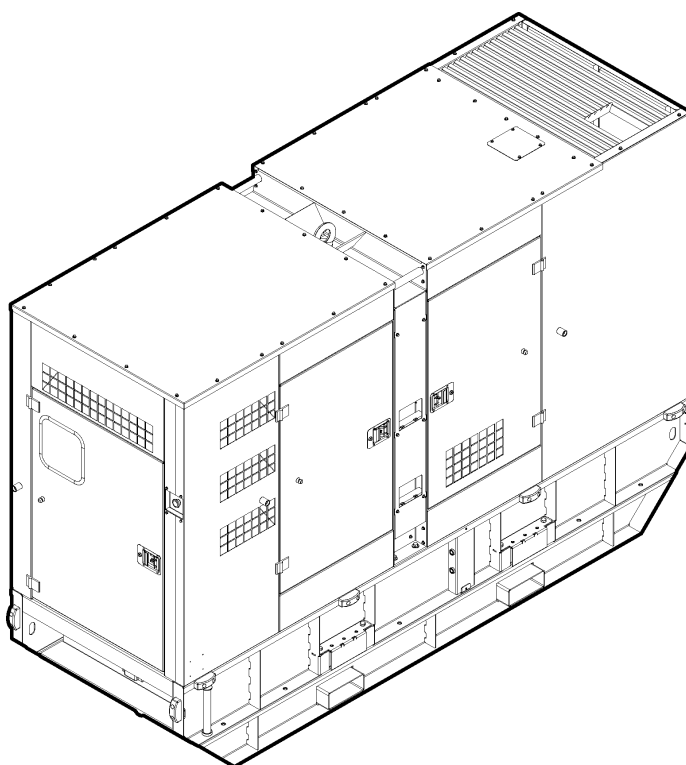




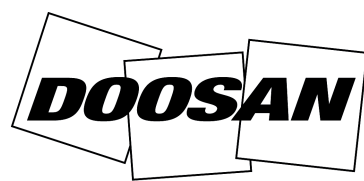
Portable Power

G60, G80, G100, G150, G200-SIIIA OPERATION & MAINTENANCE MANUAL Original Instruction



This manual contains important safety information and must be made available to personnel who operate and maintain this machine.

G60-SIIIA	SERIAL No : G06030001 ->
G80-SIIIA	SERIAL No : G08030001 ->
G100-SIIIA	SERIAL No : G10030001 ->
G150-SIIIA	SERIAL No : G15030001 ->
G200-SIIIA	SERIAL No : G20030001 ->



Portable Power

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REFERENCE INFORMATION

Write the correct information for YOUR DIPP generator in the spaces below. Always use these numbers when referring to your DIPP generator.

Generator Serial Number _____
Engine Serial Number _____

NOTES:

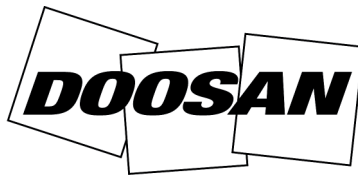
YOUR DIPP DEALER:

ADDRESS:

PHONE:



Doosan Benelux SA
Drève Richelle 167
B-1410 Waterloo
BELGIUM



Portable Power

FOREWORD

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FOREWORD

The contents of this manual are considered to be proprietary and confidential to and should not be reproduced without the prior written permission of the company.

Nothing contained in this document is intended to extend any promise, warranty or representation, expressed or implied, regarding the products described herein. Any such warranties or other terms and conditions of sale of products shall be in accordance with the standard terms and conditions of sale for such products, which are available upon request.

This manual contains instructions and technical data to cover all routine operation and scheduled maintenance tasks by operation & maintenance staff. Major overhauls are outside the scope of this manual and should be referred to an authorised service department.

The design specification of this machine has been certified as complying with EC directives. As a result:

a) Any machine modifications are strictly prohibited, and will invalidate EC certification.

The use of repair parts / lubricants / fluids other than those included within the approved parts list may create hazardous conditions over which the company has no control. Therefore the company cannot be held responsible for equipment in which non-approved repair parts are installed.

The company reserves the right to make changes and improvements to products without notice and without incurring any obligation to make such changes or add such improvements to products sold previously.

The intended uses of this machine are outlined below and examples of unapproved usage are also given, however the company cannot anticipate every application or work situation that may arise.

IF IN DOUBT CONSULT SUPERVISION.

This machine has been designed and supplied for use only in the following specified conditions and applications:

- Operation within the ambient temperature range specified in the *GENERAL INFORMATION* section of this manual.

The use of the machine in any of the situation types listed in table 1:

a) Is not approved,

b) May impair the safety of users and other persons, and

c) May prejudice any claims made against the company.

TABLE 1

Use of the machine outside the ambient temperature range specified in the *GENERAL INFORMATION SECTION* of this manual.

This machine is not intended and must not be used in potentially explosive atmospheres, including situations where flammable gases or vapours may be present.

Use of the machine fitted with non approved components / lubricants / fluids.

Use of the machine with safety or control components missing or disabled.

Use of the machine for storage or transportation of materials inside or on the enclosure except when contained within the toolbox.

GENERATOR

Use of the generator to supply load(s) greater than those specified.

Use of unsafe or unserviceable electrical equipment connected to the generator.

Use of electrical equipment: (a) Having incorrect voltage and / or frequency ratings. (b) Containing computer equipment and / or similar electronics.

The company accepts no responsibility for errors in translation of this manual from the original English version.

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DOOSAN COMPANY

DECLARATION OF CONFORMITY



¹⁾ EC Declaration of Conformity

²⁾ Original declaration

³⁾ We:

Doosan International USA, Inc
1293 Glenway Drive
Statesville
North Carolina 28625-9218
USA

⁴⁾ Represented in EC by:

Doosan Trading Limited
Block B, Swords Business Campus
Swords
Co. Dublin
Ireland

⁵⁾ Hereby declare that, under our sole responsibility the product(s)

⁶⁾ Machine description: Portable Generator

⁷⁾ Machine Model: G10, G20, G30, G40, G40-SIIIA, G60-SIIIA, G80-SIIIA, G100-SIIIA, G150-SIIIA, G200-SIIIA, G250, G400, G500

⁸⁾ Commercial name: G10, G20, G30, G40, G40-SIIIA, G60-SIIIA, G80-SIIIA, G100-SIIIA, G150-SIIIA, G200-SIIIA, G250, G400, G500

⁹⁾ Serial number:

¹⁰⁾ is (are) in conformity with the relevant provision of the following EC Directive(s)

- ¹¹⁾ 2006/42/EC The Machine Directive
¹²⁾ 2004/108/EC The Electromagnetic Compatibility Directive
¹³⁾ 2000/14/EC The Noise Emission Directive
¹⁶⁾ 97/68/EC The emission of engines for no-road mobile machinery
³¹⁾ 2006/95/EC The Low Voltage Equipment Directive
¹⁷⁾ and their amendments

¹⁸⁾ Conformity with the Noise Emission Directive 2000/14/EC

¹⁹⁾ Directive 2000/14/EC, Annex VI, Part I

²⁰⁾ Notified body: AV Technology, Stockport, UK. Nr 1067

²¹⁾ Machine		²³⁾ Measured sound power level	²⁴⁾ Guaranteed sound power level	²¹⁾ Machine		²³⁾ Measured sound power level	²⁴⁾ Guaranteed sound power level
²²⁾ Type	kW			²²⁾ Type	kW		
G10	8	90,6 _{LWA}	91 _{LWA}	G100-SIIIA	80	94,3 _{LWA}	95 _{LWA}
G20	16	93,6 _{LWA}	94 _{LWA}	G150-SIIIA	120	95,6 _{LWA}	96 _{LWA}
G30	25	93,5 _{LWA}	94 _{LWA}	G200-SIIIA	160	95,8 _{LWA}	97 _{LWA}
G40	32	95,1 _{LWA}	96 _{LWA}	G250	205	96,5 _{LWA}	97 _{LWA}
G40-SIIIA	32	88,8 _{LWA}	92 _{LWA}	G400	328	97,7 _{LWA}	98 _{LWA}
G60-SIIIA	48	91,5 _{LWA}	92 _{LWA}	G500	400	98,2 _{LWA}	99 _{LWA}
G80-SIIIA	64	93,3 _{LWA}	94 _{LWA}				

Jan Moravec

²⁷⁾ Engineering Manager

²⁸⁾ Issued at Dobris, Czech Republic

²⁹⁾ Date

³⁰⁾ The technical documentation for the machinery is available from:

Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgium

CPN 46552201 rev G

bg - Превод на Декларацията за съответствие на ЕК

1) Декларацията за съответствие на ЕК, 2) Оригинална декларация, 3) **Ние**., 4) **Представявяни в ЕК от:**, 5) **по този начин заявяваме**, на своя собствена отговорност, **че продуктът(ите)**, 6C) Описание на машината: Преносим винтов компресор, 6LT) Описание на машината: Леко преносимо скеле, 6G) Описание на машината: Преносим генератор, 7) Модел на машината:, 8) Търговско наименование:, 9) Идентификационен номер на МПС (VIN) / Серийн номер:, 9) Серийн номер:, 10) **е (са) в съответствие със съответните клаузи на следната Директива(и) на ЕК**, 11) 2006/42/ЕС Директива в областта на машиностроенето, 12) 2004/108/ЕС Директива за електромагнитната съвместимост, 13) 2000/14/ЕС Директива за намаляване на нивото на шума, 14) 97/23/ЕС Директива за уредите под налягане, 15) 2009/105/ЕС Директива за обикновените съдове под налягане, 16) 97/68/ЕС Емисиите от двигатели на извънпътни подвижни машини, 17) и техните подобрения, 18) **Съответствие с Директивата за намаляването на нивото на шума 2000/14/ЕС**, 19) Директива 2000/14/ЕС, Annex VI, Част I, 20) Уведомена организация: AV Technology, Стокпорт, Великобритания. № 1067, 21) Машина, 22) Тип, 23) Измерено ниво на силата на звука, 24) Гарантирано ниво на силата на звука, 25) **Съответствие с Директивата за уреди под налягане 97/23/ЕС**, 26) Ние декларираме, че този продукт е оценен съгласно Директивата за уредите под налягане 97/23/ЕС и съгласно условията на тази Директива е изключен от обхвата на тази Директива. Той може да носи маркировка "CE" съгласно други приложими директиви на ЕК, 27) Мениджър инженеринг, 28) Издадена в Добрис, Република Чехия, 29) Дата, 30) **Техническата документация за машините е налична в:**, Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Ватерло, Белгия, 31) 2006/95/ЕС Директива за оборудване за ниско напрежение

da - Oversættelse af EU Overensstemmelseserklæringen

1) **EU Overensstemmelseserklæring**, 2) Oprindelig erklæring, 3) **Vi**., 4) **Repræsenteret i EU af:**, 5) **erklærer hermed og under vores eneansvar at produktet/-erne**, 6C) Beskrivelse af maskinen: Bærbar skruekompressor, 6LT) Beskrivelse af maskinen: Bærbart lystårn, 6G) Beskrivelse af maskinen: Bærbar generator, 7) Maskinmodel:, 8) Handelsnavn:, 9) VIN-/Serienummer:, 9) Serienummer:, 10) **er i overensstemmelse med de relevante bestemmelser i følgende EU direktiv/-er**, 11) 2006/42/EF Maskineridirektivet, 12) 2004/108/EF Direktivet om elektromagnetisk kompatibilitet, 13) 2000/14/EF Støjemissionsdirektivet, 14) 97/23/EF Direktivet om trykbærende udstyr, 15) 2009/105/EF Direktivet om simple trykbeholdere, 16) 97/68/EF Emission fra forbrændingsmotorer i mobile ikke-vejgående maskiner, 17) og deres ændringer, 18) **Overensstemmelse med støjemissionsdirektivet 2000/14/EF**, 19) Direktiv 2000/14/EF, Bilag VI, Del I, 20) Underrettet organ: AV Technology, Stockport, UK. Nr 1067, 21) Maskine, 22) Type, 23) Målt lydeffektniveau, 24) Garanteret lydeffektniveau, 25) **Overensstemmelse med direktivet om trykbærende udstyr 97/23/EF**, 26) Vi erklærer at dette produkt er blevet vurderet i henhold til direktivet om trykbærende udstyr 97/23/EF og i henhold til vilkårene i dette direktiv, er blevet undtaget fra rammerne i dette direktiv. Det kan bære "CE" mærket i overensstemmelse med andre gældende EU-direktiver., 27) Teknisk chef, 28) Udstedt i Dobris, Tjekkiet, 29) Dato, 30) **Den tekniske dokumentation for maskineriet kan fås hos:**, Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgien, 31) 2006/95/EF Lavspændingsdirektiv

de – Übersetzung der EG-Konformitätserklärung

1) **EG-Konformitätserklärung**, 2) Originalfassung, 3) **Der Hersteller:**, 4) **vertreten in der EG durch:**, 5) **erklärt hiermit, dass das nachfolgende Produkt/die nachfolgenden Produkte**, 6C) Maschinenbezeichnung: mobile Schraubenkompressoranlage, 6LT) Maschinenbezeichnung: mobiler Scheinwerfermast, 6G) Maschinenbezeichnung: mobiler Generator, 7) Typenbezeichnung:, 8) Handelsname:, 9) VIN / Seriennummer:, 9) Seriennummer:, 10) **mit den einschlägigen Bestimmungen der nachfolgenden EG-Richtlinie(n) übereinstimmt/übereinstimmen:**, 11) der Maschinenrichtlinie 2006/42/EG, 12) der Richtlinie 2004/108/EG über die elektromagnetische Verträglichkeit, 13) der Lärmschutzrichtlinie 2000/14/EG, 14) der Druckgeräte richtlinie 97/23/EG, 15) der Richtlinie 2009/105/EG über einfache Druckbehälter, 16) der Richtlinie 97/68/EG über Maßnahmen zur Bekämpfung der Emission von gasförmigen Schadstoffen und luftverunreinigenden Partikeln aus Verbrennungsmotoren für mobile Maschinen und Geräte, 17) und deren Änderungen, 18) **Konformität mit der Lärmschutzrichtlinie 2000/14/EG**, 19) Richtlinie 2000/14/EG, Anhang VI, Teil I, 20) Benannte Stelle: AV Technology, Stockport, UK. Nr. 1067, 21) Maschine, 22) Typ, 23) Gemessene Schalleistung, 24) Garantierte Schalleistung, 25) **Konformität mit der Druckgeräte richtlinie 97/23/EG**, 26) Der Hersteller erklärt hiermit, dass dieses Produkt nach der Druckgeräte richtlinie 97/23/EG bewertet und im Sinne dieser Richtlinie vom Anwendungsbereich dieser Richtlinie ausgenommen wurde. Dieses Produkt darf in Übereinstimmung mit anderen anwendbaren EG-Richtlinien das CE-Kennzeichen tragen., 27) Technischer Leiter, 28) Ausgestellt in Dobris, Tschechische Republik, 29) Datum, 30) **Die technische Dokumentation zur Maschine ist erhältlich bei:**, Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgien, 31) 2006/95/EG der Richtlinie für Ausrüstung mit Niederspannung

