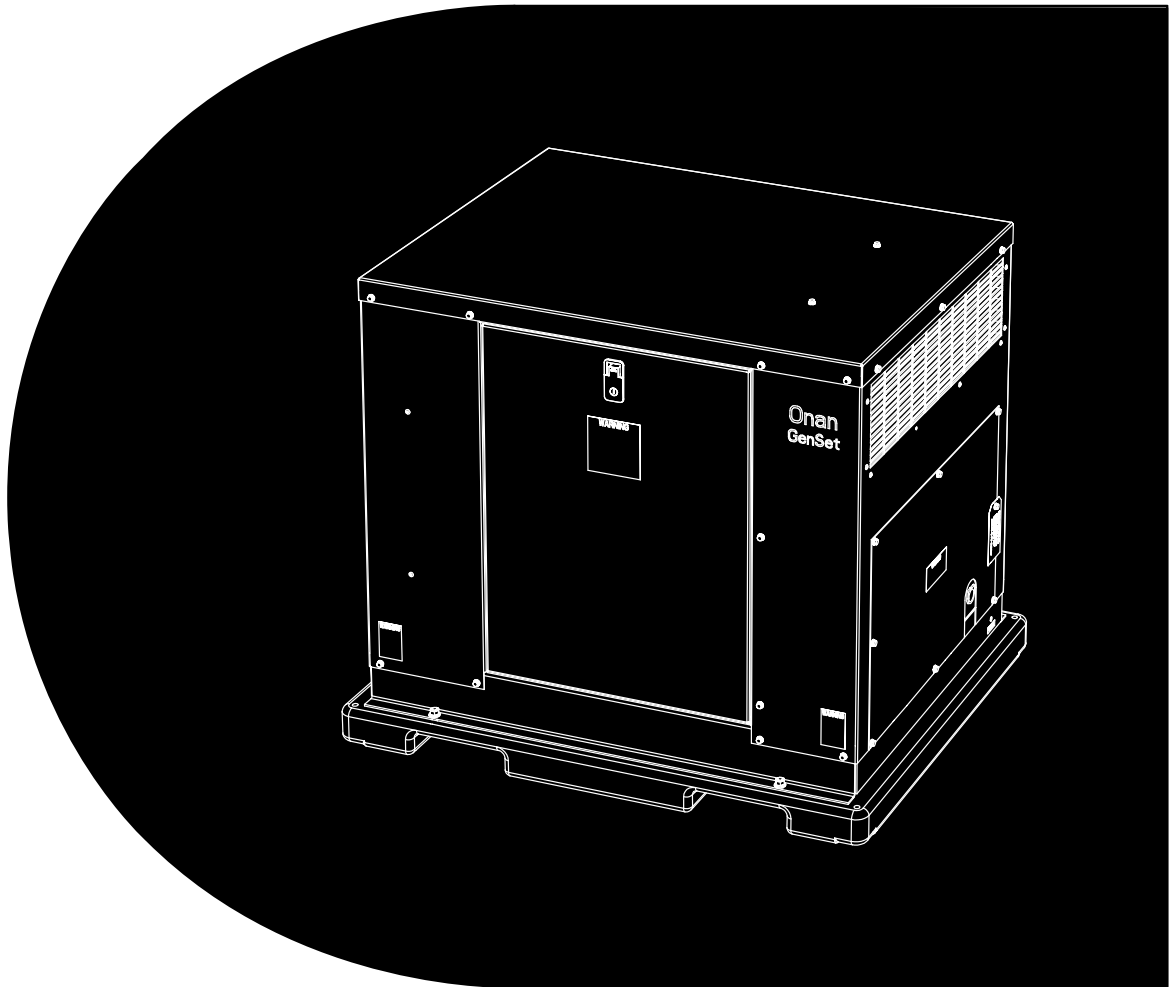


# Standard Repair Times

## GHAB Generator Sets





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## SRT Request Form



## Foreword

The Standard Repair Times (SRTs) 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:

### **Onan Corporation**

1400 73rd Avenue NE  
Minneapolis, MN 55432

Attn: Service Department

## General Information

Standard Repair Times (SRTs) 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 SRTs that a particular mechanic performs more frequently will often require less time than the standard. Conversely, those SRTs 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 SRTs. Most often at least one of each type is necessary to accurately depict the repair. The three types are:

- Administrative
- Troubleshooting
- Repair

## Administrative SRTs

Administrative SRTs 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 SRTs used, etc. It is intended that an administrative SRT be used only once for each repair order. There are two administrative SRTs found in this manual in Group 00 – Complete Engine or Generator Set. One of the administrative SRTs 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 SRTs

Troubleshooting SRTs are intended to be used when diagnosing and analyzing engine, generator set or component failures. Troubleshooting SRTs 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 SRTs contain time to remove and install components to perform the check(s) listed. 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:

<b>Procedure Number</b>	<b>Procedure Description</b>	<b>SRT Hours</b>
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 SRTs

Repair SRTs make up the majority of this manual. These are the SRTs 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 (SRCTs) provide for the combining of the three types of SRTs under one code so that, if appropriate, the user can identify the work performed with fewer SRT codes.



