRCT's are the combination of some of the SRT's in the manual within a distinctive code. These SRCT's are based on field input of SRT's that are most frequently used in combination to describe the most common field repairs on this engine.

Use of SRCT's can reduce the amount of time required to determine the labor standard for a specific complete engine or generator set repair. The use of SRCT will also reduce the number of codes required when completing a warranty claim or customer invoice.

SRCT's are intended to supplement, NOT replace, SRT's. One SRCT code can be used instead of several SRT codes.

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It is intended that other appropriate SRT can be used to supplement a SRCT as long as the work does not overlap. If there is overlapping work, do **not** use a SRCT.

How To Use This Manual

1. Determine the actual work performed:

– Obtain this information from the work description on the repair order.

2. Determine the Accessibility Code:

– Determine the application from the repair order.

– Look in the “Accessibility Code Listing” on page to determine the accessibility code for the application involved in the repair. If the application is not shown, assume the accessibility code is “B”.

– Write down the code.

3. Determine applicable SRCT:

– Find the Contents Page for Group 99 – Standard Repair Combined Times.

– Compare the titles to the work performed to determine if a SRCT will apply.

– If there is a SRCT that seems to apply, find that SRCT and compare the SRT within the SRCT to the work performed. If you are not sure of the work included in the SRT, read that SRT and compare the procedure listing with the work performed.

– If a SRCT applies to all or part of the work performed, find the column that contains the same accessibility code determined in Step 2 above.

– Move down the column to the line containing the SRCT code and title and pick out the appropriate time.

– If all the work in the SRCT is performed and additional steps were taken, use the SRCT and continue to Step 4 to cover the additional work.

– If there is NOT an appropriate SRCT, move to Step 4.

4. Determine the appropriate repair SRT:

– Use the information from the repair order to identify the parts involved.

– Use the contents page at the front of the manual or the alphabetical index in the back of the manual to determine the appropriate SRT group for the parts and/or work involved.

– Find the contents page for that group.

– Read the contents page for procedure titles that seem to correspond to the work performed.

– Find the SRT within the group.

– Read the SRT procedure listing to determine the work included.

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– If the work performed and the work included in the SRT are the same, all or in part, determine and record the time.

– Repeat the steps in this paragraph until you have determined a SRT for all the work performed.

5. Determine the appropriate troubleshooting SRT:

– Read the repair order to determine what troubleshooting work was performed.

– Find the contents page for Group 00.

– Read the contents page for procedure to determine the work included in each step.

– If the work performed and the work included in the troubleshooting SRT are the same, all or in part, determine and record the time of the SRT step. Remember that troubleshooting SRT are cumulative.

6. Determine the appropriate miscellaneous SRT:

– Read the repair order to determine if any application hardware was removed and installed in order to access the engine or generator set.

– Find the contents page for Group 17.

– Read the contents page for procedure titles that seem to correspond to the work performed.

– Find the SRT within the group.

– Read the SRT procedure to determine the work included in the SRT.

– If the work performed and the work included in the SRT are the same, all or in part, determine and record the time.

– If the work required to application hardware is not given in the SRT manual, determine the time for ONLY this work from the repair order. Record the time for possible use as “99–999” or “Non–SRT Time”.

7. Determine the appropriate administrative SRT:

– Both of the administrative SRT are shown at the beginning of Group 00.

– Determine the appropriate SRT.

– Record the time.

8. Determine the total appropriate SRT time:

– Check to be sure that there is no duplication of tasks within the SRT procedures selected. If there is work duplicated by some of those selected, use other information contained in the manual to reduce the time of one of the SRT accordingly. If the information is not available, make an estimate.

– Total all the times obtained during performance of Steps 2 through 7.

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Standard Repair Times Review Procedure

Onan Corporation makes every effort to be sure the SRT published in this manual are credible and equitable. It will be necessary to review the published times when one or more of the following changes occur:

- Design changes to special service tools or equipment required to perform the repair
- Changes to the repair procedure

A formal SRT review procedure is available for any Cummins/Onan Authorized Repair Location that believes the SRT shown in this manual are incorrect.

To be sure prompt attention and an accurate appraisal is given to your request, the following guidelines must be met:

1. Be sure the technician has followed all the procedures and used all the service tools referred to in the appropriate service manuals.
2. Be sure a journeyman technician performed the repair, one who has completed the repair a sufficient number of times to become familiar with the procedure.
3. Be sure all the SRT, including supplemental SRT, appropriate for the repair are being used.
4. Include as much detail as possible about the specific repair.