el – Μετάφραση της Δήλωσης Συμμόρφωσης της ΕΚ

1) **Δήλωση Συμμόρφωσης της Ε.Κ.**, 2) Πρωτότυπη δήλωση, 3) **Εμείς, η εταιρεία:**, 4) **Εκπροσωπούμενη στην Ε.Κ. από την:**, 5) **Δια της παρούσας δηλώνουμε ότι, με την αποκλειστική μας ευθύνη, τα προϊόντα**, 6C) Περιγραφή μηχανήματος: Φορητός κοχλιοφόρος συμπιεστής, 6LT) Περιγραφή μηχανήματος: Φορητός πύργος φωτισμού, 6G) Περιγραφή μηχανήματος: Φορητή Γεννήτρια, 7) Μοντέλο μηχανήματος:, 8) Εμπορική ονομασία:, 9) Αναγνωριστικός αριθμός / αριθμός παραγωγής:, 9) Αριθμός παραγωγής:, 10) **πληροί(πληρούν) τις σχετικές διατάξεις των παρακάτω Οδηγιών της ΕΚ**, 11) 2006/42/ΕΚ Οδηγία περί Μηχανημάτων, 12) 2004/108/ΕΚ Οδηγία περί Ηλεκτρομαγνητικής Συμβατότητας, 13) 2000/14/ΕΚ Οδηγία περί Εκπομπών Θορύβου, 14) 97/23/ΕΚ Οδηγία περί Εξοπλισμού υπό Πίεση, 15) 2009/105/ΕΚ Οδηγία περί Απλών Λογείων Πίεσης, 16) 97/68/ΕΚ Την οδηγία περί εκπομπών κινητήρων από μη οδικώς μεταφερόμενα μηχανήματα, 17) και τις τροποποιήσεις τους, 18) **Συμβατότητα με την Οδηγία περί Εκπομπών Θορύβου 2000/14/ΕΚ**, 19) Οδηγία 2000/14/ΕΚ, Παράρτημα VI, Μέρος I, 20) Φορέας πιστοποίησης: AV Technology, Stockport, UK. Αρ. 1067, 21) Μηχάνημα, 22) Τύπος, 23) Μετρούμενη στάθμη ισχύος θορύβου, 24) Εγγυημένη στάθμη ισχύος θορύβου, 25) **Συμβατότητα με την Οδηγία περί Μηχανημάτων υπό Πίεση 97/23/ΕΚ**, 26) Δηλώνουμε ότι το προϊόν αυτό έχει αξιολογηθεί σύμφωνα με την Οδηγία περί Εξοπλισμού υπό Πίεση 97/23/ΕΚ και, σύμφωνα με τους όρους αυτής της Οδηγίας, έχει εξαιρεθεί από το πεδίο εφαρμογής αυτής της Οδηγίας. Ενδέχεται να φέρει τη σήμανση "CE", σύμφωνα με άλλες συμβατές οδηγίες της ΕΚ., 27) Διευθυντής Μηχανολογικού Σχεδιασμού, 28) Εκδίδεται στο Dobris, Δημοκρατία της Τσεχίας, 29) Ημερομηνία, 30) **Η τεχνική τεκμηρίωση για τα μηχανήματα διατίθεται από τη διεύθυνση:** Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgium, 31) 2006/95/ΕΚ Οδηγία περί εξοπλισμού χαμηλής τάσης

es – Traducción de la Declaración de conformidad de la CE

1) **Declaración de conformidad de la CE**, 2) Declaración original, 3) **Nosotros:**, 4) **Representados en la CE por:**, 5) **Declaramos por el presente que, bajo nuestra exclusiva responsabilidad el/los producto/s**, 6C) Descripción del equipo: Compresor de husillo portátil, 6LT) Descripción del equipo: Torre de luz portátil, 6G) Descripción del equipo: Generador portátil, 7) Modelo del equipo:, 8) Nombre comercial:, 9) Número de serie / VIN:, 9) Número de serie:, 10) **Cumple/n con las disposiciones pertinentes de la/s siguientes Directiva/s de la CE**, 11) Directiva de máquinas 2006/42/CE, 12) Directiva de compatibilidad electromagnética 2004/108/CE, 13) Directiva de emisión de ruidos 2000/14/CE, 14) Directiva de equipos de presión 97/23/CE, 15) Directiva de recipientes de presión simple 2009/105/CE, 16) Emisión de motores para máquina móvil no de carretera 97/68/CE, 17) y sus enmiendas, 18) **Conformidad con la Directiva de emisión de ruidos 2000/14/CE**, 19) Directiva 2000/14/CE, Anexo VI, Parte I, 20) Organismo notificado: AV Technology, Stockport, RU. Nr 1067, 21) Máquina, 22) Tipo, 23) Nivel de potencia acústica medido, 24) Nivel de potencia acústica garantizado, 25) **Conformidad con la Directiva de equipos de presión 97/23/CE**, 26) Declaramos que este producto ha sido evaluado de acuerdo con la Directiva de equipos de presión 97/23/CE y, en conformidad con los términos de esta Directiva, ha sido excluido del ámbito de aplicación de ésta. Puede llevar marcado "CE" en cumplimiento de otras directivas de la CE pertinentes., 27) Gerente de ingeniería, 28) Emitido en Dobris, República Checa, 29) Fecha, 30) **La documentación técnica de la máquina está disponible en:** Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Bélgica, 31) 2006/95/CE Directiva del equipo de baja tensión

fi - Käänös EU:n vaatimustenmukaisuusvakuutuksesta

1) **EU:n vaatimustenmukaisuusvakuutus**, 2) Alkuperäinen vakuutus, 3) **Me**, 4) **Edustaja EU:ssa**, 5) **vakuutamme yksinvastuullisena, että tuote/tuotteet**, 6C) Koneen kuvaus: Kannettava ruuvikompressor, 6LT) Koneen kuvaus: Kannettava valopylväs, 6G) Koneen kuvaus: Kannettava generaattori, 7) Konemalli:, 8) Kaupallinen nimi:, 9) VIN-/sarjanumero:, 9) Sarjanumero:, 10) **vastaa(vat) seuraavien EU-direktiivien oleellisia vaatimuksia**, 11) 2006/42/EY Konedirektiivi, 12) 2004/108/EY Sähkömagneettinen yhteensopivuus -direktiivi, 13) 2000/14/EY Melupäästödirektiivi, 14) 97/23/EY Painelaitedirektiivi, 15) 2009/105/EY Yksinkertainen paineastia –direktiivi, 16) 97/68/EY Liikuvien työkonien moottoreiden päästöt, 17) ja näihin tehtyjä muutoksia, 18) **Yhdenmukaisuus meludirektiivin 2000/14/EY kanssa**, 19) Direktiivi 2000/14/EY, liite VI, osa I, 20) Ilmoitettu tarkastuslaitos: AV Technology, Stockport, Iso-Britannia. Nr 1067, 21) Kone, 22) Tyypit, 23) Mitattu äänitehotaso, 24) Taattu äänitehotaso, 25) **Yhdenmukaisuus painelaitedirektiivin 97/23/EY kanssa**, 26) Vakuutamme, että tämä tuote on tarkastettu painelaitedirektiivin 97/23/EY mukaisesti, ja tämän direktiivin ehtojen mukaisesti suljettu pois tämän direktiivin piiristä. Siinä voidaan käyttää CE-merkintää muiden soveltuvien EY-direktiivien mukaisesti, 27) Tekninen päällikkö, 28) Julkaistu Dobrisissa Tsekin tasavallassa, 29) Päivämäärä, 30) **Koneen tekniset asiakirjat ovat saatavissa seuraavalta:** Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgia, 31) 2006/95/EY Matalajännitedirektiivi

fr - traduction de la déclaration de conformité de la CE

1) **Déclaration de conformité de la CEE**, 2) Déclaration originale, 3) **Nous soussignés :**, 4) **Représentés dans la CE par :**, 5) **déclarons par la présente, solidairement responsables que le ou les produits**, 6C) Description de la machine : Compresseur à vis portable, 6LT) Description de la machine : Colonne lumineuse, 6G) Description de la machine : Groupe électrogène portable, 7) Type de la machine :, 8) Désignation commerciale :, 9) VIN / Numéro de série :, 9) Numéro de série :, 10) **Sont parfaitement conformes aux exigences afférentes de la ou des directives CE suivantes**, 11) 2006/42/EC Directive de la mécanique, 12) 2004/108/EC Directive de la compatibilité électro magnétique, 13) 2000/14/EC Directive des émissions de bruit, 14) 97/23/EC Directive des équipements sous pression, 15) 2009/105/EC Récipients chaudronnés simples sous pression, 16) 97/68/EC Émission des moteurs pour équipements mécaniques mobiles hors route, 17) et leurs amendements, 18) **Conformité à la directive des émissions de bruit 2000/14/EC**, 19) Directive 2000/14/EC, Annexe VI, Partie I, 20) Organisme notifié : AV Technology, Stockport, UK. Num 1067, 21) Machine, 22) Type, 23) Puissance acoustique mesurée, 24) Puissance acoustique garantie, 25) **Conformité à la directive des équipements sous pression 97/23/EC**, 26) Nous déclarons que ce produit a été évalué selon la directive des équipements sous pression 97/23/EC et conformément aux termes de cette dernière, il est exclu de l'objet de cette directive. Le produit peut porter le marquage CE en conformité avec d'autres directives CE applicables., 27) Directeur de l'ingénierie, 28) Fait à Dobris, République Tchèque, 29) Date, 30) **La documentation technique de l'équipement mécanique est disponible à l'adresse suivante :** Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgium, 31) 2006/95/EC Directive basse tension

hu - EK-megfelelőségi nyilatkozat fordítása

1) **EK-megfelelőségi nyilatkozat**, 2) Eredeti nyilatkozat, 3) **Mi**, 4) **Akiket az EK-ban a következő vállalat képvisel:**, 5) **Kizárólagos felelősségünk tudatában kijelentjük, hogy az alábbi termék(ek)**, 6C) Gép leírása: Hordozható csavarkompresszor, 6LT) Gép leírása: Hordozható világítótorony, 6G) Gép leírása: Hordozható generátor, 7) Gépmodell:, 8) Kereskedelmi név:, 9) Azonosító / Sorozatszám:, 9) Sorozatszám, 10) **megfelel(nek) a következő EK irányelv(ek) vonatkozó pontjainak**., 11) 2006/42/EK Gépekre vonatkozó irányelv, 12) 2004/108/EK Elektromágneses Kompatibilitási Irányelv, 13) 2000/14/EK Zajemissziós Irányelv, 14) 97/23/EK Nyomás alatt működő berendezésekre vonatkozó irányelv, 15) 2009/105/EK Egyszerű nyomástartályokra vonatkozó irányelv, 16) 97/68/EK Nem közúti használatú motorok emissziója, 17) és ennek kiegészítései, 18) **Megfelel a 2000/14/EK Zajemissziós Irányelvnek**, 19) 2000/14/EK Irányelv, VI. Függelék, I. Rész, 20) Értéslendő testület: AV Technology, Stockport, Egyesült-Királyság. 1067 sz., 21) Gép, 22) Típus, 23) Mért hangteljesítmény-szint, 24) Garantált hangteljesítmény-szint, 25) **Megfelel a 97/23/EK Nyomás alatt működő berendezésekre vonatkozó irányelvnek**, 26) Kijelentjük, hogy a termék az 97/23/EK Nyomás alatt működő berendezésekre vonatkozó irányelv alapján bevizsgálásra került, az Irányelv feltételeinek megfelelően kizárásra került az Irányelv hatóköréből. Egyéb vonatkozó EK irányelvekkel kapcsolatosan viselheti a „CE” jelölést., 27) Gépszeti vezető, 28) Kibocsátás helye: Dobris, Cseh Köztársaság, 29) Dátum, 30) **A gép szerkezetére vonatkozó műszaki dokumentáció az alábbi helyen érhető el:** Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgium, 31) 2006/95/EK Kisfeszültségű elektromos berendezésekre vonatkozó irányelv

it – Traduzione della Dichiarazione di Conformità CE

1) **Dichiarazione di Conformità CE**, 2) Dichiarazione originale, 3) **Noi**., 4) **Rappresentati nella CE da:**, 5) **Con la presente dichiariamo che, sotto la nostra esclusiva responsabilità, il/i prodotto(i)**, 6C) Descrizione della macchina: Comprensore a vite portatile, 6LT) Descrizione della macchina: Torre luminosa portatile, 6G) Descrizione della macchina: Generatore portatile, 7) Modello della macchina:, 8) Denominazione commerciale:, 9) VIN / N. di serie:, 9) N. di serie:, 10) **è/sono conforme/i alle disposizioni della/e seguente/i direttiva/e CE**, 11) 2006/42/CE Direttiva Macchine, 12) 2004/108/CE Direttiva sulla Compatibilità Elettromagnetica, 13) 2000/14/CE Direttiva sulle Emissioni Acustiche, 14) 97/23/CE Direttiva sulle Apparecchiature a Pressione, 15) 2009/105/CE Direttiva sui Recipienti a Pressione Semplice, 16) 97/68/CE Emissione motori per macchine mobili non stradali, 17) e relative modifiche, 18) **Conformità con la Direttiva sulle Emissioni Acustiche 2000/14/CE**, 19) Direttiva 2000/14/CE, Allegato VI, Parte I, 20) Ente notificatore: AV Technology, Stockport, Regno Unito. N. 1067, 21) Macchina, 22) Tipo, 23) Livello di potenza sonora misurato, 24) Livello di potenza sonora garantito, 25) **Conformità con la Direttiva sulle Apparecchiature a Pressione 97/23/CE**, 26) Dichiariamo che questo prodotto è stato verificato secondo la Direttiva sulle Apparecchiature a Pressione 97/23/CE e, in conformità con le disposizioni di questa Direttiva, è stato escluso dallo scopo di questa Direttiva. Può essere dotato della marcatura "CE" in conformità con altre direttive CE applicabili., 27) Responsabile Tecnico, 28) Emesso a Dobris, Repubblica Ceca, 29) Data, 30) **La documentazione tecnica della macchina è disponibile presso:** Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgio, 31) 2006/95/CE Direttiva sulle apparecchiature a bassa tensione

nl – Vertaling van de EG-verklaring van overeenstemming

1) **EG-verklaring van overeenstemming**, 2) Originele verklaring, 3) **Wij**, 4) **Vertegenwoordigd in de EG door**, 5) **Verklaren hierbij dat het product/de producten**, 6C) Machinebeschrijving: schroefcompressor, 6LT) Machinebeschrijving: Draagbare lichttoeren, 6G) Machinebeschrijving: Draagbare generator, 7) Model:, 8) Naam:, 9) VIN / Serienummer:, 9) Serienummer:, 10) **In overeenstemming is (zijn) met de volgende EG-richtlijn(en)**, 11) 2006/42/EG De Machineryrichtlijn, 12) 2004/108/EG De Richtlijn Elektromagnetische compatibiliteit, 13) 2000/14/EG De Richtlijn Geluid mobiele werktuigen, 14) 97/23/EG De Richtlijn Drukapparatuur, 15) 2009/105/EG De Richtlijn Drukkraten van enkelvoudige vorm, 16) 97/68/EG De Richtlijn Uitstoot van motoren voor niet voor de weg bestemde machines, 17) zoals geamendeerd, 18) **Overeenstemming met Richtlijn 2000/14/EG Geluid mobiele werktuigen**, 19) Richtlijn 2000/14/EG, Bijlage VI, Deel I, 20) Ingelichte instantie: AV Technology, Stockport, UK, Nr 1067, 21) Machine, 22) Type, 23) Gemeten geluidsniveau, 24) Gegarandeerd geluidsvermogeniveau, 25) **Overeenstemming met Richtlijn 97/23/EG: Drukapparatuur**, 26) Wij verklaren dat dit product is beoordeeld op basis van Richtlijn 97/23/EG: Drukapparatuur. Volgens de bepalingen van deze Richtlijn valt de machine niet onder de Richtlijn. De machine mag het "CE"-keurmerk dragen, om aan te geven dat de machine voldoet aan andere geldende EG-richtlijnen, 27) Engineering Manager, 28) Uitgegeven te Dobris, Tsjechische Republiek, 29) Datum, 30) **De technische documentatie voor de machine is verkrijgbaar bij**: Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, België, 31) 2006/95/EG De laagspanningsrichtlijn

no – Oversettelse av EU-samsvarserklæring

1) **EU-samsvarserklæring**, 2) 3) **Vi**, 4) **Representert i EU av**, 5) **herved med enansvar at produktet/produktene**, 6C) Maskinbeskrivelse: Bærbær skruekompressor, 6LT) Maskinbeskrivelse: Bærbart lystårn, 6G) Maskinbeskrivelse: Bærbær generator, 7) Maskinmodell:, 8) Handelsnavn:, 9) VIN / Serienummer:, 9) Serienummer:, 10) **samsvarer med de relevante bestemmelsene i følgende EU-direktiv(er)**, 11) 2006/42/EF Maskindirektivet, 12) 2004/108/EF Direktivet om elektromagnetisk kompatibilitet, 13) 2000/14/EF Direktivet om støyemisjon, 14) 97/23/EF Direktivet om trykksatt utstyr, 15) 2009/105/EF Direktivet om enkle trykkbeholdere, 16) 97/66/EF Utslipp fra motorer til mobilt maskineri som ikke kjøres på vei, 17) med endringer, 18) **Samsvar med direktivet om støyemisjon, 2000/14/EF**, 19) Direktiv 2000/14/EF, tillegg VI, del I, 20) Meldt organ: AV Technology, Stockport, Storbritannia Nr. 1067, 21) Maskin, 22) Type, 23) Målt lydeffektiv, 24) Garantert lydeffektiv, 25) **Samsvar med direktivet om trykksatt utstyr, 97/23/EF**, 26) Vi erklærer at dette produktet er vurdert i henhold til direktivet om trykksatt utstyr, 97/23/EF, og i samsvar med vilkårene i dette direktivet er det unntatt fra omfanget av dette direktivet. Det kan være "CE"-merket i samsvar med andre relevante EU-direktiver, 27) sjef, 28) Utstedt i Dobris, Den tsjekkiske republikk, 29) Dato, 30) **Den tekniske dokumentasjonen for maskineriet er tilgjengelig fra**: Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgia, 31) 2006/95/EF Lavspenningsdirektiv