## Manual Organization

### 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”  
XX

“Procedure Number”  
XXX

“Step Number”  
XX

#### Group Numbers

Group numbers (the first two digits in the SRT code) are used to identify major engine components. The following list explains the group numbers used in SRT manuals:

#### 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 within the category.

Group Number	Contents of Group	Specific Repair Number	Description of Category
00	Complete Engine or Generator Set		
01	Cylinder Block	0XX	Troubleshooting ONLY in Group 00
02	Cylinder Head		
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/ Sleeve
09	Drive Units		Modify/Cut/Lap
10	Intake Air System		Adjust/Calibrate
11	Exhaust System	6XX	
12	Air (Compressed) System		
13	Electrical Equipment	7XX	Test
14	Engine or Generator Set Testing		
15	Instruments and Controls		
16	Mounting Adaptations		
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 an SRT.

## General

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.

## How Standard Repair Times are Developed

### 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.

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

An 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 SRTs with sufficient flexibility to account for differences in complaints, failures, progressive damage, customer desires, etc., SRTs 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 interfering application hardware has been removed.

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

As SRTs 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 Times are Developed

SRTs 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 an 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).

## 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.

### 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. An “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.

### “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 (SRCTs)

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

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

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

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

- 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 an 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 SRTs 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 SRTs 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 SRTs accordingly. If the information is not available, make an estimate.
- Total all the times obtained during performance of Steps 2 through 7.

## Standard Repair Times Review Procedure

Onan Corporation makes every effort to be sure the SRTs 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 SRTs 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 SRTs, including supplemental SRTs, are 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.