NOTE: It is **NOT** the intent of this procedure to provide a forum for appealing or disputing the amount of time or the SRT judged appropriate on a particular warranty claim. Communication of this sort **must** follow the processes shown in the Onan Warranty Administration Manual.

5. Provide photographs of the installation.
6. Provide copies of all repair orders applicable to the SRT involved, the technicians time cards, and any other information related to the repair that will aid in the review process.
7. Be sure to provide the correct name of the repairing location, a phone number, and point of contact.

Company Action

Upon receipt of the request for an SRT review, the following action will be taken:

1. The person signing the request will be contacted to acknowledge the receipt of the request.
2. All the information provided will be analyzed and compared with the history files of the specific operation.
3. All information will be analyzed to determine if an error has been made in the procedure, the operations description, or the published repair time.
4. If it is determined the published repair time is incorrect, additional studies/analysis will be performed to establish the correct time. The requester will be notified of the results, and the results will be published in the next SRT update.
5. If it is determined that the time and procedure is correct, recommendations and assistance will be offered as needed.

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Group 00 – Complete Engine

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–901 Administrative Time – Open/Close Repair Order *Includes:* – Clock on and off the job – Move equipment to and from work area – Clean work area and write repair at the end of each shift and when job has been completed – Record the following: – Generator Set Model Number – Generator Set Serial Number – Customer name and address – Original date of purchase – Hours of operation	0.4	-	-	-	-	-
00–0AA Troubleshoot – Engine Will Not Crank (Genset) *Includes:* 01 Check: – Battery condition – Battery connections – loose or dirty – Battery cable size – Evaluate Fault Codes	-	-	0.3	-	-	-
02 Perform checks in step 01 and Check: – Starter – Start/Stop switch – Remote connections – Start solenoid – Control – Engine wiring harness – Connections on PCB assembly	-	-	0.5	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–0AB Troubleshoot – Engine Starts But Stops After Running for Several Seconds (Genset) Check: – Engine speed – Fuel level – Control – Evaluate fault codes if present	-	-	0.3	-	-	-
00–0AD Troubleshoot – High/Low AC Output (Genset) *Includes:* 01 Check: – Load Balance – Broken or loose wires – Output lead wiring configuration – Control – Voltage adjustment pot (if equipped) – Evaluate fault codes (if present)	-	-	0.5	-	-	-
02 Perform checks in step 01 – Check: – Main rotor – Main stator	-	-	1.0	-	-	-
00–0AG Troubleshoot – No AC Output (Genset) *Includes:* 01 Check: – Load breakers closed – Broken or loose wires – Output to load breakers – AC output – Brushes – Evaluate fault codes if present	-	-	0.3	-	-	-

(continued on next page)