pl – Tłumaczenie deklaracji zgodności WE

1) **Deklaracja zgodności WE**, 2) Originalna deklaracja, 3) **My**, 4) **Reprezentowani we WE przez**, 5) **oświadczamy niniejszym na swoją wyłączną odpowiedzialność, że**, 6C) Opis urządzenia: Przenośna sprężarka śrubowa, 6LT) Opis urządzenia: Przenośny maszt oświetleniowy, 6G) Opis urządzenia: Przenośny generator prądu, 7) Model urządzenia:, 8) Nazwa komercyjna:, 9) Nr ident. pojazdu (VIN) / numer seryjny:, 9) Numer seryjny:, 10) **spełniające właściwe wymagania zawarte w następujących dyrektywach WE**, 11) Dyrektywa maszynowa 2006/42/WE, 12) Dyrektywa kompatybilności elektromagnetycznej 2004/108/WE, 13) Dyrektywa o dopuszczalnej emisji hałasu 2000/14/WE, 14) Dyrektywa ciśnieniowa 97/23/WE, 15) Dyrektywa o prostych zbiornikach ciśnieniowych 2009/105/WE, 16) Rozporządzenia o ruchomych urządzeniach innych niż pojazdy drogowe 97/68/WE, 17) i ich zmienionych wersjach, 18) **Zgodność z dyrektywą o dopuszczalnej emisji hałasu 2000/14/WE**, 19) Dyrektywa 2000/14/WE, załącznik VI, część I, 20) Jednostka notyfikowana: AV Technology, Stockport, Zjednoczone Królestwo. Nr 1067, 21) Urządzenie, 22) Typ, 23) Zmierzony poziom hałasu, 24) Gwarantowany poziom hałasu, 25) **Zgodność z dyrektywą ciśnieniową 97/23/WE**, 26) Oświadczamy, że ten produkt został zbadany zgodnie z wymogami dyrektywy 97/23/WE oraz na podstawie tej dyrektywy został wyłączony spod jej obowiązywania. W myśl innych właściwych dyrektyw WE może być oznaczony znakiem „CE”., 27) Kierownik działu inżynieryjnego, 28) Wystawiono w Dobris (Czechy), 29) Data, 30) **Dokumentację techniczną urządzenia można otrzymać od**: Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgia, 31) 2006/95/WE Dyrektywa dotycząca urządzeń niskonapięciowych

pt – Tradução da Declaração de Conformidade CE

1) **Declaração de Conformidade CE**, 2) Declaração Original, 3) **Nós**, 4) **Representados na CE por**, 5) **Declaramos pela presente que, sob nossa completa responsabilidade, o(s) produto(s)**, Descrição da máquina: Compressor de Parafusos Portátil, 6LT) Descrição da máquina: Torre de Luz Portátil, 6G) Descrição da máquina: Gerador Portátil, 7) Modelo da Máquina:, 8) Nome Comercial:, 9) VIN / Número de Série, 9) Número de Série:, 10) **está(ão) em conformidade com as providões relevantes da(s) seguinte(s) diretiva(s) da CE**, 11) Directiva de Maquinaria 2006/42/CE, 12) Directiva de Compatibilidade Electromagnética 2004/108/CE, 13) de Emissões de Ruídos 2000/14/CE, 14) de Equipamento de Pressão 97/23/CE, 15) Directiva de Recipientes de Pressão Simples 2009/105/CE, 16) Emissão de motores para máquinas móveis não-rodoviária 97/68/CE, 17) e respectivas emendas, 18) **Conformidade com a Directiva de Emissões de Ruídos 2000/14/CE**, 19) Directiva 2000/14/CE, Anexo VI, Parte I, 20) Entidade notificada: AV Technology, Stockport, Reino Unido. N.º 1067, 21) Máquina, 22) Tipo, 23) Medição de nível de potência sonora, 24) Nível garantido de potência sonora, 25) **Conformidade com a Directiva de Equipamento de Pressão 97/23/CE**, 26) Nós declaramos que este produto foi avaliado de acordo com a Directiva de Equipamento de Pressão 97/23/CE e, de acordo com os termos desta Directiva, foi excluído do âmbito desta directiva. É permitido apresentar a marcação "CE" em conformidade com as restantes directivas aplicáveis da CE, 27) Director de Engenharia, 28) Emitido em Dobris, República Checa, 29) Data, 30) **A documentação técnica da maquinaria está disponível através da**: Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Bélgica, 31) 2006/95/CE Directiva de Equipamentos de Baixa Tensão

ro – Traducere a Declarației de conformitate CE

1) **Declarație de conformitate CE**, 2) Declarația originală, 3) **Noi**, 4) **Reprezențați în CE de către**, 5) **Prin prezenta declarăm pe proprie răspundere că produsul(ele)**, 6C) Descrierea echipamentului: Compresor mobil cu șurub, 6LT) Descrierea echipamentului: Turn de iluminat mobil, 6G) Descrierea echipamentului: Generator mobil, 7) Modelul echipamentului:, 8) Denumirea comercială:, 9) Număr de identificare / Număr de fabricație:, 9) **este (sunt) în conformitate cu dispozitiile relevante din următoarele Directive CE**, 11) Directiva privind mașinile industriale 2006/42/CE, 12) Directiva privind compatibilitatea electromagnetica 2004/108/CE, 13) Directiva privind emisiile de zgomot 2000/14/CE, 14) Directiva privind echipamentele sub presiune 97/23/CE, 15) Directiva privind recipientele simple sub presiune 2009/105/CE, 16) Emisii de gaze ale motoarelor de utilaje mobile nerutiere 97/68/CE, 17) și amendamentele acestora, 18) **Conformitatea cu Directiva 2000/14/CE privind emisiile de zgomot**, 19) Directiva 2000/14/CE, Anexa VI, Partea I, 20) Organismul notificat: AV Technology, Stockport, UK. Nr 1067, 21) Echipament, 22) Tip, 23) Nivel măsurat putere acustică, 24) Nivel garantat putere acustică, 25) **Conformitate cu Directiva 97/23/CE privind Echipamente sub presiune**, 26) Declărăm că acest produs a fost evaluat în conformitate cu Directiva 97/23/CE privind Echipamente sub presiune și, în conformitate cu termenii acestei Directive, a fost exclus din domeniul de aplicare a prezentei Directive. Acesta poate purta marcajul "CE" în conformitate cu alte directive CE aplicabile., 27) Director tehnic, 28) Eliberat în Dobris, Republica Cehă, 29) Data, 30) **Documentația tehnică pentru echipament este disponibilă la adresa**: Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgium, 31) 2006/95/CE Directiva pentru Echipamente de Joasă Tensiune

ru – Перевод декларации о соответствии нормам ЕС

1) **Декларация о соответствии нормам ЕС**, 2) Оригинал декларации, 3) **Мы**, 4) **Имеющие представительство в ЕС в лице**, 5) **Настоящим заявляем, что под нашей личной ответственностью следующий продукт(ы)**, 6C) Описание машины: Передвижной винтовой компрессор, 6LT) Описание машины: Передвижная стойка освещения, 6G) Описание машины: Передвижной генератор, 7) Модель машины:, 8) Торговое название:, 9) № поставщика / заводской номер:, 9) Заводской номер:, 10) **соответствует нормам следующих директив(ы) ЕС**, 11) Директива ЕС по машинам, механизмам и машинному оборудованию, 2006/42/ЕС, 12) Директива ЕС по электромагнитной совместимости, 2004/108/ЕС, 13) Директива ЕС по шумам в окружающей среде, 2000/14/ЕС, 14) Директива ЕС по оборудованию, работающему под давлением, 97/23/ЕС, 15) Директива ЕС по простым сосудам под давлением, 2009/105/ЕС, 16) Директива 97/68/ЕС относительно мер против выбросов газов и твердых частиц двигателями внутреннего сгорания, установленными на внедорожных транспортных средствах, 17) включая приложения и изменения, 18) **Соответствие нормам директивы ЕС по шумам в окружающей среде, 2000/14/ЕС**, 19) Директива 2000/14/ЕС, Приложение VI, Часть I, 20) Оповещенный орган: AV Technology, Stockport, UK. Nr 1067, 21) Машина, 22) Тип, 23) Замеры уровня мощности звука, 24) Гарантированный уровень мощности звука, 25) **Соответствие нормам директивы ЕС по оборудованию, работающему под давлением, 97/23/ЕС**, 26) Мы заявляем, что этот продукт прошел аттестацию на соответствие нормам директивы по оборудованию, работающему под давлением, 97/23/ЕС, и на основании требований этой директивы был исключен из содержания и области ее применения. На основании других применимых директив ЕС продукту присвоено право маркировки "CE"., 27) Главный инженер, 28) Издано в г. Добрис, Чешская Республика, 29) Дата, 30) **Запрос на техническую документацию по оборудованию направлять по адресу**: Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgium, 31) 2006/95/ЕС Директива по низковольтному оборудованию

sk – Preklad Prehlásenia ES o zhode

1) **Prehlásenie ES o zhode**, 2) Originálne prehlásenie, 3) **Naša spoločnosť**, 4) **zastupovaná v ES**, 5) **Týmto prehlasujeme na našu vlastnú zodpovednosť, že výrobok/ky**, 6C) Popis zariadenia: Prenosný skrutkový kompresor, 6LT) Popis zariadenia: Prenosná svetelná veža, 6G) Popis zariadenia: Prenosný generátor, 7) Typ zariadenia:, 8) Obchodný názov:, 9) VIN – identifikačné číslo vozidla / Sériové číslo:, 9) Sériové číslo:, 10) **je (sú) v súlade s príslušnými predpismi nasledujúceho/cich nariadení ES**, 11) 2006/42/ES Nariadenie o strojnóm vybavení, 12) 2004/108/ES Nariadenie o elektromagnetickej kompatibilite, 13) 2000/14/ES Nariadenie o elektromagnetickej kompatibilite, 14) 97/23/ES Nariadenie o tlakovom zariadení, 15) 2009/105/ES Nariadenie o jednoduchých tlakových nádobách, 16) 97/68/ES Emisie motorov pre stroje mobilne zariadenia mimo cestnú premávku, 17) a ich zmeny, 18) **Zhoda s nariadením č. 2000/14/ES o emisii hluku**, 19) Nariadenie 2000/14/ES, Príloha VI, časť I, 20) Oboznámený úrad: AV Technology, Stockport, VB. Č. 1067, 21) Zariadenie, 22) Typ, 23) Zvážená hladina akustického výkonu, 24) Zarúčená hladina akustického výkonu, 25) **Zhoda s nariadením č. 97/23/ES týkajúcim sa tlakových zariadení**, 26) Týmto prehlasujeme, že tento výrobok bol vymeraný v súlade s nariadením 97/23/ES o tlakovom zariadení a v zhode s podmienkami tohto nariadenia bol vyňatý z rozsahu tohto nariadenia. Výrobok môže byť označený štítkom „CE” v súlade s ďalšími platnými nariadeniami ES., 27) Technický riaditeľ, 28) Vydané v Dobříši, Česká republika, 29) Dátum, 30) **Technickú dokumentáciu pre stroje zariadenie je možno obdržať na adrese**: Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgicko, 31) 2006/95/ES Smernica pre nízkonapäťové vybavenie

sv – Översättning av EC-försäkran om överensstämmelse

1) **EC-försäkran om överensstämmelse**, 2) Ursprunglig försäkran, 3) **Vi**, 4) **Representeras i EC av**, 5) **Försäkrar härmed att under vårt totala ansvar produkten/produkterna**, 6C) Maskinbeskrivning: Portabel skruvkompressor, 6LT) Maskinbeskrivning: Portabel ljusfyr, 6G) Maskinbeskrivning: Portabel generator, 7) Maskinmodell:, 8) Kommersiellt namn:, 9) VIN-serieummer:, 9) Serienummer:, 10) **översämsstämmer med relevanta bestämmelser i följande EC-direktiv**, 11) Maskindirektiv 2006/42/EC, 12) Direktiv 2004/108/EC om elektromagnetisk kompatibilitet, 13) irektiv 2000/14/EC om bullerutsläpp, 14) Direktiv 97/23/EC om tryckutrustning, 15) Direktiv 2009/105/EC om enkla tryckkärl, 16) Direktiv 97/68/EC om motorutsläpp från mobila terrängfordon, 17) samt tillhörande tillägg, 18) **Överensstämmelse med direktiv 2000/14/EC om bullerutsläpp**, 19) Direktiv 2000/14/EC, bilaga VI, del I, 20) Anmält organ: AV Technology, Stockport, Storbritannien. Nr 1067, 21) Maskin, 22) Typ, 23) Uppmätt ljudeffektiv, 24) Garanterad ljudeffektiv, 25) **Överensstämmelse med direktiv 97/23/EC om tryckutrustning**, 26) Vi försäkrar att denna produkt har bedömts enligt direktiv 97/23/EC om tryckutrustning och att den i enlighet med villkoren i detta direktiv har undantagits från omfattningen av detta direktiv. Den kan vara försedd med "CE"-märkning för överensstämmelse med andra tillämpbara EG-direktiv., 27) Verkstadschef, 28) Utfärdat i Dobris, Tjeckien, 29) Datum, 30) **Maskinens tekniska dokumentation kan beställas från**: Doosan Infracore Portable Power EMEA, Dreve Richelle 167, B-1410 Waterloo, Belgien, 31) 2006/95/EC Direktivet för lågspänningsutrustning



Portable Power

GENERAL DATA

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GENERAL DATA

UNIT MODEL	G60	G80	G100	G150	G200
Engine Speed - RPM	1500 / 1800	1500 / 1800	1500 / 1800	1500 / 1800	1500 / 1800
Engine Fuel	Diesel	Diesel	Diesel	Diesel	Diesel
Manufacturer	John Deere	John Deere	John Deere	John Deere	John Deere
Model	4045HFG81	4045HFG82	4045HFG82	6068HFG82	6068HFG82
Number of cylinders / Displacement (litres)	4 / 4,5	4 / 4,5	4 / 4,5	6 / 6,8	6 / 6,8
FLUID CAPACITIES					
Engine Crankcase Lubricant (litres)	12	14,7	14,7	32,5	32,5
Fuel Tank (litres)	177 (358 optional)	280 (560 optional)	280 (560 optional)	500 (1000 optional)	500 (1000 optional)
Radiator & Engine Coolant (litres)	24	20	20	32	32
Electrical System	12VDC	12VDC	12VDC	12VDC	12VDC
UNIT MEASUREMENTS / WEIGHTS					
Overall length (mm)	2550	2774	2774	3614	3614
Overall width (mm)	965	1230	1230	1290	1290
Overall height (mm) (12 hours fuel tank)	1554	1665,5	1665,5	2103	2103
Overall height (mm) (24 hours fuel tank)	1714	1833,5	1833,5	2353	2353
Weight (with fuel) (kg)	1734	2070	2130	3019	3149
Weight (without fuel) (kg)	1587	1796	1858	2575	2705
COG (°)	2.9/0.8	0.1	0.1	1.1	1.8

GENERAL INFO

G60 INFORMATION ON AIRBORNE NOISE

- The A-weighted emission sound pressure level
64 dB(A), uncertainty 1 dB(A)
- The A-weighted emission sound power level
92 dB(A), uncertainty 1 dB(A)

G80 INFORMATION ON AIRBORNE NOISE

- The A-weighted emission sound pressure level
76 dB(A), uncertainty 1 dB(A)
- The A-weighted emission sound power level
94 dB(A), uncertainty 1 dB(A)

G100 INFORMATION ON AIRBORNE NOISE

- The A-weighted emission sound pressure level
77 dB(A), uncertainty 1 dB(A)
- The A-weighted emission sound power level
95 dB(A), uncertainty 1 dB(A)

G150 INFORMATION ON AIRBORNE NOISE

- The A-weighted emission sound pressure level
77 dB(A), uncertainty 1 dB(A)
- The A-weighted emission sound power level
96 dB(A), uncertainty 1 dB(A)

G200 INFORMATION ON AIRBORNE NOISE

- The A-weighted emission sound pressure level
78 dB(A), uncertainty 1 dB(A)
- The A-weighted emission sound power level
97 dB(A), uncertainty 1 dB(A)

The operating conditions of the machinery are in compliance with ISO 3744:1995 and EN ISO 8528-10:1998.