# Group 00 – Complete Engine or Genset

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<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>00-901 Administrative Time – Open/Close Repair Order</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Clock on and off the job</li> <li>– Move equipment to and from work area</li> <li>– Clean work area and write repair at end of each shift and when job has been completed</li> <li>– Record the following:               <ul style="list-style-type: none"> <li>– Engine model number</li> <li>– Engine serial number</li> <li>– Customer name and address</li> <li>– Original date of purchase</li> <li>– Hours of operation</li> </ul> </li> </ul>	0.4	-	-	-	-	-
<b>00-101 Engine – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Wiring harness</li> <li>– Governor linkage</li> <li>– Fuel lines</li> <li>– Drain and refill engine fluids</li> <li>– Remove and install               <ul style="list-style-type: none"> <li>– Mounting tray and mounts</li> <li>– Housings and baffles</li> <li>– Control and start solenoid assembly</li> <li>– Air cleaner</li> <li>– Air duct assembly and starter</li> <li>– Generator end and generator adapter</li> <li>– Exhaust manifold and gaskets</li> <li>– Intake manifold, gaskets, and carburetor assembly</li> <li>– Engine block</li> </ul> </li> <li>– Test run the genset</li> </ul>	-	-	4.5	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<p><b>(continued from previous page)</b>  <b>00-203 Engine – Rebuild (Gas Engine)</b>  <i>Includes:</i></p> <ul style="list-style-type: none"> <li>- Disconnect and connect</li> <li>- Governor linkage</li> <li>- Electrical wiring</li> <li>- Remove and install</li> <li>- Housing and baffles</li> <li>- Muffler</li> <li>- Generator end</li> <li>- Air cleaner assembly</li> <li>- Carburetor</li> <li>- Air deflector</li> <li>- Starter</li> <li>- Intake manifold</li> <li>- Exhaust manifold</li> <li>- Spark plug</li> <li>- Rocker cover</li> <li>- Cylinder head</li> <li>- Oil base</li> <li>- Balance shaft assembly</li> <li>- Gearcase cover</li> <li>- Connecting rods and pistons</li> <li>- Crankshaft</li> <li>- Camshaft</li> <li>- Tappets</li> <li>- Bearings</li> <li>- Oil seals</li> <li>- Hone or bore cylinder</li> <li>- Test run the genset</li> </ul>	-	-	8.5	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<p><b>(continued from previous page)</b></p> <p><b>00-1AA Generator Set – Remove and Install</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>- Disconnect and connect</li> <li>- Battery cables</li> <li>- Main leads and associated wiring</li> <li>- Fuel lines</li> <li>- Exhaust systems</li> <li>- Remove and install</li> <li>- Generator set from mounting location</li> <li>- Test run the genset fro proper operation</li> </ul>	-	-	2.0	-	-	-
<p><b>00-022 Troubleshoot – Engine Cranks But Will Not Start</b></p> <p><i>Includes:</i></p> <p>-01</p> <ul style="list-style-type: none"> <li>- Check</li> <li>- Battery condition</li> <li>- Fuel supply</li> <li>- Ignition spark</li> <li>- Spark plug</li> </ul> <p>-02</p> <ul style="list-style-type: none"> <li>- Perform checks in step 01</li> <li>- Check</li> <li>- Verify fault code</li> <li>- Fuel supply fittings</li> <li>- Fuel pump</li> <li>- Carburetor choke</li> <li>- Magneto wiring</li> <li>- Control</li> </ul>	-	-	0.3	-	-	-
<p><b>00-0CM Troubleshoot – Engine Oil Leak</b></p> <p><i>Includes:</i></p> <p>-01</p> <ul style="list-style-type: none"> <li>- Clean contaminated area</li> <li>- Run engine and check for leaks</li> </ul> <p>-02</p> <ul style="list-style-type: none"> <li>- Perform checks in step 01</li> <li>- Add dye to oil and check for leaks</li> </ul>	-	-	0.5	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<p><b>(continued from previous page)</b></p> <p><b>00-0AC Troubleshoot – Engine Overfueling (Genset)</b></p> <p><i>Includes:</i></p> <p>-01 – Check</p> <ul style="list-style-type: none"> <li>– Spark plug</li> <li>– Fuel pressure at carburetor</li> <li>– Carburetor piston for free movement</li> <li>– Governor linkage</li> <li>– Carburetor adjustments</li> </ul> <p>-02 – Perform checks in step 01</p> <ul style="list-style-type: none"> <li>– Check</li> <li>– Ignition coil</li> <li>– Magneto</li> <li>– Timing</li> </ul> <p><b>00-0AB Troubleshoot – Engine Starts But Stops When Switch is Released</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>– Check</li> <li>– Fuel pressure</li> <li>– AC output when running</li> <li>– Quadrature voltage</li> <li>– Remote start/stop switch</li> <li>– ATS input control</li> <li>– Evaluate fault codes, if present</li> </ul> <p><b>00-041 Troubleshoot – Engine Unstable (Hunts) (Genset)</b></p> <p><i>Includes:</i></p> <p>-01 – Check</p> <ul style="list-style-type: none"> <li>– Fuel supply</li> <li>– Fuel lines for leakage</li> <li>– Loose wiring connections</li> </ul> <p><i>(continued on next page)</i></p>	-	-	0.6	-	-	-
	-	-	1.0	-	-	-
	-	-	0.5	-	-	-
	-	-	0.3	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<p><b>(continued from previous page)</b></p> <p><b>00-041 Troubleshoot – Engine Unstable (Hunts) (Genset)</b></p> <p>-02 – Perform checks in step 01</p> <p>– Check</p> <p>– Governot linkage for binding</p> <p>– Governor adjustments</p> <p>– Carburetor piston for free movement</p> <p><b>00-0AA Troubleshoot – Engine Will Not Crank</b></p> <p><i>Includes:</i></p> <p>-01 – Check</p> <p>– Battery condition</p> <p>– Battery connections – loose or dirty</p> <p>– Battery cable size</p> <p>– Evaluate fault codes</p> <p>-02 – Perform checks in step 01</p> <p>– Check</p> <p>– Starter</p> <p>– Start/Stop switch</p> <p>– Remote connections</p> <p>– Start solenoid</p> <p>– Control</p> <p>– Connections at control</p> <p><b>00-0AD Troubleshoot – High AC Output (Genset)</b></p> <p><i>Includes:</i></p> <p>-01 – Check</p> <p>– Broken or loose wires</p> <p>– Output lead wiring configuration</p> <p>– Control connections at control</p> <p>– Evaluate fault codes, if present</p> <p><i>(continued on next page)</i></p>	-	-	0.8	-	-	-
	-	-	0.3	-	-	-
	-	-	0.8	-	-	-
	-	-	0.3	-	-	-



Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>Procedure Number and Description</b> <b>(continued from previous page)</b>						
<b>00-0AD Troubleshoot – High AC Output (Genset)</b> -02    – Perform checks in step 01 – Check – Main rotor, slip rings, and brushes – Main stator	-	-	1.0	-	-	-
<b>00-0AG Troubleshoot – No AC Output (Genset)</b> <i>Includes:</i> -01    – Check – Load breakers closed – Broken or loose wires – Output to load breakers – AC output – Evaluate fault codes, if present  -02    – Perform checks in step 01 – Check – Field flash – Control – Output from control to brushes  -03    – Perform checks in step 02 – Check – Rotor winding resistance – Rotor winding grounded – Stator winding resistance	-	-	0.3	-	-	-
<b>00-0BD Troubleshoot – Fault Code 12 (Over Voltage)</b> <i>Includes:</i> – Check – Output voltage – Control	-	-	0.3	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>(continued from previous page)</b> <b>00-0BE Troubleshoot – Fault Code 13 (Under Voltage)</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Check</li> <li>– Loads</li> <li>– Rotor and brushes</li> <li>– Stator</li> <li>– Control</li> </ul>	-	-	0.3	-	-	-
<b>00-0BF Troubleshoot – Fault Code 14 (Over Frequency)</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Check</li> <li>– Engine speed</li> <li>– Loads</li> <li>– Control</li> </ul>	-	-	0.3	-	-	-
<b>00-0BG Troubleshoot – Fault Code 15 (Under Frequency)</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Check</li> <li>– Engine speed</li> <li>– Control</li> </ul>	-	-	0.3	-	-	-
<b>00-0BU Troubleshoot – Fault Code 27 (Loss of AC Sense)</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Check</li> <li>– Wiring from generator to control</li> <li>– Generator stator</li> <li>– Generator rotor</li> <li>– Control</li> <li>– External shorts</li> </ul>	-	-	0.5	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<p><b>(continued from previous page)</b></p> <p><b>00-0BR Troubleshoot – Fault Code 29 (High Battery Voltage)</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>– Check</li> <li>– Battery connections</li> <li>– Battery charge rate</li> <li>– Battery condition</li> </ul>	-	-	0.3	-	-	-
<p><b>00-0BV Troubleshoot – Fault Code 32 (Starter Fault)</b></p> <p><i>Includes:</i></p> <p>-01</p> <ul style="list-style-type: none"> <li>– Check</li> <li>– Battery voltage</li> <li>– Battery condition</li> <li>– Battery connections</li> <li>– Starter</li> <li>– External loads</li> </ul> <p>-02</p> <ul style="list-style-type: none"> <li>– Perform checks in step 01</li> <li>– Check</li> <li>– Field flash</li> <li>– Quad windings</li> <li>– Control</li> </ul>	-	-	0.5	-	-	-
<p><b>00-0CA Troubleshoot – Fault Code 35 (Checksum Fault)</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>– Check</li> <li>– Verify fault</li> <li>– Control</li> </ul>	-	-	0.1	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes					
		R	A	B	C	D	<u>Special</u> S
<b>Procedure Number and Description</b> <b>(continued from previous page)</b>							
<b>00-0BW Troubleshoot – Fault Code 36 (Engine Stopped)</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Check</li> <li>– Fuel pressure</li> <li>– Governor operation</li> <li>– Spark</li> <li>– Loads</li> <li>– Control</li> <li>– Quad voltage</li> <li>– Quad windings</li> <li>– Air temperature switch</li> </ul>	-	-	0.8	-	-	-	
<b>00-0BX Troubleshoot – Fault Code 38 (Field Overload)</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Check</li> <li>– Intake/exhaust restrictions</li> <li>– Control</li> <li>– Rotor and brushes</li> <li>– Power factor of loads</li> </ul>	-	-	0.5	-	-	-	
<b>00-0CB Troubleshoot – Fault Code 42 (Processor Fault – ROM)</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Check</li> <li>– Verify fault</li> <li>– Control</li> </ul>	-	-	0.1	-	-	-	
<b>00-0CC Troubleshoot – Fault Code 43 (Processor Fault – RAM)</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Check</li> <li>– Verify fault</li> <li>– Control</li> </ul>	-	-	0.1	-	-	-	

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<p><b>(continued from previous page)</b></p> <p><b>00-0BY Troubleshoot – Fault Code 45 (Zero Cross Sense Loss)</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>- Check</li> <li>- Field flash</li> <li>- Quad voltage</li> <li>- Quad winding</li> <li>- Quad wiring</li> <li>- Rotor and brushes</li> <li>- Control</li> </ul>	-	-	0.8	-	-	-
<p><b>00-0BZ Troubleshoot – Fault Code 46 (Overcrank)</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>- Check</li> <li>- Fuel pressure</li> <li>- Spark</li> <li>- Battery level</li> <li>- Control</li> </ul>	-	-	0.5	-	-	-
<p><b>00-0CD Troubleshoot – Fault Code 48 (Loss of Field Sense)</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>- Check</li> <li>- Verify fault</li> <li>- Control</li> </ul>	-	-	0.1	-	-	-



# Group 01 – Cylinder Block

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<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>01-311 Block, Short – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>- Disconnect and connect</li> <li>- Governor linkage</li> <li>- Electrical wiring</li> <li>- Drain oil and remove filter</li> <li>- Remove and install</li> <li>- External accessories</li> <li>- Housings</li> <li>- Connecting lines</li> <li>- Exhaust system</li> <li>- Intake manifold</li> <li>- Starter</li> <li>- Flywheel and stator</li> <li>- Cylinder heads</li> <li>- Gearcase cover</li> <li>- Oil base</li> <li>- Oil pump</li> <li>- Oil filter and adapter</li> <li>- Oil pickup tube and cup</li> <li>- Install</li> <li>- Short block assembly</li> <li>- New gaskets</li> <li>- Torque to proper spec</li> <li>- Fill oil pan with oil</li> <li>- Test run unit</li> </ul>	-	-	6.0	-	-	-
<b>01-1AA Connecting Rod – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>- Disconnect and connect</li> <li>- Governor linkage</li> <li>- Electrical wiring</li> </ul> <i>(continued on next page)</i>	-	-	4.0	-	-	-



Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>01-1AA Connecting Rod – Remove and Install</b> – Remove and install – Housing – Flywheel and stator – Intake manifold – Exhaust system – Cylinder head – Oil base – Gearcase cover – Connecting rod and piston – Clean and visually inspect – Crankshaft – Test run unit	-	-	4.0	-	-	-
<b>01-304 Crankshaft Seal, Front – Replace</b> <i>Includes:</i> – Disconnect and connect – Governor linkage – Electrical wiring – Remove and install – Housing – Flywheel and stator – Gearcase cover – Oil seal – Test run engine	-	-	2.0	-	-	-
<b>01-308 Crankshaft Seal, Rear – Replace</b> <i>Includes:</i> – Disconnect and connect – Governor linkage – Electrical wiring – Remove and install – Generator assembly – Bearing plate – Oil seal – Test run engine	-	-	3.0	-	-	-

<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>01-112 Crankshaft – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housing</li> <li>– Flywheel and stator</li> <li>– Starter</li> <li>– Intake manifold</li> <li>– Exhaust manifold</li> <li>– Cylinder heads</li> <li>– Oil base</li> <li>– Gearcase cover</li> <li>– Pistons</li> <li>– Connecting rods</li> <li>– Crankshaft</li> <li>– Crankshaft gear</li> <li>– Bearings</li> <li>– Oil seals</li> <li>– Test run engine</li> </ul>	-	-	7.0	-	-	-
<b>01-541 Cylinder Block – Hone or Bore</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Flywheel and stator</li> <li>– Intake manifold</li> <li>– Exhaust manifold</li> <li>– Cylinder heads</li> <li>– Oil filter and adapter</li> <li>– Oil base</li> </ul> <p><i>(continued on next page)</i></p>	-	-	8.0	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>01-541 Cylinder Block – Hone or Bore</b> – Gearcase cover – Piston and piston rings – Connecting rods – Crankshaft – Camshaft – Valve assembly – Tappets – Bearings – Oil seals – Oil pump – Hone or bore cylinders – Install – New pistons and rings – New connecting rods – New bearings – Adjust valve lash – Test run unit	-	-	8.0	-	-	-
<b>01-107 Gear, Camshaft – Remove and Install</b> <i>Includes:</i> – Disconnect and connect – Governor linkage – Electrical wiring – Remove and install – Housings – Flywheel and stator – Cylinder heads – Oil base – Gearcase cover – Gearcase cover gaskets – Camshaft – Valve assembly – Replace head gaskets – Torque cylinder head – Test run unit	-	-	4.0	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>01-114 Gear, Crankshaft – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Flywheel and stator</li> <li>– Gearcase cover</li> <li>– Crankshaft gear</li> <li>– Test run engine</li> </ul>	-	-	3.0	-	-	-
<b>01-3AB Gear Cover Gasket – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Flywheel and stator</li> <li>– Gearcase cover</li> <li>– Test run unit</li> </ul>	-	-	3.0	-	-	-
<b>01-121 Gear Case Cover – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Flywheel and stator</li> <li>– Gearcase cover</li> <li>– Test run engine</li> </ul>	-	-	2.5	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>01-3AC Piston Rings – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>- Disconnect and connect</li> <li>- Governor linkage</li> <li>- Electrical wiring</li> <li>- Remove and install</li> <li>- Housings</li> <li>- Flywheel and stator</li> <li>- Intake manifold</li> <li>- Exhaust manifold</li> <li>- Cylinder head</li> <li>- Oil base</li> <li>- Gearcase cover</li> <li>- Valve assembly</li> <li>- Connecting rod and piston</li> <li>- Hone and bore cylinder</li> <li>- Adjust valve lash</li> <li>- Test run unit</li> </ul>	-	-	4.3	-	-	-
<b>01-140 Piston Assembly – Remove and Install, All</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>- Disconnect and connect</li> <li>- Governor linkage</li> <li>- Electrical wiring</li> <li>- Remove and install</li> <li>- Housings</li> <li>- Flywheel and stator</li> <li>- Intake manifold</li> <li>- Exhaust manifold</li> <li>- Cylinder heads</li> <li>- Oil base</li> <li>- Gearcase cover</li> <li>- Pistons</li> <li>- Connecting rods</li> <li>- Hone and bore cylinders</li> </ul> <p><i>(continued on next page)</i></p>	-	-	4.3	-	-	-