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–0AG Troubleshoot – No AC Output (Genset)						
02 Perform checks in step 01 – Check: – Field Flash – Control – Output from avr to brushes	-	-	0.6	-	-	-
03 Perform checks in step 02 – Check: – Rotor winding resistance & grounds – Quad winding resistance & grounds – Stator winding resistance & grounds	-	-	1.0	-	-	-
00–022 Troubleshoot – Engine Cranks But Will Not Start (Genset) *Includes:*						
01 Check: – Battery condition	-	-	0.1	-	-	-
02 Perform check in step 1 and include – Check: – Fuel supply – Restricted air supply – Governor actuator – Fuel supply fittings – Fuel pump – Magneto wiring – Control – Ignition	-	-	0.9	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–041 Troubleshoot – Engine Unstable (Genset Hunts) *Includes:* 01 Check: – Fuel Supply – MAT – MAP – Fuel lines for leakage – Loose wiring connections	-	-	0.5	-	-	-
02 Perform checks in step 01 – Check: – Governor linkage for binding – Governor actuator – Stator resistance for open/shorts/grounds – Rotor resistance for open/shorts/grounds – Governor adjustments	-	-	0.8	-	-	-
00–0CM Troubleshoot – Engine Oil Leak *Includes:* – Clean contaminated area – Add oil dye to oil – Run engine and check for leaks	-	-	0.5	-	-	-
00–OCF Troubleshoot – Fault Code 2 (Low Oil Pressure) Check: – Oil level – Oil pressure lead connection – Oil pressure switch – Control – Engine oil pressure	-	-	0.5	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–OCG Troubleshoot – Fault Code 4 (Over Crank) Check: – Fuel level/supply – Spark – Battery level – Control	-	-	0.3	-	-	-
00–0BD Troubleshoot – Fault Code 12 (Over Voltage) Check: – Output voltage – Control	-	-	0.3	-	-	-
00–OBE Troubleshoot – Fault Code 13 (Under Voltage) Check: – Loads – Control	-	-	0.3	-	-	-
00–OBF Troubleshoot – Fault Code 14 (Over Frequency) Check: – Engine speed – Control – Governor linkage – Governor actuator	-	-	0.3	-	-	-
00–OBG Troubleshoot – Fault Code 15 (Under Frequency) Check: – Engine speed – Control – Drive belt – Governor linkage – Excessive loads – Governor actuator	-	-	0.3	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–OBH Troubleshoot – Fault Code 17 (Fuel Pump) Check: – Fuel pump wiring – Fuel pump – Fuel system – Control	-	-	0.5	-	-	-
00–0BJ Troubleshoot – Fault Code 19 (Actuator Open/ Shorted) *Includes:* Check: – Actuator wiring – Actuator – Control	-	-	0.5	-	-	-
00–OBL Troubleshoot – Fault Code 22 (Actuator Overload) *Includes:* 01 Check: – Load – Air intake restriction or dirty air filter – Exhaust restriction – Governor actuator – Air leak in fuel system	-	-	0.3	-	-	-
02 Perform checks in 01 – Check: – Fuel flow – Injectors – Control – Compression	-	-	1.5	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–0BM Troubleshoot – Fault Code 23 (Oil Pressure Switch) Check: – Oil level – Oil pressure – Oil switch wire – Oil switch – Control	-	-	0.5	-	-	-
00–0BN Troubleshoot – Fault Code 24 (Engine Temp) Check: – Engine temp wiring – Engine temp sensor – Engine control	-	-	0.5	-	-	-
00–OBU Troubleshoot – Fault Code 27 (Loss of AC Sense) Check: – Wiring from generator to control – Generator stator – Generator rotor – Control – External shorts	-	-	0.5	-	-	-
00–OBR Troubleshoot – Fault Code 29 (High Battery Voltage) Check: – Battery connections – Battery charge rate – Control – Battery condition	-	-	0.3	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–OBV Troubleshoot – Fault Code 32 (Starter Fault) Check: – Battery voltage – Battery condition – Battery connections – External loads – Broken belt – Wiring Harness – Field Flash – Quad Windings – Control – Starter	-	-	1.0	-	-	-
00–0CA Troubleshoot – Fault Code 35 (EE Checksum Fault) Check: – Control	-	-	0.3	-	-	-
00–OBW Troubleshoot – Fault Code 36 (Engine Stopped) Check: – Fuel level – Governor operation – Spark – Loads are too heavy – Control	-	-	0.3	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–0CH Troubleshoot – Fault Code 37 (Invalid Set Configuration) *Includes:* Check: – Engine speed – Remove and Reinstall: – Generator frequency – Control – Broken Belt	-	-	1.0	-	-	-