ELECTRICAL DATA

UNIT MODEL	G60	G80	G100	G150	G200
Nominal Apparent Power (kVA Prime)	60	80	100	150	200
Nominal Active Power (kW Prime)	48	64	80	120	160
Nominal Voltage	400	400	400	400	400
Nominal Current (PF=1)	69	93	116	173	231
Nominal Current (PF=0,8)	86	115	145	216	289

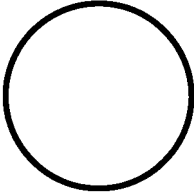
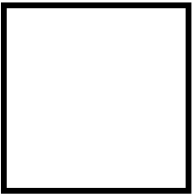
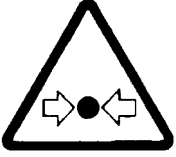
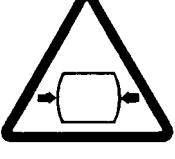
SAFETY

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SAFETY DECALS

GRAPHIC FORM AND MEANING OF ISO SYMBOLS

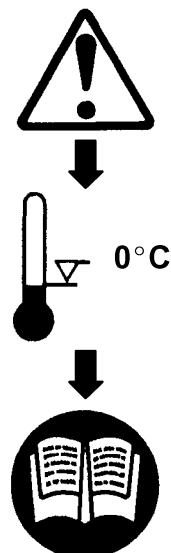
		
PROHIBITION / MANDATORY	INFORMATION / INSTRUCTIONS	WARNING
 WARNING: Electrical shock risk	 WARNING - Pressurised component or system.	 WARNING - Hot surface.
 WARNING - Pressure control.	 WARNING - Corrosion risk.	 WARNING - Air/gas flow or Air discharge.
 WARNING - Pressurised vessel.	 WARNING - Hot and harmful exhaust gas.	 WARNING - Flammable liquid.
 Do not stand on any service valve or other parts of the pressure system.	  Do not operate with the doors or enclosure open.	 Do not use fork lift truck from this side.
 Do not remove the Operating and Maintenance manual and manual holder from this machine.	 Do not stack.	 Do not operate the machine without the guard being fitted.



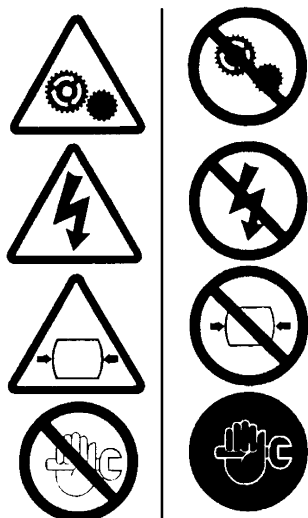
WARNING - Maintain correct tyre pressure.



WARNING - Before connecting the tow bar or commencing to tow consult the Operation & Maintenance manual.



WARNING - For operating temperature below 0°C (32°F), consult the Operation & Maintenance manual.



WARNING - Do not undertake any maintenance on this machine until the electrical supply is disconnected and the air pressure is totally relieved.



WARNING - Consult the Operation & Maintenance manual before commencing any maintenance.



Do not breathe the compressed air from this machine.



Do not exceed the trailer speed limit.



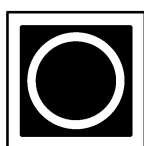
No naked lights.



Do not open the service valve before the airhose is attached.



Use fork lift truck from this side only.



Emergency stop.



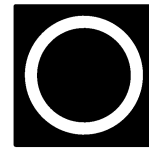
Tie down point



Lifting point.



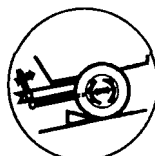
On (power).



Off (power).



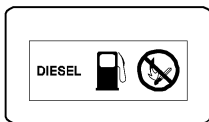
Read the Operation & Maintenance manual before operation or maintenance of this machine is undertaken.



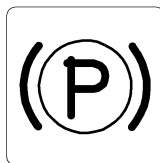
When parking use prop stand, handbrake and wheel chocks.



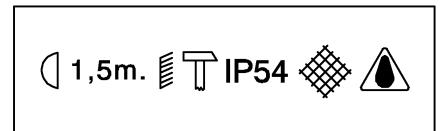
Compressor oil filling



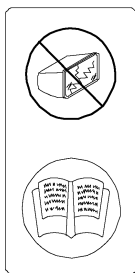
Diesel fuel
No open flame.



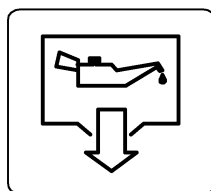
Parking brake.



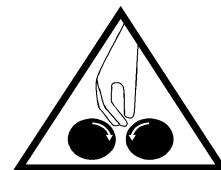
Rough Service Designation.
Wet Location Operation.



Replace any cracked protective shield.



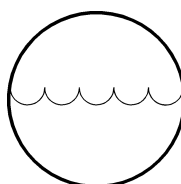
Oil drain.



Crush Warning



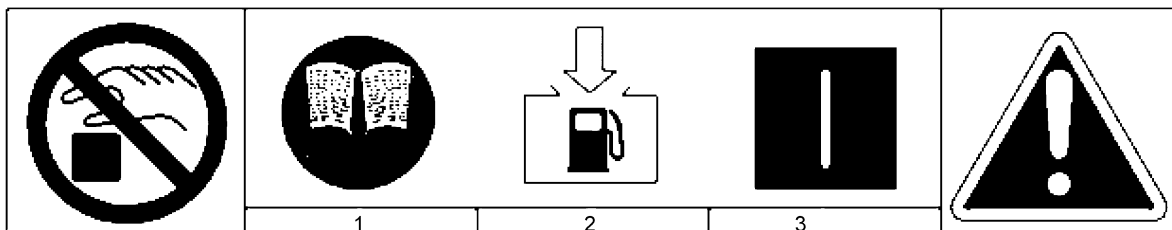
No Water



Coolant Fill



No Flame



Fill with fuel before start-up

SAFETY INSTRUCTIONS



DANGER

This machine is not designed for operating life-sustaining equipment. It is equipped with a safety shutdown system that will cause the machine to stop operating whenever a shutdown condition is present.

Never operate the machine inside a building without adequate ventilation. Avoid breathing exhaust fumes when working on or near the machine.



WARNING

A battery contains sulfuric acid and can give off gases which are corrosive and potentially explosive. Avoid contact with skin, eyes, and clothing. In case of contact, flush area immediately with water.



WARNING

Improper operation of this equipment can cause severe injury or death. Read the Operation & Maintenance manual supplied with this machine before operation or service.

Modification or alteration of this machine CAN result in severe injury or death. Do not alter or modify this machine without the express written consent of the manufacturer.



WARNING

This machine is equipped with an Auto Start System, which can cause the machine to start at any time. Follow all safety recommendations outlined in this manual to avoid injury to personnel. **DISCONNECT BATTERY BEFORE SERVICING.**



CAUTION

Exercise extreme caution when using booster battery. To jump battery, connect ends of one booster cable to the positive (+) terminal of each battery. Connect one end of other cable to the negative (-) terminal of the booster battery and other end to a earth connection away from dead battery (to avoid a spark occurring near any explosive gases that may be present). After starting unit, always disconnect cables in reverse order.



WARNING

Never inspect or service unit without first disconnecting battery cable(s) to prevent accidental starting.

Wear eye protection while cleaning unit with compressed air, to prevent debris from injuring eyes.



WARNING

HOT PRESSURISED FLUID - Remove cap slowly to relieve **PRESSURE** from **HOT** radiator. Protect skin and eyes. **HOT** water or steam and chemical additives can cause serious personal injury.



WARNING

Flammable Fuels - Do not fill tank when engine is running.

Do not smoke or use an open flame in the vicinity of the generator set or fuel tank. Do not permit smoking, open flame, or sparks to occur near the battery, fuel, cleaning solvents or other flammable substances and explosive gases.

Do not operate Genset if fuel has been spilled inside or near the unit.

WARNING

Electrical Shock -

Do not operate electrical equipment while standing in water, on wet earth or with wet hands or shoes.

Use extreme caution when working on electrical components. Battery voltage (12V / 24V DC) is present unless the battery cables have been disconnected. Higher voltage (potentially 480V) is possibly present at all times.

WARNING

Always treat electrical circuits as if they were energised.

Disable Start Control before attempting any repair service, disconnect all leads to electrical power requirements and disconnect battery to prevent start up.

EARTHING

Comply with applicable electrical codes.

WARNING

The Generator Set can produce high voltages, which can cause severe injury or death to personnel and damage to equipment. The Generator Set should have proper internal and external earth when required by IEC 364-4-41.

The Generator Set is internally earthed neutral to the frame of the Generator Set. This internal earth connection is essential for proper Generator Set performance and personal protection.

External earthing consists of connecting the generator neutral to a solid earth, and is the responsibility of the operator, when earthing is required by IEC 364-4-41 Protection Against Electric Shock, and other local codes as applicable.

Several methods are employed to externally earth portable generator sets, depending on the intended use and code requirements. In all cases, a continuous length of splice-free copper cable, no smaller than 10 mm², shall be used for the external earth conductor, when earthing is required.

A qualified, licensed electrical contractor, knowledgeable in local codes, should be consulted.

WARNING

Failure to properly earth the Generator Set can result in severe injury or death.

IF USED AS ALTERNATE POWER SUPPLY

Connect only after the main service entrance switch has been DISCONNECTED and LOCKED OPEN. In addition, circuit overload protection must be provided in accordance with National Electrical Codes and local regulations.

CAUTION

Welding -

Prior to any welding, disconnect alternator relays, diagnostic circuit board, voltage regulator circuit board, meters, circuit breakers and battery cables. Open all circuit breakers, and remove any external connections (except earthing rod). Connect the welding earth as close as possible to the area being welded.

WARNING

Electrical Loading -

Never make electrical connections with the unit running.

Before placing the unit in operation, verify the electrical rating of the Generator Set and do not exceed generator set ratings.

HAZARDOUS SUBSTANCE PRECAUTION



Use extreme care to avoid contacting hot surfaces (engine exhaust manifold and piping).

Ensure that adequate ventilation of the cooling system and exhaust gases is maintained at all times.

The following substances are used in the manufacture of this machine and may be hazardous to health if used incorrectly.

Avoid ingestion, skin contact and breathing fumes for the following substances: Antifreeze, Engine Lubricating Oil, Preservative Grease, Rust Preventative, Diesel Fuel and Battery Electrolyte.

The following substances may be produced during the operation of this machine and may be hazardous to health:

- Avoid build-up of engine exhaust fumes in confined spaces.
- Avoid breathing exhaust fumes.
- Avoid breathing brake lining dust during maintenance.
- **Always operate in a well ventilated area.**

WARNINGS

Warnings call attention to instructions which must be followed precisely to avoid injury or death.

CAUTIONS

Cautions call attention to instructions which must be followed precisely to avoid damaging the product, process or its surroundings.

NOTES

Notes are used for supplementary information.

GENERAL INFORMATION

Ensure that the operator reads and understands the decals and consults the manuals before maintenance or operation.

Ensure that the Operation & Maintenance manual, and the manual holder, are not removed permanently from the machine.

Ensure that maintenance personnel are adequately trained, competent and have read the Maintenance Manuals.

Make sure that all protective covers are in place and that the canopy / doors are closed during operation.

The specification of this machine is such that the machine is not suitable for use in flammable gas risk areas. If such an application is required then all local regulations, codes of practice and site rules must be observed. To ensure that the machine can operate in a safe and reliable manner, additional equipment such as gas detection, exhaust spark arresters, and intake (shut-off) valves may be required, dependant on local regulations or the degree of risk involved.

A weekly visual check must be made on all fasteners / fixing screws securing mechanical parts. In particular, safety-related parts such as coupling hitch, drawbar components, road-wheels, and lifting bail should be checked for total security.

All components which are loose, damaged or unserviceable, must be rectified without delay.

Electricity

The human body has a low tolerance for electricity and is a very good conductor. Exposure to electrical shock can result in an interruption of normal heart activity, thermal burns, severe muscle contractions and even death.

Never operate the generator without all protections in place. Controller and busbar doors must be closed at any time during operation.

If life testing is necessary, it should only be performed by properly trained people.

While testing on life electrical equipment, rubber sole shoes and adequate rubber gloves must be worn, and all local regulations must be respected.

Materials

The following substances may be produced during the operation of this machine:

- engine exhaust fumes

AVOID INHALATION.

Ensure that adequate ventilation of the cooling system and exhaust gases is maintained at all times.

The following substances are used in the manufacture of this machine and may be hazardous to health if used incorrectly:

- anti-freeze
- engine lubricant
- preservative grease
- rust preventative
- diesel fuel
- battery electrolyte

AVOID INGESTION, SKIN CONTACT AND INHALATION OF FUMES.

Should engine lubricants or fuel come into contact with the eyes, then irrigate with water for at least 5 minutes.

Should engine lubricants or fuel come into contact with the skin, then wash off immediately.

Consult a doctor if large amounts of engine lubricants or fuel are ingested.

Consult a doctor if engine lubricants or fuel are inhaled.

Never give fluids or induce vomiting if the patient is unconscious or having convulsions.

Safety data sheets for engine lubricants and fuel should be obtained from the lubricant supplier.

Battery

Batteries contain corrosive liquid and produce explosive gas. Do not expose to naked lights. Always wear personal protective clothing when handling. When starting the machine from a slave battery ensure that the correct polarity is observed and that connections are secure.

DO NOT ATTEMPT TO SLAVE START A FROZEN BATTERY SINCE THIS MAY CAUSE IT TO EXPLODE.

Radiator

Hot engine coolant and steam can cause injury. Ensure that the radiator filler cap is removed with due care and attention.

Transport

When loading or transporting machines ensure that the specified lifting and tie down points are used.

OPERATING INSTRUCTIONS

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OPERATING INSTRUCTIONS

Never operate unit without first observing all safety warnings and carefully reading the operation & maintenance manual shipped from the factory with this machine.

COMMISSIONING

Upon receipt of the unit, and prior to putting it into service, it is important to adhere strictly to the instructions given below in *PRIOR TO STARTING*.

Ensure that the operator reads and *understands* the decals and consults the manuals before maintenance or operation.

Ensure that the position of the *emergency stop* device is known and recognised by its markings. Ensure that it is functioning correctly and that the method of operation is known.

Attach the battery cables to the battery(s) ensuring that they are tightened securely. Attach the negative cable before attaching the positive cable.

The operating controls and instruments are arranged on the control panel as shown. A description of each panel device is as follows:

Ensure that all transport and packing materials are discarded.

Ensure that the correct fork lift truck slots or marked lifting / tie down points are used whenever the machine is lifted or transported.

When operating the machine ensure that there is sufficient clearance for ventilation and exhaust requirements, observing any specified minimum dimensions (to walls, floors etc.).

Adequate clearance needs to be allowed around and above the machine to permit safe access for specified maintenance tasks.

Ensure that the machine is positioned securely and on a stable foundation. Any risk of movement should be removed by suitable means, especially to avoid strain on any rigid discharge piping.

CONNECTING THE LOAD

Make sure the wires are not cracked or damaged in any way.

Connect the proper phase wire to its corresponding bar L1–L2–L3. Mixing phases connections can result in equipment damage, accidents causing injuries or even death.

Always use the 5 connections, 3 phases, neutral and earth.

Make sure your installation is in compliance with local regulations.

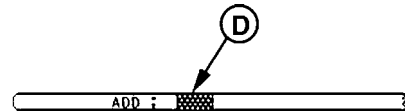
PRIOR TO STARTING

Before starting the engine, carry out the following checks:

1. Engine oil level: Add as required.



DO NOT fill above the top mark on the dipstick. Oil levels anywhere within crosshatch (D) are considered in the acceptable operating range.



2. Engine coolant level: Add as required.
3. Fuel filter: Drain any accumulation of water. Clean or replace element as required.
4. Air cleaner service indicator (if equipped): Service immediately if showing "red" when the engine is running.
5. Fuel level in tank: Fill, using CLEAN DIESEL fuel, at the end of the day to minimise condensation.
6. Battery: Keep terminals clean and lightly greased.
7. Engine belts and hoses: Check for proper fit and / or damage. Service as required.
8. Air Vents / Grilles: Both engine radiator and generator cooling air. Check for obstructions (leaves, paper, etc.).
9. Visual inspection: Check for excessive fluid leaks, evidence of arcing around control panel, loose wire-routing clamps, etc.