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>01-140 Piston Assembly – Remove and Install, All</b> – Adjust valve lash – Test run unit	-	-	4.3	-	-	-
<b>01-3AE Camshaft – Remove and Install</b> <i>Includes:</i> – Disconnect and connect – Choke cable – Governor linkage – Electrical wiring – Drain and refill engine fluids – Remove and install – Housing – Flywheel and stator – Starter – Intake manifold – Exhaust manifold – Cylinder heads – Oil base – Gearcase cover – Pistons – Camshaft – Camshaft gears – Bearings – Test run engine	-	-	5.0	-	-	-
<b>01-3AF Connecting Rod Bearings – Replace</b> <i>Includes:</i> – Disconnect and connect – Choke cable – Governor linkage – Electrical wiring – Remove and install – Housings – Flywheel and stator  <i>(continued on next page)</i>	-	-	4.0	-	-	-

<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>01-3AF Connecting Rod Bearings – Replace</b> <ul style="list-style-type: none"> <li>– Intake manifold</li> <li>– Exhaust system</li> <li>– Cylinder heads</li> <li>– Oil base</li> <li>– Gearcase cover</li> <li>– Connecting rod and piston</li> <li>– Connecting rod bearings</li> <li>– Test run engine</li> </ul>	-	-	4.0	-	-	-





# Group 02 – Cylinder Head

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<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>02-104 Cylinder Head – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Housings</li> <li>– Intake manifold</li> <li>– Cylinder heads</li> <li>– Scrape carbon from</li> <li>– Cylinder heads</li> <li>– Top of pistons</li> <li>– Around valves and ports</li> <li>– Replace head gasket</li> <li>– Torque cylinder heads</li> <li>– Test run unit</li> </ul>	–	–	1.7	–	–	–
<b>02-3AA Cylinder Head Gasket – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Housings</li> <li>– Cylinder heads</li> <li>– Scrape carbon from</li> <li>– Cylinder heads</li> <li>– Top of piston</li> <li>– Around valves and ports</li> <li>– Torque to proper spec</li> <li>– Test run unit</li> </ul>	–	–	1.7	–	–	–
<b>02-302 Valve Guides – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Flywheel and stator</li> </ul> <p><i>(continued on next page)</i></p>	–	–	2.3	–	–	–

<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>02-302 Valve Guides – Replace</b> <ul style="list-style-type: none"> <li>– Intake manifold</li> <li>– Cylinder heads</li> <li>– Gearcase cover</li> <li>– Valve assembly</li> <li>– Adjust valve lash</li> <li>– Test run unit</li> </ul>	–	–	2.3	–	–	–



# Group 03 – Rocker Levers

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<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>03-801 Breather Valve – Service</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and Install</li> <li>– Breather cap assembly</li> <li>– Clean and visually inspect</li> <li>– Baffle</li> <li>– Breather valve</li> </ul>	–	–	0.5	–	–	–
<b>03-603 Valves – Adjust, All</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and Install</li> <li>– Intake manifold</li> <li>– Valve covers</li> <li>– Adjust valve lash</li> <li>– Test run unit</li> </ul>	–	–	1.0	–	–	–

# Group 04 – Cam Follower

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<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>04-118 Valve Tappets – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Intake manifold</li> <li>– Cylinder heads</li> <li>– Oil base</li> <li>– Gearcase cover</li> <li>– Valve assembly</li> <li>– Adjust valve lash</li> <li>– Test run unit</li> </ul>	–	–	2.0	–	–	–



# Group 05 – Fuel System

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>05-6AA Carburetor – Adjust</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Air cleaner assembly</li> <li>– Adjust</li> <li>– Idle mixture</li> <li>– Main fuel adjustment</li> <li>– Test run unit</li> </ul>	–	–	0.5	–	–	–
<b>05-118 Carburetor – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Housing</li> <li>– Air cleaner assembly</li> <li>– Carburetor</li> <li>– Adjust</li> <li>– Idle mixture</li> <li>– Main fuel adjustment</li> <li>– Test run unit</li> </ul>	–	–	1.0	–	–	–
<b>05-1AG LPG Converter – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Fuel line</li> <li>– Vacuum line</li> <li>– Remove and install</li> <li>– Converter</li> <li>– Test run unit</li> </ul>	–	–	0.5	–	–	–
<b>05-1AH Fuel Valve Solenoid – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Fuel line</li> </ul>	–	–	1.0	–	–	–

<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>05-1AB Governor Actuator – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Battery cables</li> <li>– Wiring harness</li> <li>– Governor linkage</li> <li>– Remove and install</li> <li>– Governor actuator</li> <li>– Test run unit for proper operation</li> </ul>	–	–	0.5	–	–	–
<b>05-1AK Fuel Pressure Regulator – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Fuel line</li> <li>– Regulator</li> <li>– Check fuel pressure</li> <li>– Test run unit</li> </ul>	–	–	1.0	–	–	–