00–OBX Troubleshoot – Fault Code 38 (Field Overload) Check: – Intake/Exhaust restrictions – Control – Iced or corroded brushes – Rotor resistance for open/short/ground – Power factor of coach loads	-	-	0.5	-	-	-
00–0CI Troubleshoot – Fault Code 41 (Field Flash) Check: – Battery and battery voltage – Brushes – Control – Field windings	-	-	1.0	-	-	-
00–0CB Troubleshoot – Fault Code 42 (Processor Fault ROM) Check: – Control	-	-	0.3	-	-	-
00–0CC Troubleshoot – Fault Code 43 (Processor Fault RAM) Check: – Control	-	-	0.3	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–0BY Troubleshoot – Fault Code 45 (Zero Cross Sense Loss) Check: – Field flash – Rotor resistance for open/shorts/grounds – Brushes – Quad winding – Quad wiring – Control	-	-	0.8	-	-	-
00–0BZ Troubleshoot – Fault Code 46 (Open/Shorted Field) Check: – Brushes – Rotor windings – Control	-	-	1.0	-	-	-
00–OCE Troubleshoot – Fault Code 47 (Loss of Ignition Sense) Check: – Spark – Magneto wiring – Control	-	-	0.5	-	-	-
00–OCD Troubleshoot – Fault Code 48 (Loss of Field Voltage Sense) Check: – Control	-	-	0.5	-	-	-
00–0CJ Troubleshoot – Fault Code 52 (Injector Open/ Shorted) Check: – Injector – Injector wiring – Control	-	-	0.8	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–0CK Troubleshoot – Fault Code 54 (MAT Sensor) Check: – MAT wiring – MAT sensor – Control	-	-	0.5	-	-	-
00–0CL Troubleshoot – Fault Code 56 (MAP Sensor) Check: – MAP wiring – Control – MAP sensor	-	-	0.5	-	-	-
00–101 Engine – Remove and Install *Includes:* Disconnect and connect: – Fuel lines – Wiring harnesses Drain and refill engine fluids Remove and install: – Drip pan assembly – Sound shield – Starter – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Belt, pulley, and coupling – Exhaust manifold and gaskets – Engine sheet metal – Engine/generator bracket – Air cleaner and housing assembly – Governor spring and arm – Intake manifold, gaskets & carb assembly – Oil filter, Lopko switch and oil drain assy. *(continued on next page)*	-	-	3.0	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–101 Engine – Remove and Install – Engine from base plate Refill oil Test run genset	-	-	3.0	-	-	-
00–112 Crankshaft – Remove and Install *Includes:* Disconnect and connect: – Wiring harness – Fuel lines Drain and refill engine fluids Remove and install: – Drip pan assembly – Sound shield – Engine wiring harness – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly & belt – Exhaust manifold & gaskets – Engine sheet metal – Engine/generator bracket – Engine/generator base plate – Air cleaner or silencer assembly – Governor spring – Intake manifold, gaskets & carb assembly – Valve covers, gaskets & rocker arm assembly – Tappets – Cylinder heads & gaskets – Oil pan assembly & gasket – Oil pump – Connecting rod bearings *(continued on next page)*	-	-	7.2	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–112 Crankshaft – Remove and Install – Piston & connecting rod assembly – Main bearings – Crankshaft – Adjust valve lash – Clean and inspect cylinder bores Test run genset	-	-	7.2	-	-	-
00–201 Engine Block – Rebuild *Includes:* Disconnect and connect: – Fuel lines – Wiring harnesses Drain and refill engine fluids Remove and install: – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly and belt – Exhaust manifold & gaskets – Engine sheet metal – Engine/generator bracket – Engine/generator base plate – Air cleaner and housing assembly – Governor spring and arm – Intake manifold, gaskets and carb assy. – Valve covers, gaskets and rocker arm assy. – Tappets – Cylinder heads and gaskets – Oil pan assembly and gasket – Oil pump *(continued on next page)*	-	-	10.0	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
00–201 Engine Block – Rebuild – Connecting rod bearings – Piston & connecting rod assembly – Main bearings – Crankshaft – Camshaft – Oil seals – Hone or bore cylinder – Adjust valve lash Test run genset	-	-	10.0	-	-	-
00–1AA Generator Set, Mobile – Remove and Install *Includes:* Disconnect and connect: – Battery cables – Main leads and associated wiring – Fuel lines – Exhaust systems Remove and install: – Generator from mounting location Test run for proper operation	-	-	2.0	-	-	-