Call a qualified person to make electrical repairs.



Do not remove the cap from a HOT engine radiator. The sudden release of pressure from a heated cooling system can cause severe injury or death.

STARTING



Use the **EMERGENCY STOP** button **ONLY** in the event of an emergency.

NEVER use it for normal shut-down.

Verify the following:

1. All external electrical power loads are turned "OFF".
2. Main Breaker is "OFF".
3. Battery Disconnected Switch is "ON".
4. Reset (pull to unlatch) Emergency Stop Button.
5. Push the controller "START" Button.
6. Wait for preheating if enabled.



Do **NOT** use engine starting fluids.



POWER is present upon cranking the engine.



Allow starter to cool for one minute between start attempts.

If engine shuts down, diagnostic lamps will indicate the problem. Correct the problem before continuing.

7. Allow the engine to warm-up for 3 to 5 minutes.
8. Check the CONTROL Panel for proper voltages. No RED diagnostic lamps should be glowing.
9. With main breaker "ON" power is present and available for use.
10. Close side doors for optimum cooling of the unit while running.

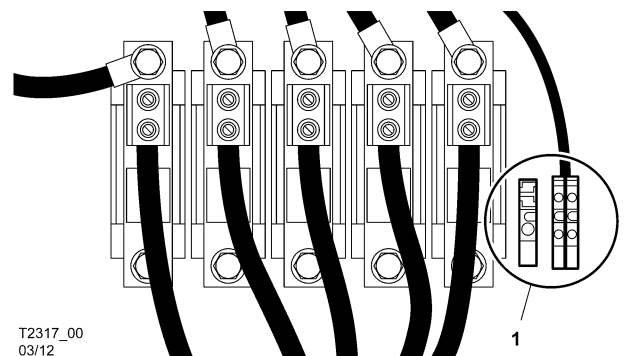
STOPPING

1. Turn off all external electrical power loads.
2. Turn Main Breaker "OFF".
3. Allow 5 minute cool down.
4. Push controller "STOP" Button.
5. Wait at least 15 seconds before restarting.
6. Fill fuel tank at end of working day to prevent condensate.

REMOTE STARTING AND STOPPING (ANALOG CONTROLLER)

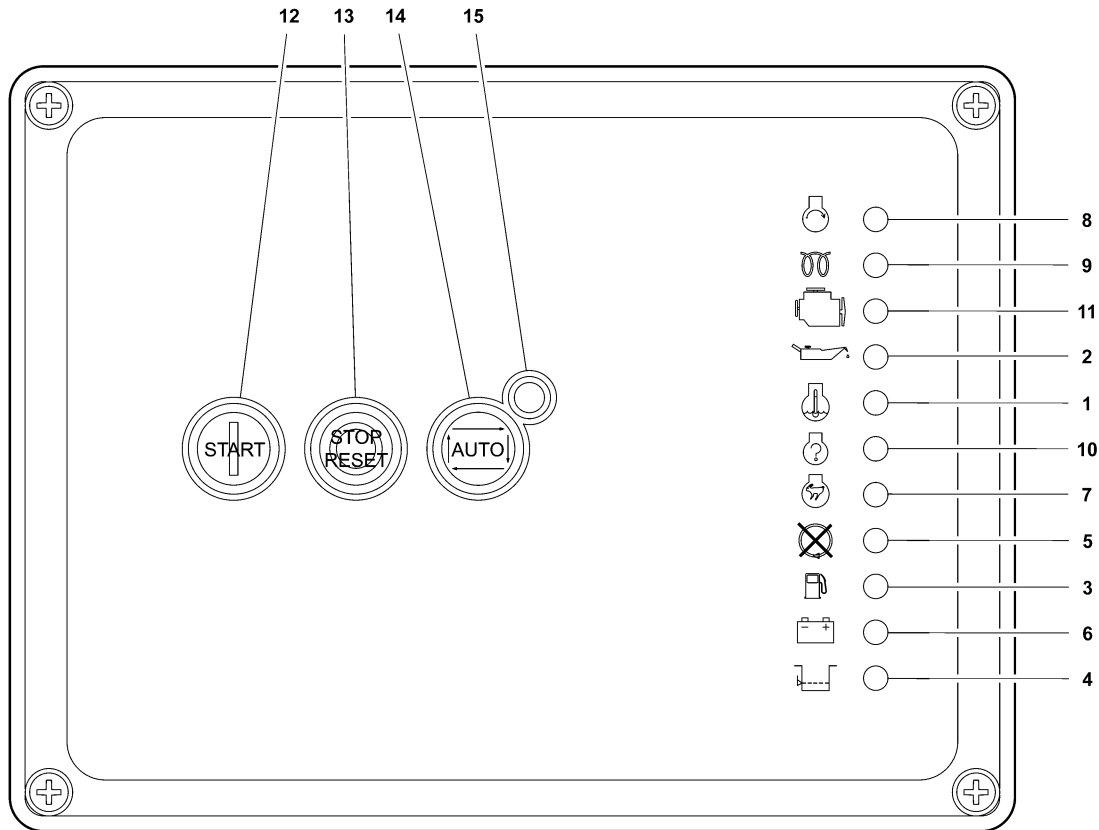
1. Connect the Remote Start contacts (located in the Generator System direct hook-up compartment) to a customer-supplied contact that closes to initiate a genset start.
2. Push the Autostart Mode Switch to illuminate the Autostart Mode LED on control panel.
3. When the customer contact closes, a 10-second alarm will sound prior to each crank cycle until the engine starts. Preheating will also occur if enabled.
4. The engine will stop when the customer-supplied contact opens, and the controller will return to Auto Start Mode.

Figure 1



1. Autostart connections

Figure 2

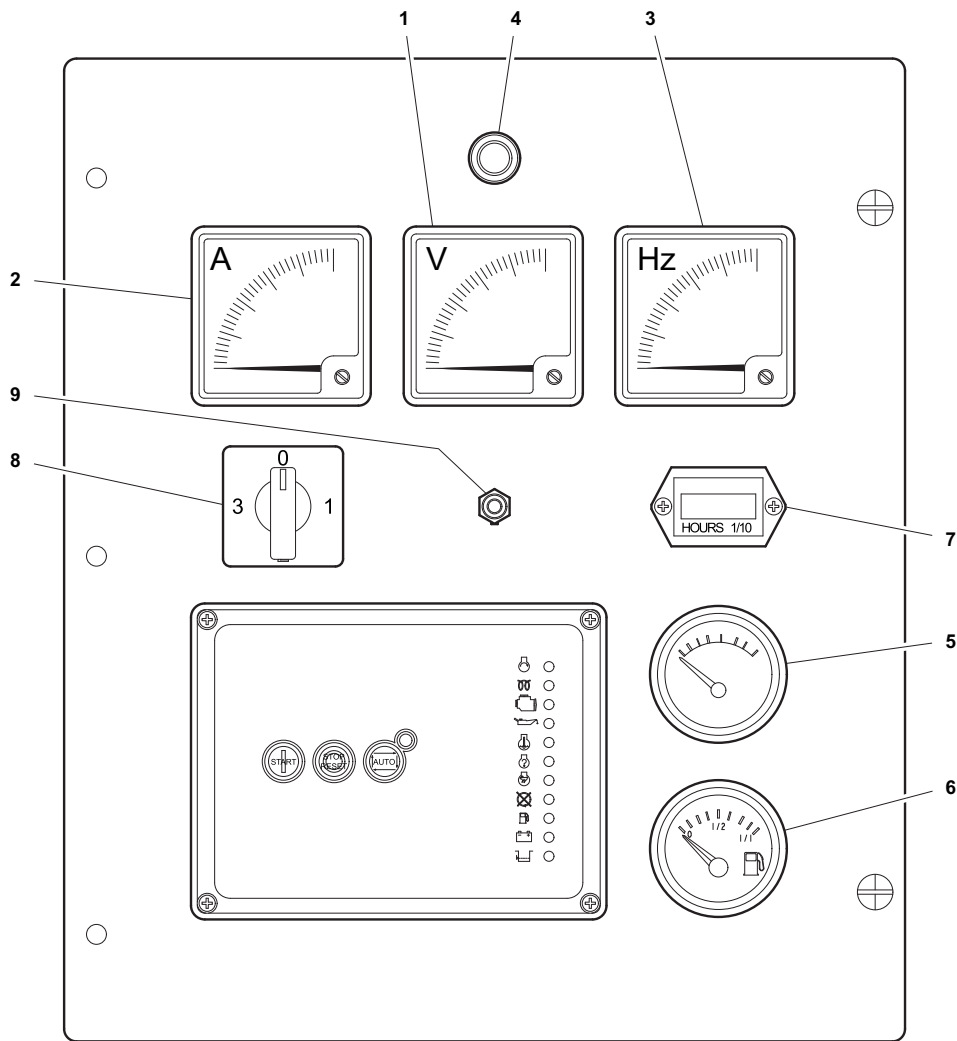


The operating controls and instruments are arranged on the control panel as shown. A description of each panel device is as follows:

1. **High Engine Temperature** - Indicates engine shutdown due to high coolant temperature or low coolant level.
2. **Low Engine Oil Pressure** - Indicates engine shutdown due to low engine oil pressure.
3. **Low Fuel Level** - Indicates engine shutdown due to low fuel level.
4. **High Containment Level** - Indicates high level of fluids in the containment base.
5. **Over Crank** - Indicates engine did not start after 3 cranks.
6. **Battery Not Charging** - Indicates battery voltage is low or not being charged.
7. **Engine Speed** - Indicates engine overspeed.
8. **Engine Operating** - Indicates engine is cranking or operating.
9. **Preheat** - Indicates preheating is on.
10. **Engine Communication** - Indicates the controller has communication with the engine ECU.
11. **Engine Fault** - Indicates that engine service may be required.
12. **Engine Start Switch.**
13. **Engine Stop / Reset Switch** - Stops engine and resets diagnostics. Also, awakens controller from sleep mode. Wait 15 seconds for reset to complete before attempting start.
14. **Autostart Mode Switch** - Puts engine in Autostart Mode.
15. **Autostart Mode** - Indicates genset is in Autostart Mode. Note: the controller will enter low power sleep mode after a short time and all other LED's will go off.
16. **Emergency Stop Switch** - Disables running, cranking, and trips main breaker. (Not shown.)
17. **Alarm Horn** - Sounds prior to a start when in Auto Start Mode. (Not shown.)

GENERATOR CONTROL PANEL (ANALOG CONTROLLER)

Figure 3



Meters

- 1. **AC VOLTS** - Indicates the generator output voltage.
- 2. **AC AMPERES** - Indicates the generator load in amperes corresponding to AMPERAGE OUTPUT MONITOR switch position.
- 3. **Hertz** - Indicates frequency of generator output.
- 4. **Panel Lamp** - Illumination only.
- 5. **Battery Voltage** - Indicates battery charging voltage.
- 6. **Fuel** - Indicates fuel level in tank.
- 7. **Hourmeter** - Records running time for maintenance.

Monitor Switches

- 8. **Amperage Output** - Selects the line (phase) amperage to be displayed on the AC Ammeter.
- 9. **Voltage Adjust Potentiometer** - Turn to adjust generator output voltage.

Protection / Regulation

- 10. **3 Phase Direct Hookup Connections** - L1, L2, L3, N (neutral), PE (Protective Earth). (Not shown.)
- 11. **Fuse Holders** - Fuses for voltage output meter. (Not shown.)
- 12. **Residual Current Release Device (RCD)** - Provides earth leakage protection. (Not shown.)
- 13. **Main Circuit Breaker** - (Not shown.)
- 14. **Alarm Horn** - (Not shown but is located on back of control box.)

VOLTAGE ADJUSTMENT RANGE	
Line - Neutral	Line - Line
L1-N, L2-N, L3-N	L1-L2, L1- L3, L2 - L3
207V - 253V	360V - 440V

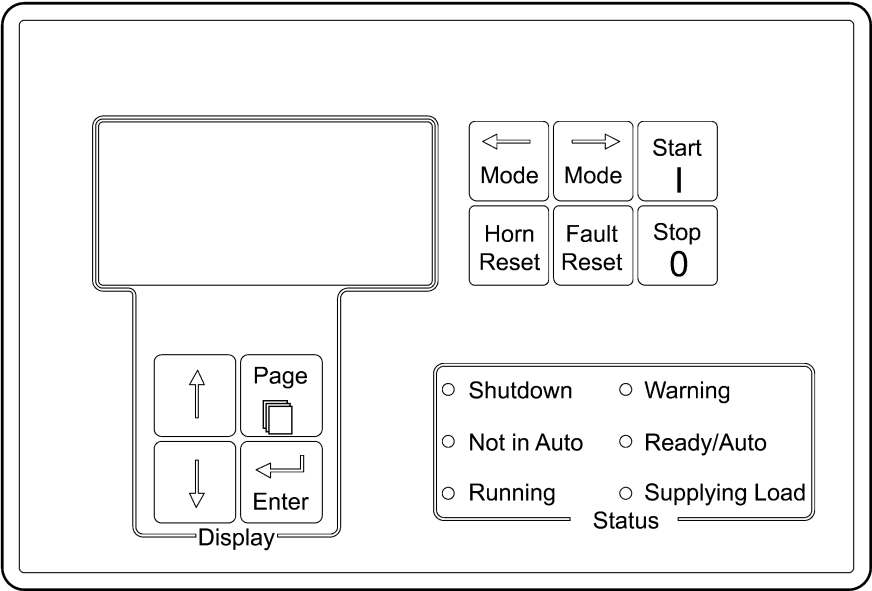
OPTIONS

BASIC DIGITAL CONTROLS OPERATION

Overview

Doosan's Digital Controller is a comprehensive generator set controller that is used as the primary interface between the operator and the generator set. It provides a high degree of engine and generator protection. Multiple real-time parameters can also be viewed. The parameters include, but are not limited to kW, KVA, kVAr, power factor, oil pressure, coolant temperature, engine speed, and diagnostic history.

Figure 4



IDENTIFYING KEYPAD BUTTONS AND INDICATORS

Operation Buttons



Press this button to START the generator set.



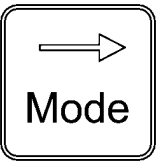
Press this button to STOP the generator set.



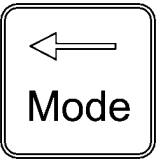
Press this button to deactivate the horn.



Press this button to clear inactive faults.



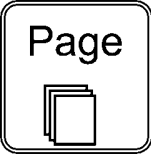
Use this button to scroll the generator operation mode from OFF-MAN-AUT.



Use this button to scroll the generator operation mode from AUT-MAN-OFF.

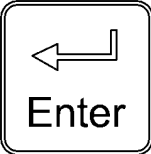
OPTIONS [CONT'D]

Display Buttons



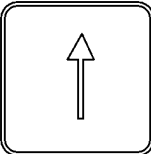
Page

Use this button to scroll the display between the measurement screen, adjustment screen and the default screen. Use it also to back out of the screens.

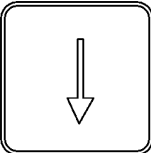


Enter

Use this button to select an adjustment parameter and to confirm proper adjustment.



Use this button to INCREASE setpoint values and to scroll up the adjustment menu.



Use this button to DECREASE setpoint values and to scroll down the adjustment menu.

Status L.E.D.S

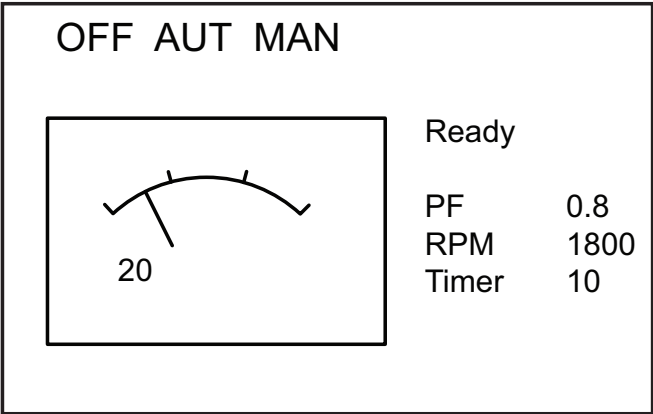
- Shutdown** - Indicates the generator set has shutdown due to a fault.
- Not in Auto** - Indicates that the generator set operation mode is not in the automatic position.
- Running** - Indicates that the generator set is running.
- Warning** - Indicates that the generator set is operating in a condition outside its normal operational parameters.
- Ready / Auto** - Indicates the generator set is ready and is in automatic mode.
- Supplying Load** - Indicates that the generator set is under load.