# Group 07 – Lubricating Oil System

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<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>07-801 Lubricating Oil and Filter – Oil Change</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Drain and fill oil base</li> <li>– Remove and install filter</li> <li>– Fill filter and engine with oil</li> <li>– Check for oil leaks</li> <li>– Test run unit</li> </ul>	–	–	0.5	–	–	–
<b>07-109 Oil Base – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Oil base gasket</li> <li>– Test run unit</li> </ul>	–	–	1.5	–	–	–
<b>07-410 Oil Bypass – Inspect and Reuse</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Air housing</li> <li>– Oil bypass bolt</li> <li>– Washer</li> <li>– Bypass spring</li> <li>– Bypass plunger</li> <li>– Clean and visually inspect</li> <li>– Bore</li> <li>– Plunger</li> <li>– Spring</li> <li>– Test run unit</li> </ul>	–	–	1.0	–	–	–

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<p><b>(continued from previous page)</b></p> <p><b>07-114 Oil Pickup – Remove and Install</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Oil base</li> <li>– Oil pump and pickup</li> <li>– Test run unit</li> </ul>	–	–	1.7	–	–	–
<p><b>07-128 Oil Filter Adapter – Remove and Install</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Housings</li> <li>– LOPKO (low oil pressure cut out)</li> <li>– Gasket</li> <li>– Test run unit</li> </ul>	–	–	1.0	–	–	–
<p><b>07-113 Oil Pump – Remove and Install</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Flywheel</li> <li>– Oil base</li> <li>– Muffler</li> <li>– Gearcase cover</li> <li>– Oil pump</li> <li>– Test run unit</li> </ul>	–	–	3.0	–	–	–

<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<p><b>(continued from previous page)</b></p> <p><b>07-3AA Oil Base Gasket – Replace</b></p> <p><i>Includes:</i></p> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Governor linkage</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Oil base</li> <li>– Check for oil leaks</li> <li>– Test run unit</li> </ul>	–	–	1.5	–	–	–



# Group 10 – Intake Air System

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>10-301 Air Cleaner Element – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Air cleaner cover</li> <li>– Air cleaner element</li> <li>– Test run unit</li> </ul>	–	–	0.2	–	–	–
<b>10-801 Air Cleaner Element – Service</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Outer air cleaner cover</li> <li>– Inner air cleaner cover</li> <li>– Air filter wrapper</li> <li>– Clean and visually inspect</li> <li>– Wrapper</li> <li>– Paper element</li> <li>– Apply fresh oil to wrapper</li> <li>– Test run unit</li> </ul>	–	–	0.2	–	–	–
<b>10-3AA Intake Manifold Gasket – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Air cleaner assembly</li> <li>– Intake manifold</li> <li>– Test run unit</li> </ul>	–	–	1.0	–	–	–

# Group 13 – Electrical Equipment

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<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>13-116 Ignition Coil – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings</li> <li>– Ignition coil</li> <li>– Test run unit</li> </ul>	–	–	0.2	–	–	–
<b>13-117 Ignition Control Module Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Blower wheel</li> <li>– Generator rotor</li> <li>– Generator stator and housing</li> <li>– Ignition module</li> <li>– Test run unit</li> </ul>	–	–	1.5	–	–	–
<b>13-109 Spark Plug – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Spark plug wires</li> <li>– Remove and replace spark plug</li> <li>– Test run genset</li> </ul>	–	–	0.2	–	–	–

<b>Standard Repair Times</b>	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>13-119 Spark Plug Wires – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Spark plug wires</li> <li>– Test run unit</li> </ul>	–	–	0.4	–	–	–
<b>13-104 Starter Motor – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Starter motor</li> <li>– Test run unit</li> </ul>	–	–	0.2	–	–	–
<b>13-1AA Stator, Battery Charging – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Blower wheel</li> <li>– Generator rotor</li> <li>– Generator stator and housing</li> <li>– Test run unit</li> </ul>	–	–	1.5	–	–	–
<b>13-3AA DC Voltage Regulator – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Electrical wiring</li> <li>– Remove and install</li> <li>– Voltage regulator</li> <li>– Test run unit</li> </ul>	–	–	0.2	–	–	–



# Group 15 – Instruments and Controls

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>15-132 Governor Actuator Linkage – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Battery</li> <li>– Wiring harnesses, as needed</li> <li>– Governor actuator</li> <li>– Remove and install</li> <li>– Governor actuator linkage</li> <li>– Test run unit for proper operation</li> </ul>	–	–	0.7	–	–	–
<b>15-133 Governor Control Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Wiring harnesses, as needed</li> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Governor control</li> <li>– Test run unit for proper operation</li> </ul>	–	–	0.7	–	–	–
<b>15-304 Low Oil Pressure Switch – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Wiring harnesses, as needed</li> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Low oil pressure switch</li> <li>– Clean up oil</li> <li>– Test run unit</li> </ul>	–	–	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	<u>Special</u> S
<b>16-103 Flywheel – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Blower housing</li> <li>– Flywheel assembly</li> <li>– Test run unit</li> </ul>	–	–	0.8	–	–	–
<b>16-301 Flywheel Ring Gear – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Blower housing</li> <li>– Flywheel</li> <li>– Ring gear</li> <li>– Test run unit</li> </ul>	–	–	1.3	–	–	–