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Group 01 – Cylinder Block

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
01–3AC Piston Rings – Remove and Install (New) *Includes:* Disconnect and connect: – Fuel lines – Wiring harnesses Drain and refill engine fluids Remove and install: – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly & belt – Exhaust manifold & gaskets – Engine sheet metal – Engine/generator bracket – Engine/generator base plate – Oil pan assembly & gasket – Air cleaner and housing assembly – Governor spring and arm – Intake manifold, gaskets & carb assembly – Valve covers, gaskets & rocker arm assembly – Tappets – Cylinder heads & gaskets – Connecting rod bearings – Piston & connecting rod assembly Clean and visually inspect crankshaft – Hone/clean cylinders – Adjust valve lash – Test run genset	-	-	7.5	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
01–3AE Camshaft – Replace *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly & belt – Exhaust manifold & gaskets – Engine sheet metal – Engine/generator bracket – Engine/generator base plate – Oil pan assembly & gasket – Air cleaner and housing assembly – Valve covers & gaskets – Rocker arms – Cam shaft assembly Clean and visually inspect crankshaft – Adjust valve lash – Test run genset	-	-	5.1	-	-	-
01–3AF Connecting Rod Bearings – Remove and Install *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines Drain and refill engine fluids *(continued on next page)*	-	-	7.2	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
01–3AF Connecting Rod Bearings – Remove and Install Remove and install: – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly & belt – Exhaust manifold & gaskets – Engine sheet metal – Engine/generator bracket – Engine/generator base plate – Oil pan assembly & gasket – Air cleaner and housing assembly – Governor spring and arm – Connecting rods, cap bolts and bearings Clean and visually inspect – Crankshaft Test run unit	-	-	7.2	-	-	-
01–114 Gear, Crankshaft – Remove and Install *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines Drain and refill engine fluids Remove and install: – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly & belt *(continued on next page)*	-	-	6.5	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
01–114 Gear, Crankshaft – Remove and Install – Exhaust manifold & gaskets – Engine sheet metal – Engine/generator bracket – Engine/generator base plate – Oil pan assembly & gasket – Air cleaner and housing assembly – Crankshaft gear Clean and visually inspect – Crankshaft Test run genset	-	-	6.5	-	-	-
01–140 Piston Assembly – Remove and Install *Includes:* Disconnect and connect: – Wiring harnesses – Fuel lines Drain and refill engine fluids Remove and install: – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly and belt – Exhaust manifold & gaskets – Engine sheet metal – Engine/generator bracket – Engine/generator base plate – Oil pan assembly & gasket – Air cleaner and housing assembly – Governor spring and arm – Intake manifold, gaskets & carb assembly *(continued on next page)*	-	-	7.4	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
01–140 Piston Assembly – Remove and Install – Valve covers, gaskets – Cylinder heads & gaskets – Connecting rod bearings – Piston & connecting rod assembly Clean and visually inspect – Crankshaft – Hone/clean cylinders – Adjust valve lash Test run genset	-	-	7.4	-	-	-
01–304 Crankshaft Seal, Front (Bottom) – Replace *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines Drain and refill engine fluids Remove and install: – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly and belt – Crankshaft seal Clean and visually inspect – Crankshaft Test run genset	-	-	2.0	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
01–308 Crankshaft Seal, Rear (Top) – Replace *Includes:* Remove and install: – Sound shield – Hydraulic pump (if equipped) – Top bearing cover – Crankshaft oil seal Clean and visually inspect – Crankshaft Test run genset	-	-	1.0	-	-	-

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Group 02 – Cylinder Head

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
02–3AA Cylinder Head Gasket – Replace *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly and belt – Exhaust manifold & gaskets – Engine from mounting plate – Engine sheet metal – Air cleaner and housing assembly – Governor spring and arm – Intake manifold/carb assembly/gaskets – Valve cover, gaskets & rocker arm assembly – Cylinder heads & head gasket – Adjust valve lash Test run genset	-	-	6.0	-	-	-
02–104 Cylinder Head – Remove and Install *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield *(continued on next page)*	-	-	6.0	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
02–104 Cylinder Head – Remove and Install – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly/belt/rotor drive pulley – Exhaust manifold & gaskets – Engine from mounting plate – Engine sheet metal – Air cleaner and housing assembly – Governor spring and arm – Intake manifold/carb assembly/gaskets – Valve cover, gaskets & rocker arm assembly – Cylinder heads & gaskets – Adjust valve lash Test run genset	-	-	6.0	-	-	-
02–302 Valve Guides – Replace *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly and belt – Exhaust manifold & gaskets – Engine from base plate – Engine sheet metal – Air cleaner and housing assembly	-	-	6.3	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
02–302 Valve Guides – Replace – Governor spring and arm – Intake manifold/carb assembly/gaskets – Valve cover, gaskets & rocker arm assembly – Cylinder heads & gaskets – Valves – Valve guides – Adjust valve lash Test run genset	-	-	6.3	-	-	-
02–513 Valves – Grind *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly and belt – Exhaust manifold & gaskets – Air cleaner and housing assembly – Governor spring and arm – Intake manifold/carb assembly/gaskets – Valve cover, gaskets & rocker arm assembly – Engine from base plate – Engine sheet metal – Cylinder heads & gaskets – Intake & exhaust valves *(continued on next page)*	-	-	6.5	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
02–513 Valves – Grind – Grind valves – Adjust valve lash Test run genset	-	-	6.5	-	-	-