VIEWING REAL-TIME DATA - ACCESSING THE SCREENS

Press the PAGE button until you reach the primary operational screen.

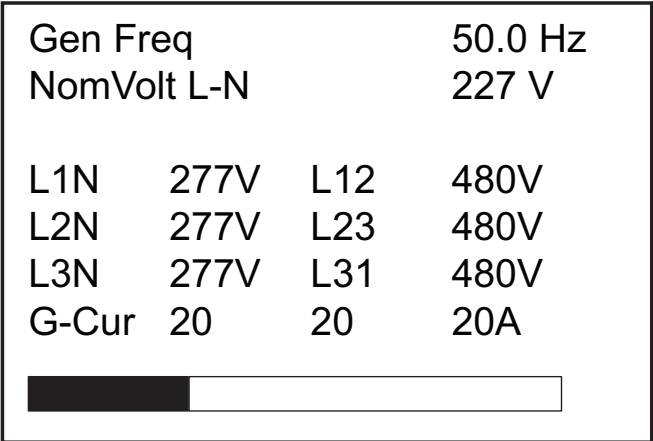
Use the INCREASE and DECREASE buttons to scroll between screens.

Figure 5



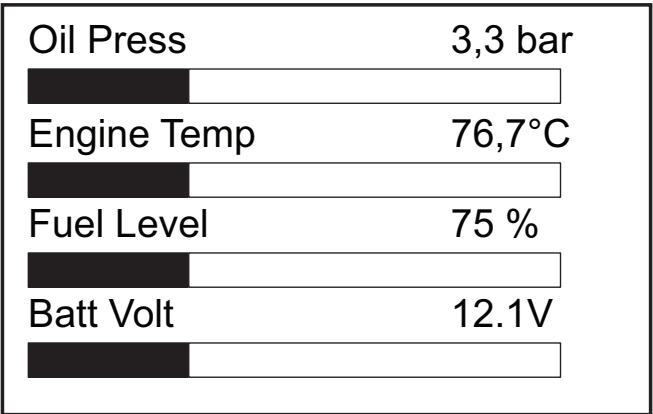
This is the primary operational screen which identifies the status of the generator set along with the generator kW, power factor, and engine RPM.

Figure 6



This screen displays electrical values of the generator set. These values include frequency, line voltages, phase voltages, and current per phase.

Figure 7



This screen displays the engine operational data of the generator set.

OPTIONS [CONT'D]

Figure 8

BIN	I000000
Rem Start/Stop	I
Low Coolant	0
Emergency Stop	0
Low Fuel	0
Full Basin	0
Voltage Select	0
VSS Door	0

This screen displays the status of the binary inputs of the controller. "I" indicates that an input has changed state and "0" indicates no change of state.

Figure 9

BOUT	0000I00
Starter	0
Fuel Solenoid	0
Fuel Pull Coil	0
Glow Plugs	0
IL Power	I
Horn	0
GCB Trip	0

This screen displays the status of the outputs of the controller. "I" indicates that an output has changed state and "0" indicates no change of state.

Figure 10

ECU State	000
ECU Yellow Lamp	0
ECU Red Lamp	0
Wait to Start	0

This screen is ONLY shown on Engines utilising J1939 engine communications. Indication of faults / shutdowns from the engine control unit is shown here. The ECU Yellow Lamp indicates an engine warning and the ECU Red Lamp indicates an engine shutdown.

Figure 11

ECU Values	
Oil Pressure	xxxxx
Water Temp	xxxxx
Perc Load ATCS	xxx
Boost Pressure	xxx
Manifold Temp	xxxxx
Fuel Rate	xxxxx

This screen is ONLY shown on engines utilising J1939 engine communications. The data is sent from the engine ECU.

Figure 12

Act Power	0kW
0	0
Pwr factor	0.00
0.00	0.00
React pwr	0kVAr
0	0
Appar Pwr	0kVA
0	0

OPTIONS [CONT'D]

This screen displays the load parameters of the generator set in terms of active power, power factor, reactive power, and apparent power. These values are indicated in total and per phase.

Figure 13

Run Hours	0	h
NumStarts	0	
E-Stop	0	
Shutdown	0	
KW hours	0	
KVAr hours	0	
Next Srv Time	250	h

This screen displays operational information of the generator set in terms of run hours, number of starts, number of e-stops, and shutdowns, kW hours, kVAr hours. Also shown is a definable parameter for service intervals.

Figure 14

ECU Alarm List					
>					
FC	0	OC	0	FMI	0

This screen is ONLY shown on engines utilising J1939 Communications. The SPN and FMI diagnostic codes are shown here as sent from the engine ECU. These Faults are non latching and are not present when the Fault is not present. A full listing of Fault Codes is shown at the end of this manual.

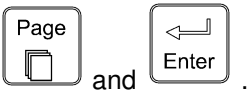
Figure 15

Alarm List	2
Not in Auto	
Wrn Coolant Level	

This screen displays the alarm / shutdown list of the generator set. Inactive faults can be cleared by pressing the "Fault Reset" button. Up to eight faults can be displayed on this screen and are "first-in-first out".

CHECKING SOFTWARE VERSION / LAMP TEST

To check the software version and to test the operation of the LEDs on the control panel, simultaneously press



ADJUSTING THE CONTRAST ON THE DISPLAY SCREEN

To adjust the contrast on the display screen, simultaneously press "ENTER" and "INCREASE" or "DECREASE" to increase or decrease the contrast.

PARAMETER ADJUSTMENTS VIA KEYPAD

Press the "PAGE" button until you reach the parameter adjustment menu.

Use the "INCREASE" and / or "DECREASE" buttons to scroll through the parameter menus.

Figure 16

Parameters Adjust Menu
> Password
Basic settings
Engine params
Engine protect
Gener protect
Date/Time
Sensors spec
I/O Module

OPTIONS [CONT'D]

Press "ENTER" to select the desired parameter menu.

Use the "INCREASE" and / or "DECREASE" buttons to scroll to the parameter to be adjusted.

Press "ENTER" to select the parameter to be adjusted.
Note: Parameters preceded by an asterisk (*) require password access.

Use the "INCREASE" and / or "DECREASE" buttons to increase or decrease the setpoint value.

When the desired setpoint is reached, press "ENTER".

Press the "PAGE" button once to get back to the parameter menu and twice more to go back to the measurement screen.

SETPOINTS DESCRIPTIONS

BASIC SETTINGS

Gen-Set Name

User defined name, used for the CONTROLLER identification at remote phone or mobile connection. The Gen-set name is maximum 14 characters long and has to be entered using Lite Edit software.

Nomin Power (3ph)

Nominal power of the generator in three phase HI-WYE series connection.

Nomin Current

Nominal current of the generator in three phase LOW-WYE parallel connection.

CT Ratio

The generator set current transformer ratio.

PT Ratio

The generator set potential transformers ratio. PTs are not needed on 480 Volt systems and below.

Nominal Voltage 1

Line to neutral voltage in LOW-WYE, Parallel connection.

Nominal Voltage 2

Line to neutral voltage in HI-WYE, series connection.

Gear Teeth

Number of teeth on the engine gear for the pick-up. Set to zero, if no pick-up is used. Engine speed is counted from the generator frequency. Electronic engines get the speed signal from the engine controller.

Alternator Frequency

Frequency of the battery alternator when the controller stops cranking.

Nominal RPM

The nominal engine speed of the generator set.

Mode [OFF, MAN, AUT]

This is the equivalent of controller "Mode" buttons.

Fault Reset Go to Manual

Enables or Disables return to MAN mode when reset is pushed.

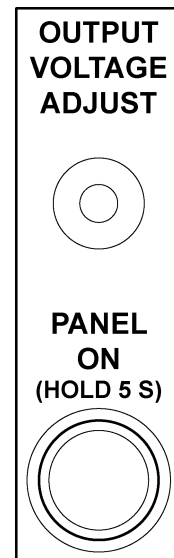
Display Backlight Timeout

The time limit in minutes for the backlight to go off.

IL Power OFF

The time limit in minutes for the controller to go to Sleep Mode. The control power is restored by pushing the "Panel On" button [Figure 17] for 5 seconds.

Figure 17



Controller ADDR

The setting of the controller address.

RS232 Mode

The communication protocol selection.

Standard = Lite Edit

Modbus = Modbus Protocol

Cummins MB = Cummins Modbus Protocol

ENGINE PARAMETERS

Start RPM

"Firing" speed when controller stops cranking (starter goes OFF).

Starting POil

When reached, controller stops cranking (starter goes OFF). There are three conditions for stop cranking: Starting RPM, Starting POil and D+ (when enabled). The starter goes off when any of these conditions are valid.

OPTIONS [CONT'D]

PreHeat Time

The time delay for preheating after the unit gets the start command. The unit begins to start after preheating. Select No Preheat with a setting = 0. Factory default setting = 10 seconds.

MaxCrank time

Maximum time limit of cranking.

Crank Fail Pause

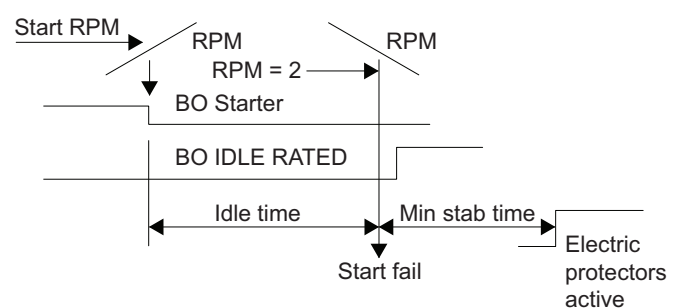
Pause time between crank attempts.

Crank Attempts

Maximum number of crank attempts.

Idle Time

Idle time delay starts when RPM exceeds Start RPM. Start fail is detected when during idle state RPM decrease below 2.

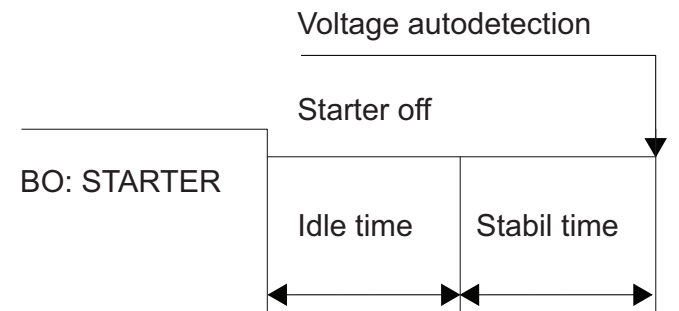


Min Stability Time

Generator nominal voltage starts being detected after starter is switched off, idle time elapses, and this time has elapsed.

Max Stability Time

If generator nominal voltage is not stable within the time after starter is OFF and idle time elapses, then the genset will shutdown. Stability means that voltage and frequency are within warning setting limits.



Cooling Speed

This function is not used. Reserved for future applications. Factory default setting = NOMINAL.

Cooling Time

Runtime of the unloaded generator set to cool the engine before stop.

After Cool Time

This function is not used. Factory default setting = 0.

Stop Time

When genset stop sequence is initiated, fuel solenoid output cannot activate during this time.

Fuel Solenoid

Determines behavior of the Binary output FUEL SOLENOID.

DIESEL: Output closes together with Binary output STARTER.

The output opens if Emergency stop comes or Cooled generator set is stopped or in pause between repeated starts.

GAS: Output closes together with Binary output IGNITION if RPM is over the 30 RPM (Fix value). Output opens after stop command or in pause between repeated start.

Fuel Pull Coil

Time duration that output Fuel Pull Coil is active. This output is used for momentary activation of a fuel solenoid pull coil.

D+ Function

ENABLED: The D+ terminal is used for both functions - "running engine" detection and charge fail detection.

CHRGFAIL: The D+ terminal is used for charge fail detection only.

DISABLED: The D+ terminal is not used, but still provides flash voltage to battery alternator.

ECU Freq Select

This function is not used. Factory Setting = DEFAULT.

ECU Speed Adjust

This function is not used. Factory Default Setting = 0.

OPTIONS [CONT'D]

ENGINE PROTECTION

Eng prot del [s]

During the start of the generator set, some engine protections have to be blocked (e.g. Oil Pressure). The protections are unblocked after the protection del time. The time starts after reaching START RPM.

Alarm Horn

Three selections possible:

NONE = Horn only sounds for 10 seconds prior to a start in Auto Mode.

SHUTDOWN = Horn sounds for any shutdown and also for an Autostart.

SD+ WARNING = Horn sounds for any alarm or shutdown and also for an Autostart.

Overspeed

Threshold for overspeed protection.

Wrn Oil Press

Warning threshold for low oil pressure.

Sd Oil Press

Shutdown threshold level low oil pressure.

Oil Press Del

Delay for oil pressure warning / shutdown.

Sd Engine Temp

Shutdown threshold level for high engine coolant temperature.

Wrn Engine Temp

Warning threshold level for high engine coolant temperature.

Wrn Eng Temp Low

Warning threshold level for low engine coolant temperature.

Engine Temp Del

Delay for high / low engine coolant temperatures.

Wrn Fuel Level

Warning threshold level for low fuel level.

Sd Fuel Level

Shutdown threshold level for low fuel level.

Fuel Level Del

Delay for low fuel level.

Batt Overvolt

Warning threshold for high battery voltage.

Batt Undervolt

Warning threshold for low battery voltage.

Battvolt del

Delay for low battery voltage alarm.

NextServTime [h]

Counts down when engine running. If reaches zero, an alarm appears.

ALTERNATOR PROTECTION

Overload

Threshold for generator overload (in % of nominal power).

Overload Wrn

Threshold for generator overload warning (in % of nominal power).

Overload del

Delay for generator overload alarm.

Ishort

Shutdown occurs when Ishort circuit limit is reached.

Ishort del

Delay for Ishort Alarm.

2Inom del

IDMT is "very inverse" generator over current protection. 2Inom del is Reaction time of IDMT protection for 200% overcurrent $I_{gen} = 2 \times \text{Nominal current}$.

Curr unbal del

Delay for generator current asymmetry.

Gen >V Sd

Shutdown level for generator over voltage. All three phases are checked. Maximum out of three is used.

Gen >V Wrn

Warning level for generator over voltage. All three phases are checked. Maximum out of three is used.

Gen <V Sd

Shutdown level for generator under voltage. All three phases are checked. Minimum out of three is used.

Gen <V Wrn

Warning level for generator under voltage. All three phases are checked. Minimum out of three is used.

Gen V del

Delay for generator under voltage and over voltage alarm.

Volt unbal

Threshold for generator voltage unbalance alarm.

OPTIONS [CONT'D]

Volt unbal del

Delay for generator voltage unbalance alarm.

Gen >f SD

Shutdown level for generator over frequency.

Gen>f Wrn

Warning level for generator over frequency.

Gen <f Wrn

Warning level for generator under frequency.

Gen <f SD

Shutdown level for generator under frequency.

Gen f del

Delay for generator under frequency and over frequency alarm.

DATE / TIME

Time Stamp Per

Fixed time interval when history of all parameters is recorded. Factory Default Setting = 0.

Summer Time Mod

Automatic time adjustment for daylight savings time.

Time

Time of day setting.

Date

Date setting.

Timer 1 Repeat

Selection of day / days when exercise Timer 1 will run.

Timer 1 on Time

Selection of time of day when Timer 1 will start the genset.

Timer 1 Duration

Selection of length of run time.

Timer 2 Repeat

Selection of day / days when exercise Timer 2 will run.

Timer 2 on Time

Selection of time of day when Timer 2 will start the genset.

Timer 2 Duration

Selection of length of run time.

OPTIONS [CONT'D]

ELECTRONIC REGULATION - G60 SIIIA ONLY

The ELECTRONIC REGULATION option provides for a precise, isochronous, speed regulation, keeping the frequency stable within +/- 0.25%.

This option is factory set and should not be custom set in any way.