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>17-131 Muffler – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Housing</li> <li>– Muffler heat shield</li> <li>– Exhaust manifold</li> <li>– Muffler and pipes</li> <li>– Gaskets</li> <li>– Check for exhaust leaks</li> <li>– Test run unit</li> </ul>	–	–	0.9	–	–	–
<b>17-1AD Housing Assembly – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Access doors</li> <li>– Roof panel</li> <li>– Front panel</li> <li>– Rear panel</li> <li>– Engine divider panel</li> <li>– Alternator divider panel</li> </ul>	–	–	1.0	–	–	–

# Group 25 – Generator

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>25-3AB Brushes – Replace</b> <i>Includes:</i> Disconnect and connect – Battery Remove and install – Housings, as required – Alternator divider panel – Brush block assembly – Brushes Test for proper operation	–	–	1.2	–	–	–
<b>25-3AC Generator Bearing – Replace</b> <i>Includes:</i> Disconnect and connect – Battery cables – Wiring harnesses, as needed Remove and install – Housings, as required – Alternator divider panel – Endbell – Bearing Apply adhesive and allow for curing time Test for proper operation	–	–	2.0	–	–	–
<b>25-1AA Main Rotor – Remove and Install</b> <i>Includes:</i> Disconnect and connect – Battery cables – Wiring harnesses, as needed Remove and install – Housings, as required – Alternator divider panel – Endbell – Vibration isolators  <i>(continued on next page)</i>	–	–	2.5	–	–	–

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
Procedure Number and Description	R	A	B	C	D	<u>Special</u> S
<b>25-1AA Main Rotor – Remove and Install</b> – Stator housing – Rotor Test run unit for proper operation	–	–	2.5	–	–	–
<b>25-1AB Main Stator – Remove and Install</b> <i>Includes:</i> Disconnect and connect – Battery cables – Wiring harnesses, as needed Remove and install – Housings, as required – Alternator divider panel – Endbell – Vibration isolators – Stator housing Test run unit for proper operation	–	–	2.5	–	–	–





# Group 26 – Generator Control

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Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>26-3AE AC Circuit Breaker – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Battery</li> <li>– Wiring harnesses, as needed</li> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Circuit breaker</li> <li>– Test run unit for proper operation</li> </ul>	–	–	0.5	–	–	–
<b>26-3AP AC Voltage Transformer – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Battery</li> <li>– Wiring harnesses, as needed</li> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– AC voltage transformer</li> <li>– Test run unit for proper operation</li> </ul>	–	–	0.3	–	–	–
<b>26-3AB PCB Control Board – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Battery</li> <li>– Wiring harnesses, as needed</li> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– PCB control board</li> <li>– Test with proper test tools</li> <li>– Test run unit for proper operation</li> </ul>	–	–	0.3	–	–	–

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>26-1AD AC Wiring Harness – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Disconnect and connect</li> <li>– Battery</li> <li>– AC leads to circuit breaker</li> <li>– AC leads to PCB control</li> <li>– Test run genset</li> </ul>	–	–	0.5	–	–	–
<b>26-3AJ Start/Stop Switch – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Battery</li> <li>– Wiring harnesses, as needed</li> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Start/Stop switch</li> <li>– Test run unit for proper operation</li> </ul>	–	–	0.3	–	–	–
<b>26-3AN Fuse – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Battery</li> <li>– Wiring harnesses, as needed</li> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Fuse</li> <li>– Test run unit for proper operation</li> </ul>	–	–	0.1	–	–	–

Standard Repair Times	Removed From Chassis	In-Chassis Service Accessibility Codes				
		R	A	B	C	D
<b>26-3AK Hourmeter – Replace</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Disconnect and connect</li> <li>– Battery</li> <li>– Wiring harnesses, as needed</li> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Hourmeter</li> <li>– Test run unit for proper operation</li> </ul>	–	–	0.3	–	–	–
<b>26-1AB Control DC Wiring Harness – Remove and Install</b> <i>Includes:</i> <ul style="list-style-type: none"> <li>– Remove and install</li> <li>– Housings, as required</li> <li>– Disconnect and connect</li> <li>– Battery</li> <li>– DC leads to circuit breaker</li> <li>– DC leads to PCB control</li> <li>– Test run genset</li> </ul>	–	–	1.2	–	–	–

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# Request for SRT Review

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

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

<b>Procedure Data</b>			
<b>SRT Number</b>	<b>Procedure Discription</b>	<b>Published time Hrs.</b>	<b>Suggested time Hrs.</b>
<b>Total Hours</b>			

<b>Generator Set Model</b>
<b>Transfer Switch Model</b>
<b>Repair Date</b>
<b>Technician Name</b>

Describe how repair was performed:

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Signature \_\_\_\_\_ Title \_\_\_\_\_

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







**Cummins Power Generation**  
1400 73rd Avenue N.E.  
Minneapolis, MN 55432  
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