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Group 03 – Rocker Levers

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
03–603 Valves – Adjust, All *Includes:* Disconnect and connect: – Wiring harnesses – Fuel lines Remove and Install – Air cleaner & housing assembly – Valve cover & gaskets – Spark plugs – Adjust valve lash Test run genset	-	-	1.0	-	-	-
03–801 Breather Valve – Service *Includes:* Disconnect and connect – Fuel lines – Battery positive cable Remove and install: – Air filter & filter housing – Breather cover, breather & gaskets Test run genset	-	-	0.5	-	-	-

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Group 04 – Cam Follower

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
04–118 Valve Tappets – Remove and Install *Includes:* Disconnect and connect – Wiring harnesses – Battery Leads – Fuel lines Drain and refill engine fluids Remove and install – Engine wiring harness – Air cleaner assembly – Valve cover assembly & gasket – Rocker arm assembly – Tappets – Adjust valve lash Test run unit	-	-	4.0	-	-	-

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Group 05 – Fuel System

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
05–118 Carburetor/Throttle Body – Remove and Install *Includes:* Disconnect and connect: – Battery leads – Fuel lines – Air cleaner & housing assembly – Governor linkage and arm – Carburetor/throttle body mounting nuts – Electric choke leads & linkage – Carburetor/throttle body assembly & gaskets – Fuel shutoff valve & wires Test run genset	-	-	1.0	-	-	-
05–1AA Governor Controller – Remove and Install *Includes:* Remove and install – Sound shield service door Disconnect and connect: – Battery leads – Wiring harness Remove and install – Control board Test run genset	-	-	0.5	-	-	-
05–1AC Fuel Pump, Electric – Remove and Install *Includes:* Disconnect and connect: – Battery leads – Fuel lines – Pump electrical leads Remove and install – Fuel pump – Check for fuel leaks Test run genset	-	-	0.5	-	-	-

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Group 06 – Injectors

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
06–149 Injectors – Remove and Install *Includes:* Disconnect and connect – Battery leads Remove and install – Air cleaner & housing – Fuel line from fuel filter – Throttle body/mounting bolts/gasket – Fuel rail mounting bolt & clip – Fuel rail – Injector mounting bolts/leads/injector Test run genset	-	-	1.0	-	-	-
06–118 Injector Fuel Rail – Remove and Install *Includes:* Disconnect and connect – Battery leads Remove and install – Air cleaner and housing – Fuel line from filter – Throttle body/nuts/gasket – Fuel rail mounting bolt and clip – Fuel rail Test run genset	-	-	1.0	-	-	-

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Group 07 – Lubricating Oil System

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
07–109 Oil Base– Remove and Install *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly and drive belt – Exhaust manifold and gaskets – Starter – Oil filter – Pressure switch – Drain plugs – Oil pump assembly – Oil seal – Engine sheet metal – Engine/generator bracket – Engine from base plate – Oil pan assembly and gaskets Test run genset	-	-	4.0	-	-	-
07–113 Oil Pump Assembly – Remove and Install *Includes:* Disconnect and connect – Fuel lines Drain and refill engine fluids Remove and install – Drip pan assembly	-	-	1.0	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
07–113 Oil Pump Assembly – Remove and Install – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly and drive belt – Pump housing mounting bolts and housing – Oil pump Test run genset	-	-	1.0	-	-	-
07–131 Muffler – Remove and Install *Includes:* Remove and install – Muffler – Exhaust lines to muffler – Tail pipes – Hanger brackets & clamps Test run and check for leaks	-	-	0.5	-	-	-
07–301 Oil Filter – Replace *Includes:* – Remove: – Oil filter – Fill new filter with oil – Lubricate filter seal – Install new oil filter – Check oil level Test run and check for leaks	-	-	0.1	-	-	-
07–801 Lubricating Oil & Filter – Change *Includes:* – Drain and fill oil base – Remove: – Oil filter *(continued on next page)*	-	-	0.5	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
07–801 Lubricating Oil & Filter – Change Install: – New filter – Fill filter with oil – Lubricate filter seal Test run and check for leaks	-	-	0.5	-	-	-

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Group 08 – Cooling System

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
08–114 Cooling Fan – Remove and Install *Includes:* Disconnect and connect: – Wiring harnesses – Drain and refill engine fluids Remove and install: – Drip pan assembly – Sound shield – Cooling air duct assembly – Fan assembly Test run genset	-	-	1.1	-	-	-