Fuel Pump Actuator

Figure 18

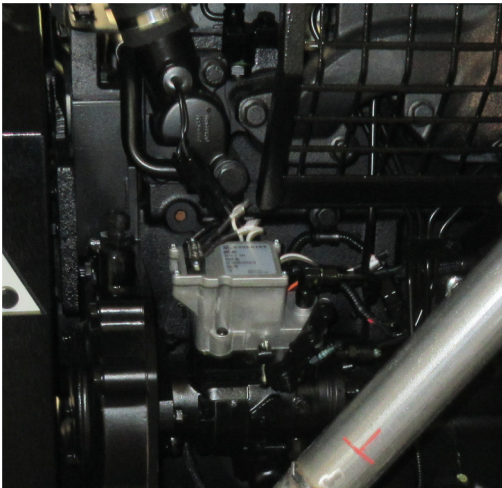
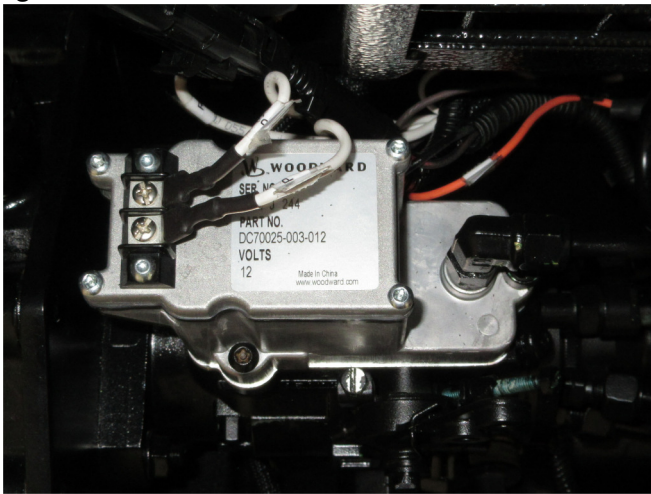


Figure 19



Controller

Figure 20



The CONTROLLER is featuring a diode on the face which displays the controller state:

LED STATE	MEANING
Off	Controller is either not currently powered, or is being reverse powered. (Check polarity of supplied power.) If correctly powered, then controller is malfunctioning.
Blinking Slow (1 / 2 Hz)	Controller is powered, but not sensing a speed signal. OK if engine is not running. If the engine is running, then this indicates a fault with the speed signal.
Blinking Fast (1 ½ Hz)	Controller is powered and an engine speed signal is being detected. If the engine is not running, then this indicates electrical noise on the speed signal wires.
ON and Not Blinking	Controller is powered and is malfunctioning. Replace controller.

OPTIONS [CONT'D]

ELECTRONIC REGULATION - DUAL FREQUENCY
50 / 60 HZ - G60 SIIIA ONLY

The ELECTRONIC REGULATION option provides for a precise, isochronous, speed regulation, keeping the frequency stable within +/- 0.25%.

This option is factory set and should not be custom set in any way.

The dual frequency allows to easily switch from 50Hz to 60 Hz by toggling the frequency switch in the power pedestal.

No further action is required to change frequency.

Fuel Pump Actuator

Figure 21

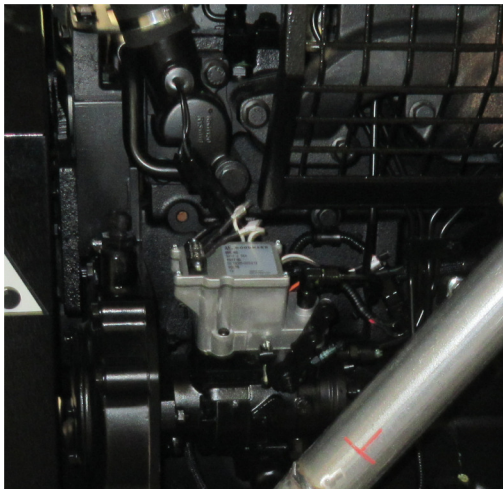
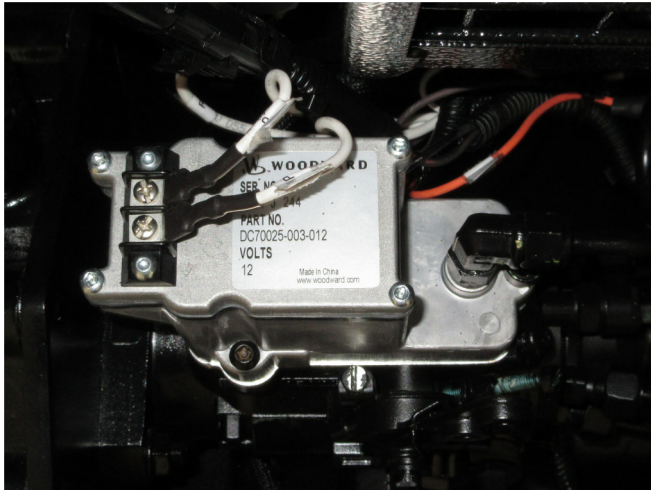
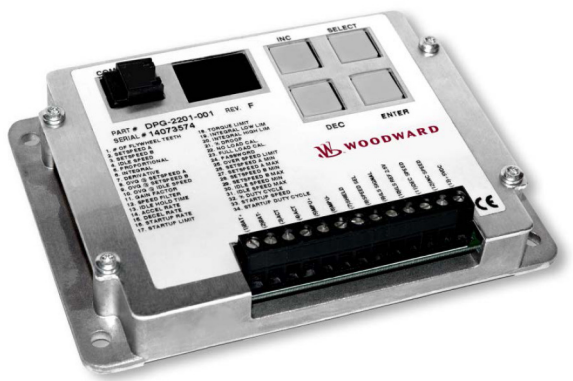


Figure 22



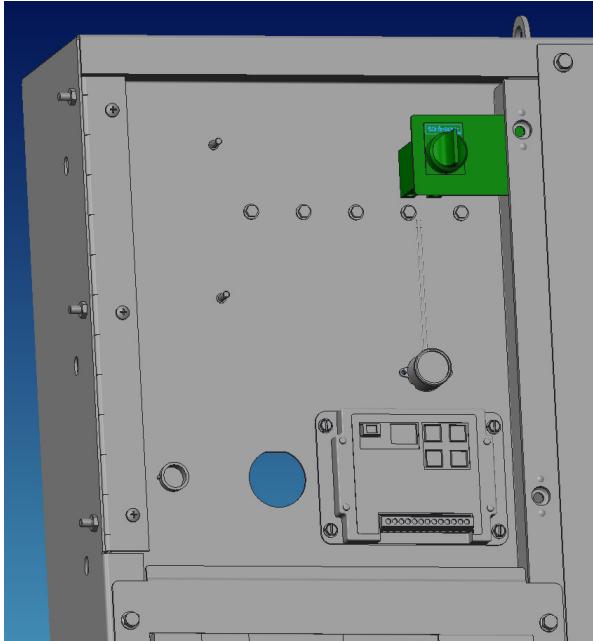
Controller

Figure 23



Dual Frequency Switch

Figure 24



OPTIONS [CONT'D]

3-WAY FUEL VALVE

This machine may be equipped with a 3-way fuel valve.

Description

The 3-way fuel valve combined with an external fuel connection module will provide maximum autonomy.

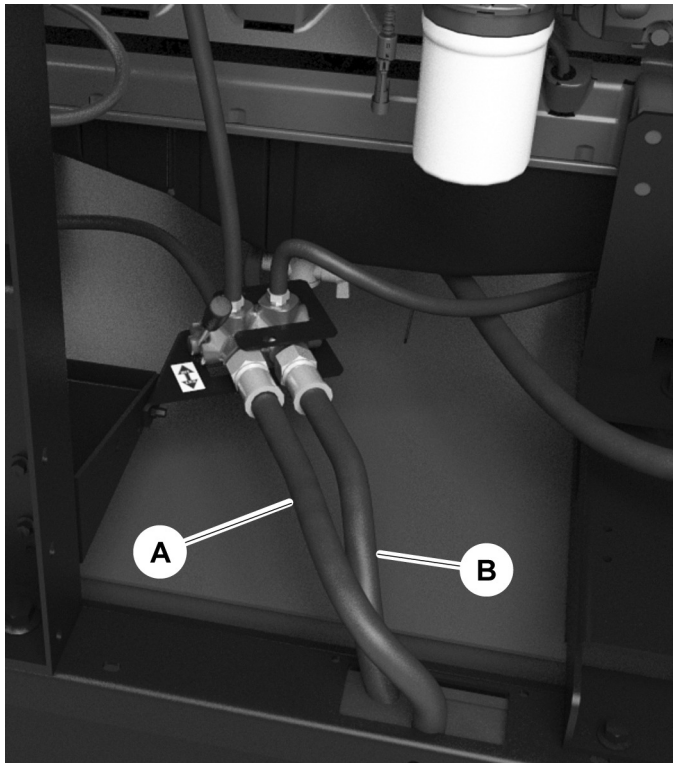
Installation and usage

Connecting directly to 3-way fuel valve block.

Stop the engine.

Connect the external fuel supply and return hoses to the 3-way fuel valve block. (Thread is 3/8 BSPP).

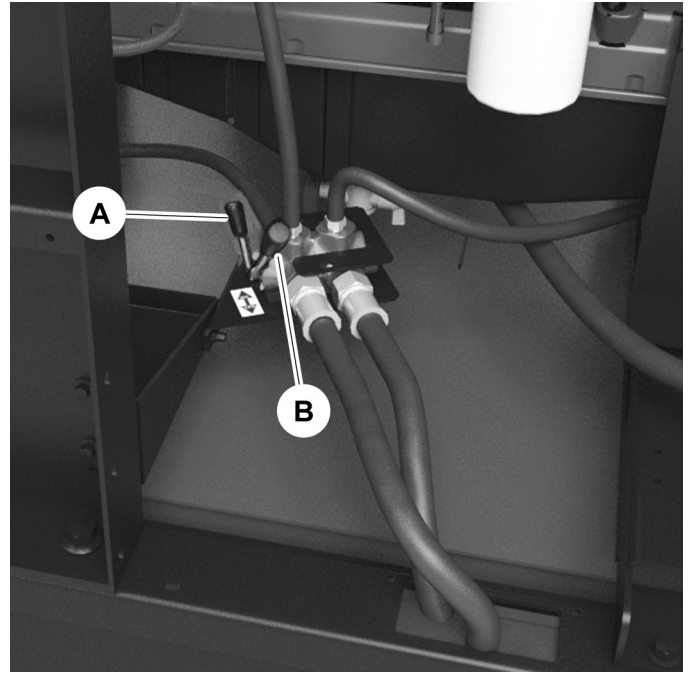
Figure 25: 3-way fuel valve



- A** Fuel supply to engine: "IN"
- B** Fuel return to the external tank: "OUT"

Move the lever to the external fuel tank position

Figure 26: Valve lever position



- A** In-built tank supply
- B** External tank supply

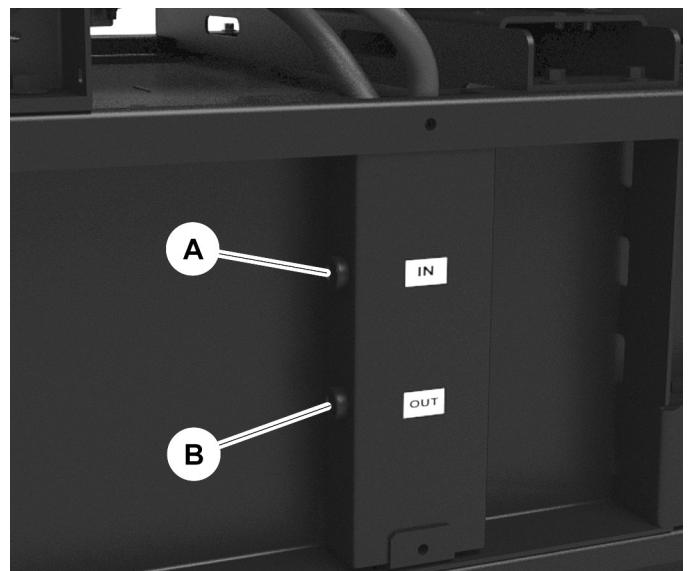
Clean up any spilled fuel.

Connecting to external fuel connection preparation

Stop the engine.

Connect the external fuel supply and return hoses to the external fuel connection. (Thread is 1/2 BSPP).

Figure 27: 3-way fuel valve external connections



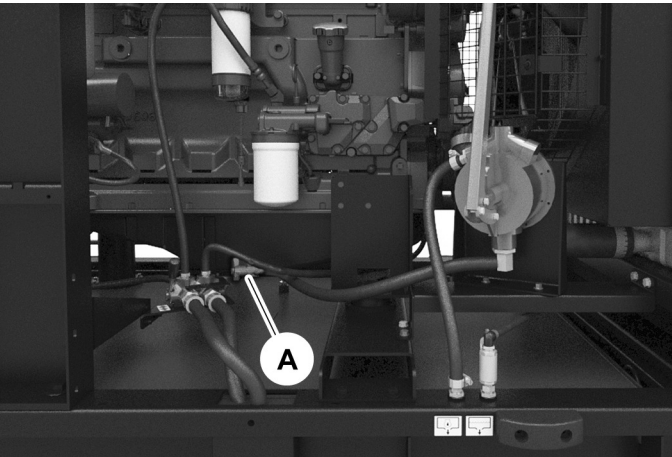
- A** Fuel supply to engine: "IN"
- B** Fuel supply to the external tank: "OUT"

Move the lever to the external fuel tank position.

Clean up any spilled fuel.

OPTIONS [CONT'D]

Figure 28: Oil pan drain



A Oil pan drain valve

OIL SUMP PUMP

This machine may be equipped with an oil sump pump

Description

The oil sump pump allows for easier removing of engine oil.

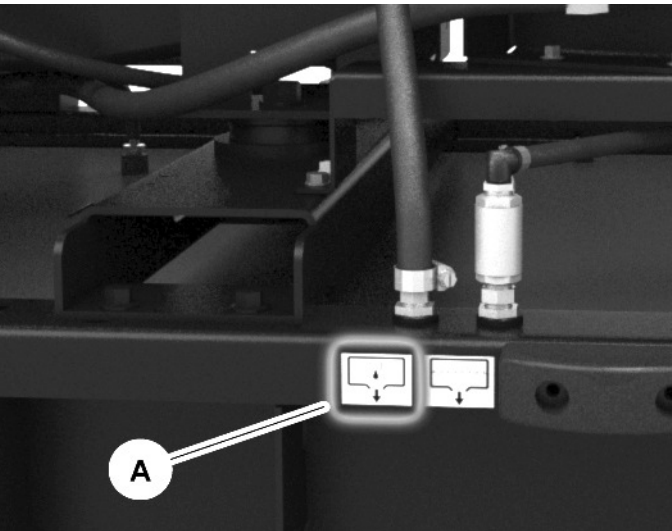
Removing oil

Run the engine until it is at operating temperature.

Stop the engine

Install a hose on the engine oil outlet connection.

Figure 29

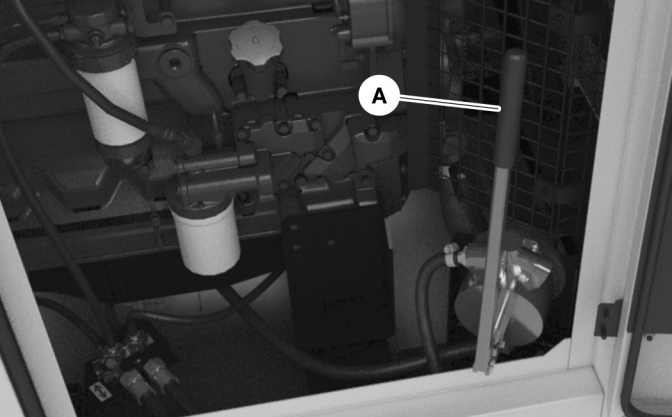


A Engine oil outlet connection

Open the engine oil pan drain valve.

Drain the engine oil using the hand pump.

Figure 30: Hand pump



A Hand pump

Recycle or dispose of used oil in an environmentally safe manner.

Close the engine oil pan drain valve.

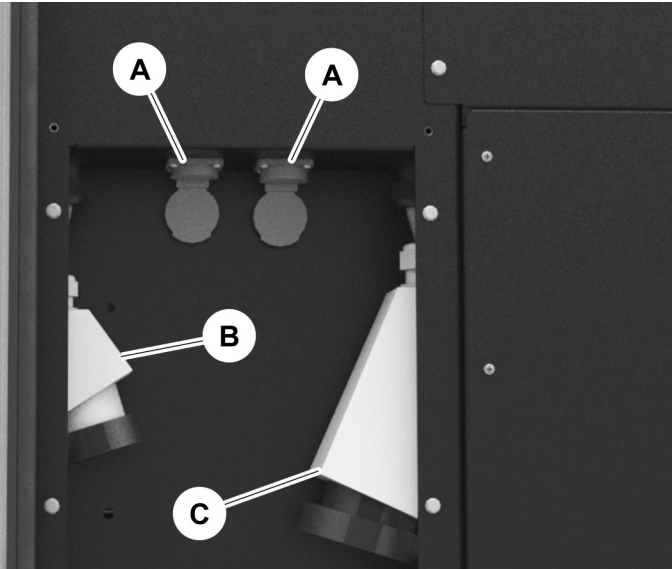


AVOID INJURY OR DEATH

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire.