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Group 10 – Intake Air System

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
10–129 Intake Manifold – Remove and Install *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines Remove and install – Sound shield – Air cleaner & housing assembly – Governor spring and arm – Carb/throttle body/gaskets – MAP/MAT/high temp sensors – Intake manifold/gaskets Test run genset	-	-	2.0	-	-	-
10–301 Air Cleaner Element – Replace *Includes:* Remove and install – Sound shield service door – Air cleaner cover hardware – Filter element Test run genset	-	-	0.1	-	-	-

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Group 11 – Exhaust System

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
11–3AA Exhaust Manifold – Replace *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines – Exhaust flex tube – Drain and refill engine fluids Remove and install – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan assembly and belt – Exhaust manifold & gaskets Test run genset	-	-	3.2	-	-	-
11–304 Exhaust Manifold Gaskets – Replace *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines – Exhaust flex tube – Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Flywheel assembly – Fan/assembly and belt – Exhaust manifold & gaskets Test run genset	-	-	3.2	-	-	-

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Group 13 – Electrical Equipment

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
13–104 Starter Motor – Remove and Install *Includes:* Disconnect and connect – Battery leads Remove and install – Sound shield – Starter harness/leads – Starter mounting bolts – Starter Test run genset	-	-	0.3	-	-	-
13–109 Spark Plug – Remove and Install *Includes:* Disconnect and connect – Sound shield door – Spark plug leads – Air filter & housing assembly Remove and replace – Spark plug Test run genset	-	-	0.5	-	-	-
13–116 Ignition Coil and Spark Plug Wires – Remove and Install *Includes:* Disconnect and connect – Battery leads – Fuel line – Wiring harnesses as required Remove and Install: – Drip pan assembly – Sound shield – Cooling air duct assembly – Ignition coil assemblies Test run genset	-	-	1.7	-	-	-

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Group 14 – Engine or Generator Set Testing

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
14–704 Test Run Generator *Includes:* Disconnect and connect – Load bank – Fuel supply – Battery Start and operate set – Check voltage and frequency – Inspect for oil leaks	-	-	0.3	-	-	-

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Group 15 – Electronics

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
15–1AB MAP (Manifold Absolute Pressure) Sensor – Remove and Install *Includes:* Disconnect and connect – Battery leads Remove and install – Genset from coach – Sound shield service door – Generator cover – Sensor lead – Sensor Test run genset	-	-	0.2	-	-	-
15–1AC MAT (Manifold Absolute Temperature) Sensor – Remove and Install *Includes:* Disconnect and connect – Battery leads Remove and install – Air cleaner and housing assembly – Sensor lead – Sensor Test run genset	-	-	2.0	-	-	-
15–1AD Engine Block Temp Sensor – Remove and Install *Includes:* Disconnect and connect – Battery leads Remove and install – Sensor leads – Sensor	-	-	1.0	-	-	-

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Group 16 – Mounting Adaptations

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
16–103 Flywheel – Remove and Install *Includes:* Disconnect and connect – Wiring harnesses as required – Fuel lines – Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Fan assembly & belt – Flywheel assembly Test run genset	-	-	1.5	-	-	-
16–1AA Flywheel Isolator – Remove and Install *Includes:* Disconnect and connect – Wiring harnesses as required – Fuel lines – Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Fan assembly & belt – Flywheel assembly – Belt drive pulley – Isolator & mounting hardware Test run genset	-	-	1.7	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
16–1AB Belt Drive Flywheel Pulley – Remove and Install *Includes:* Disconnect and connect – Wiring harnesses – Fuel lines – Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Fan assembly & belt – Flywheel assembly – Belt drive pulley – Isolator & mounting hardware – Test run genset	-	-	1.6	-	-	-
16–1AC Belt Drive Pulley Bearing – Remove and Install *Includes:* – Disconnect and connect – Wiring harnesses – Fuel lines – Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Magneto assemblies – Fan assembly & belt – Flywheel assembly – Belt drive pulley – Isolator & mounting hardware – Bearing Test run genset	-	-	1.8	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
16–1AE Engine and Generator Mounting Base – Remove and Install *Includes:* Perform 25–1AA Perform 25–1AB Remove and install – Magneto assemblies – Flywheel assembly – Exhaust manifold and gaskets – Engine sheet metal – Engine from base plate – Test run genset	-	-	2.0	-	-	-

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Group 17 – Miscellaneous

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
17–1AK Belt – Remove and Install *Includes:* Disconnect and connect – Wiring harnesses as required – Fuel lines – Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Ignition magnetos – Flywheel assembly – Fan assembly – Belt Test run genset	-	-	1.5	-	-	-
17–1AB Vibration Isolators – Remove and Install *Includes:* Disconnect and connect – Battery cables – Fuel lines – AC output leads Remove and install – Sound shield assembly – Drip tray assembly mounting bolts – Lift set off drip tray – Remove and install – Isolators Test run – Check for leaks	-	-	0.5	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
(continued from previous page)						
17–153 Hydraulic Pump – Remove and Install *Includes:* Remove and install – Hydraulic lines – Enclosure cover and pump seal – Hydraulic pump mounting bolts – Hydraulic pump from engine Bleed air from hydraulic lines Test run genset	-	-	1.0	-	-	-

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Group 25 – Generator

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
25–1AA Main Rotor – Remove and Install *Includes:* Disconnect and connect: – Battery cables – Main leads and associated wiring – Drain and refill engine fluids Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Fan assembly, belt, and pulley – Generator pulley – End bell mounting bolts – End bell cover – Rotor assembly – Test run genset	-	-	2.0	-	-	-
25–1AB Main Stator – Remove and Install *Includes:* Disconnect and connect: – Battery cables – Main leads and associated wiring Remove and install – Engine/generator bracket – Brush block assembly & wiring – End bell mounting bolts – End bell – O-ring – Stator housing assembly Test run genset	-	-	1.0	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
25–1AG Slip Rings – Remove and Install *Includes:* Disconnect and connect: – Battery cables – Main leads and associated wiring Remove and install – Drip pan assembly – Sound shield – Cooling air duct assembly – Fan assembly, belt, and pulley – End bell – Rotor assembly – Stator assembly – Rotor bearings – Slip rings Test run genset	-	-	2.5	-	-	-
25–3AC Generator Bearing – Replace *Includes:* Disconnect and connect: – Battery cables – Main leads and associated wiring Remove and install – Sound shield assembly – Engine/generator bracket – Brush block assembly & wiring – End bell mtg. bolts – End bell – O-ring – Rotor – Bearing – Clean bearing & rotor surfaces Test run genset	-	-	2.5	-	-	-

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Group 26 – Generator Control

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
26–1AB DC Wiring Harness – Remove and Install *Includes:* Disconnect and connect – Sound shield assembly – Battery leads – Starter leads – Fuel pump leads – Leads to PCB assembly – Leads to sensors Test run genset	-	-	0.4	-	-	-
26–1AC AC Control Box Assembly – Remove and Replace *Includes:* Disconnect and connect – Battery cables – Unplug engine harness Remove and install – Sound shield service door – Control box cover & mounting screws – Control assembly Test run genset	-	-	0.2	-	-	-
26–1AD AC Wiring Harness – Remove and Install *Includes:* Disconnect and connect – Battery cables – Sound shield service door – AC control box cover & mtg. screws – AC leads to circuit breaker – AC wiring harness Test run genset	-	-	0.4	-	-	-

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	Special S
26–3AB PCB Control Board – Replace *Includes:* Disconnect and connect – Battery cables – Unplug engine & remote harness Remove and install – Sound shield service door – Control box cover & mounting screws – Control board assembly Test run genset	-	-	0.3	-	-	-
26–3AC Start Solenoid – Replace *Includes:* Disconnect and connect – Battery cables Remove and install – Sound shield assembly – Starter and associated wiring – Starter solenoid Test run genset	-	-	0.3	-	-	-
26–3AE AC Circuit Breaker – Replace *Includes:* Disconnect and connect – Battery cables – Load & line leads to circuit breaker Remove and install – Control box cover & mounting screws – Circuit breaker Test run genset	-	-	0.3	-	-	-

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Request for SRT review

Distributor/Dealer Data		
Distributor/Dealer		Phone No.
Address		
City	State	Zip Code
Country		

My experience has indicated the following repair procedures require more time:

Procedure Data

SRT Number	Procedure Discription	Published time Hrs.	Suggested time Hrs.
		Total Hours	

Generator Set Model
Transfer Switch Model
Repair Date
Technician Name

Describe how repair was performed:

Signature _____ **Title** _____

Mail to: **Onan Corporation**
Service Department
1400 73rd Avenue NE
Minneapolis, MN 55432

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