SOCKET SET - CE

Figure 31: Sockets



- A Sockets 1P 16A
- B Socket 3P 32A
- C Socket 3P 64A

This machine may be equipped with optional sockets as detailed above.

DECOMMISSIONING

When the machine is to be permanently decommissioned or dismantled, it is important to ensure that all hazard risks are either eliminated or notified to the recipient of the machine. In particular:

- Do not destroy batteries or components containing asbestos without containing the materials safely.
- Do not dispose of any pressure vessel that is not clearly marked with its relevant data plate information or rendered unusable by drilling, cutting etc.
- Do not allow lubricants or coolants to be released into land surfaces or drains.
- Do not dispose of a complete machine without documentation relating to instructions for its use.

LONG TERM STORAGE RECOMMENDATIONS (6 MONTHS OR MORE)

- Engine cooling system - Treat with rust inhibitor and drain. Check with engine dealer for further recommendations.
- Seal all opening with waterproof tape.
- Place a desiccant in the exhaust pipes and engine air intake pipes.
- Loosen tension on belts, fan, etc.
- Disconnect battery cables.
- Drain fuel system.

SHORT TERM STORAGE

Machines that set for extended period of time greater than 30 days should:

- Start and operate the machine every 30 days. Operate long enough to allow the engine to reach operating temperature.
- Drain fuel tank to remove any water.
- Drain water from fuel water separator.

MAINTENANCE

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MAINTENANCE INFORMATION



Any unauthorised modification or failure to maintain this equipment may make it unsafe and out of factory warranty.



Before attempting any repair service, disconnect engine battery cables and all leads to electrical power requirements. Failure to do so can result in severe personal injury, death or damage to the equipment.

GENERAL

In addition to periodic inspections, many of the components in this unit requires periodic servicing to provide maximum output and performance. Servicing may consist of pre-operation and post-operation procedures to be performed by the operating or maintenance personnel. The primary function of preventive maintenance is to prevent failure and consequently, the need for repair. Preventive maintenance is the easiest and the least expensive type of maintenance. Maintaining your unit and keeping it clean at all times will facilitate servicing.

SCHEDULED MAINTENANCE

The maintenance schedule is based on normal operation of the unit. In the event unusual environmental operating conditions exist, the schedule should be adjusted accordingly.

Wiring Routing Clamps

Daily check for loose wire routing clamps. Clamps must be secure and properly mounted. Also check wiring for wear, deterioration and vibration abrasion.

Electrical Terminals

Earthing Circuit

Check daily for evidence of arcing around electrical terminals.

Daily check that the earthing circuit is in accordance with the Safety CE Directives, IEC 364-4-41 and the local code requirements. As a minimum, the copper wire size should be 10mm² from the earthing terminal, frame, generator and engine block.

Hoses

Each month it is recommended that the intake hoses from the air cleaner and all flexible hoses used for water and fuel be inspected for the following:

1. All rubber hose joints and the screw type hose clamps must be tight and the hoses showing no signs of wear, abrasion or deterioration.
2. All flexible hoses must be free of wear, deterioration and vibration abrasion. Routing clamps must be secure and properly mounted.

Wiring Insulation

Daily check for loose, or frayed wiring insulation or sleeving.

Fuel / Water Separator

Daily check for water in the fuel filter / water separator unit. Some engines have a translucent bowl for visual indication, and others have a drain valve below the primary element.

Every six months or 500 hours, or less if fuel is of poor quality or contaminated, replace the bowl elements(s).

Air Vents

Daily clean the air vents of any obstruction or debris.

Air Cleaner

Proper maintenance of the air cleaner provides maximum protection against airborne dust. Squeeze the rubber valve (pre-cleaner dirt dump) periodically to ensure that it is not clogged.

To service the air cleaners, proceed as follows:

1. Remove filter element.
2. Inspect air cleaner housing for any condition that might cause a leak and correct as necessary.
3. Wipe inside of air cleaner housing with a clean, damp cloth to remove any dirt accumulation. This will permit better seal for gasket on filter element.
4. Install element.

The air cleaner assembly (housing) should be inspected every 3 months or 500 hours for any leakage paths.

Note: Make sure the inlet is free from obstruction.

Make sure the air cleaner mounting bolts and clamps are tight and the air cleaner is mounted securely. Check the air cleaner housing for dents or damage to the cleaner, which can lead to a leak.

MAINTENANCE

Observe service intervals

Using hour meter as a guide, perform all services at the hourly intervals indicated on following pages. At each scheduled maintenance interval, perform all previous maintenance operations in addition to the ones specified. Keep a record of hourly intervals and services performed using charts provided in Maintenance Records Section.



Recommended service intervals are for normal operating conditions. Service MORE OFTEN if engine is operated under adverse conditions. Neglecting maintenance can result in failures or permanent damage to the engine.

Use correct fuels, lubricants and coolant



Use only fuels, lubricants, and coolants meeting specification outlined in Fuels, Lubricants, and Coolant Section when servicing your John Deere Engine.

Consult your John Deere engine distributor, servicing dealer or your nearest John Deere Parts Network for recommended fuels, lubricants, and coolant. Also available are necessary additives for use when operating engines in tropical, arctic, or any other adverse conditions.

MAINTENANCE INTERVAL CHART

Item	10 H / Daily	Every 2 Weeks	500 H	1000 H / 1 Year	2000H / 2 Years	3000 H / 3 Years	4500 H	As Required
Check engine oil and coolant level	•							
Check air filter restriction indicator ^a	•							
Check fuel filter / water bowl	•							
Operate engine at rated speed and 50—70% load a minimum of 30 minutes ^b		•						
Change engine oil and filter ^c			•					
Replace fuel filter element(s)			•					
Check crankcase vent system			•					
Check engine mounts			•					
Check engine ground connection			•					
Check belt tension and automatic tensioner				•				
Check cooling system				•				
Check air intake system				•				
Replace crankcase vent filter (optional)				•				
Check crankshaft vibration damper (6 cyl.) ^d				•				
Check and adjust engine speed				•				
Drain and flus cooling system ^e					•	•		
Adjust valve clearance					•			
Replace crankshaft vibration damper (6 cyl.)							•	
Bleed the fuel system								•
Clean or replace air filter element (see note a)								•
Replace fan/alternator belt								•
Test thermostat and injection nozzles (see your dealer) ^f								•

^a Clean air filter element when restriction indicator is red. Replace filter element after 6 cleanings or once a year.

^b For standby generator set only.

^c Change oil and filter after the first 100 hours of operation, then every 500 hours maximum thereafter. Change oil and filter at least once a year.

^d Have your authorized dealer or engine distributor replace the vibration damper every 4500 hours/5 years.

^e Drain and flush cooling system every 3000 hours/3 years when John Deere COOL-GARD II coolant is used. Otherwise every 2000 hours/2 years.

^f Contact your dealer when thermostat or injection nozzles are suspected to be defective. Replace injection nozzles every 5000 hours and thermostat every 10000 hours.

MAINTENANCE / DAILY OR EVERY 10 HOURS

CHECK ENGINE OIL LEVEL

Figure 32: Oil Dipstick and Oil Filler Neck

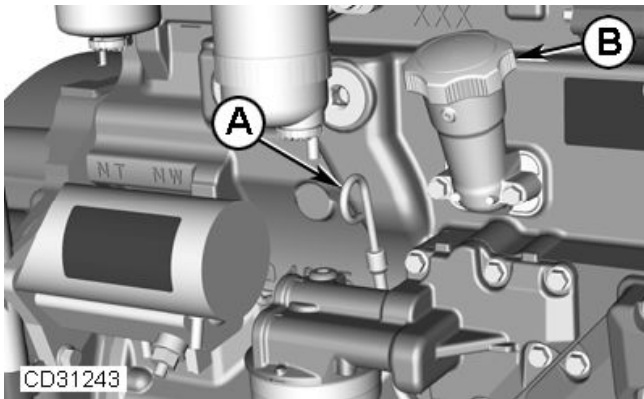
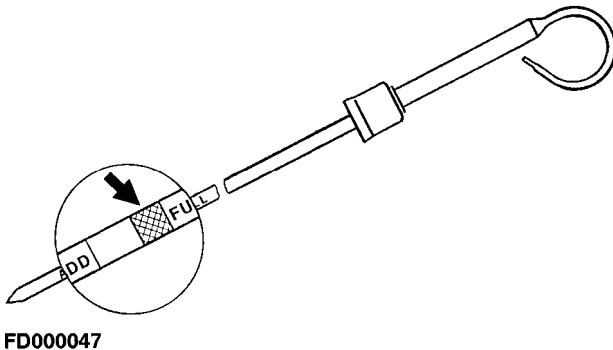


Figure 33: Crosshatch Area on Oil Dipstick



Before starting the engine for the first time of the day, check engine oil level on dipstick (A). Add oil as required, using seasonal viscosity grade oil, at oil filler neck (B).

! CAUTION

DO NOT fill above the crosshatch area. Oil levels anywhere within crosshatch area are considered in the acceptable operating range.

CHECK COOLANT LEVEL



! WARNING

Explosive release of fluid from pressurized cooling system can cause serious burns.

Only remove filler cap when engine is cold or when cool enough to touch with bare hands. Slowly loosen cap first to relieve pressure before removing completely.

Figure 34: Radiator Cap

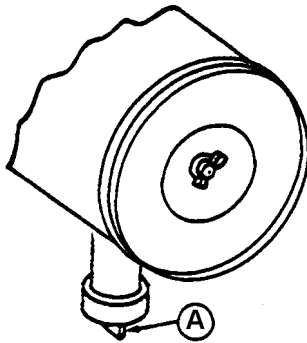


Remove radiator cap (A) and check coolant level which should be at bottom of filler neck. Fill radiator with proper coolant solution if level is low. Check entire cooling system for leaks.

MAINTENANCE / DAILY OR EVERY 10 HOURS (CONT'D)

CHECK AIR FILTER

Figure 35: Check Dust Unloader Valve



CD31247

A Dust Unloader Valve

Figure 36: Check Air Restriction Indicator



CD31248

B Air Restriction Indicator

1. If air filter has a dust unloader valve (A), squeeze valve tip to release any trapped dirt particles.
2. Check air intake restriction indicator (B). When indicator is red, air filter needs to be cleaned.

CAUTION

Maximum air intake restriction is 6.25 kPa (0.06 bar) (1.0 psi) (25 in. H₂O). A clogged air cleaner element will cause excessive intake restriction and reduced air supply to the engine.

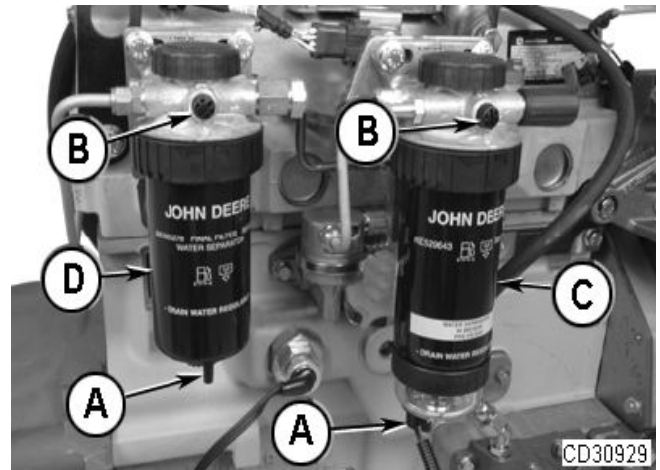
3. Make a thorough inspection of the engine compartment.

NOTE: Wipe all fittings, caps, and plugs before performing any maintenance to reduce the chance of system contamination.

CHECK FUEL FILTER

NOTE: Engines have two fuel filters (primary and final) equipped with a water-in-fuel sensor. Depending on application, an indicator light on the instrument panel will signal the operator that water should be drained from filter bowls.

Figure 37: Drain Water from Fuel Filters



CD30929

- A Drain Plugs
- B Air Bleed Plugs
- C Primary Fuel Filter
- D Final Fuel Filter

Check fuel filter (C) and (D) daily for water or debris and drain as necessary.

1. Loosen drain plugs (A) at bottom of both fuel filter two or three turns.
2. Loosen air bleed plugs (B) two full turns and drain water into a suitable container.
3. When fuel starts to drain out, tighten drain plugs securely.
4. Bleed fuel system.

Figure 38: Oil Pan Drain Valve

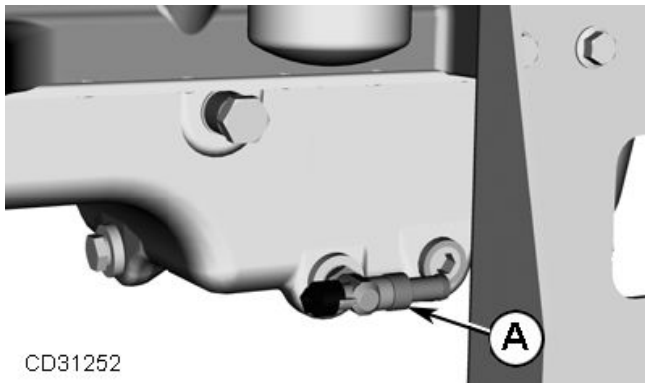


Figure 39: Oil Filter

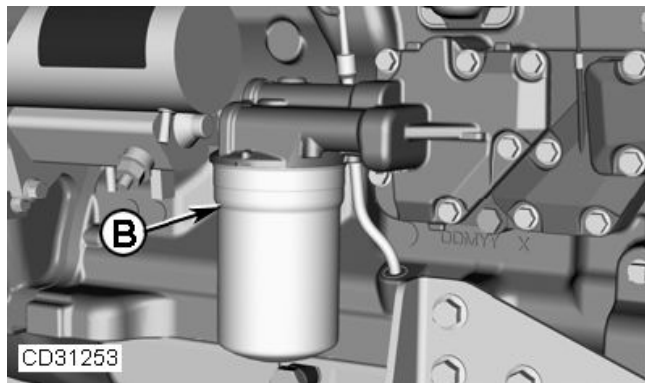
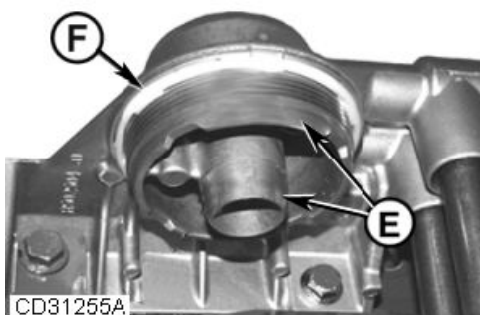


Figure 40: Oil Filter Seals



Figure 41: Oil Filter Header



- A Oil Drain Valve
- B Oil Filter Element
- C Inner Seal
- D Outer Seal
- E Sealing Surfaces
- F Dust Seal

! CAUTION

Filtration of oils is critical to proper lubrication. Always change filter regularly. Use filter meeting John Deere performance specifications

NOTE: Change engine oil and filter for the first time after 100 hours maximum of operation, then every 500 hours thereafter. Change oil and filter at least once a year.

1. Run engine approximately 5 minutes to warm up oil. Shut engine off.
2. Open oil pan drain valve (A).
3. Drain crankcase oil from engine while warm.
4. Replace oil filter as follows:
 - a. Remove and discard oil filter element (B) using a suitable filter wrench.
 - b. Apply clean engine oil to inner (C) and outer (D) seals and to filter threads.
 - c. Wipe both sealing surfaces (E) of the filter header Oil Filter Header with a clean rag. Ensure notches in dust seal (F) are properly installed in the slots in the housing. Replace dust seal if damaged.
 - d. Install and tighten oil filter by hand until it is tight against dust seal (F). DO NOT overtighten.
5. Close oil pan drain valve.

MAINTENANCE / 500 HOURS

CHANGE ENGINE OIL AND FILTER

Figure 42: Oil Filler Cap and Dipstick

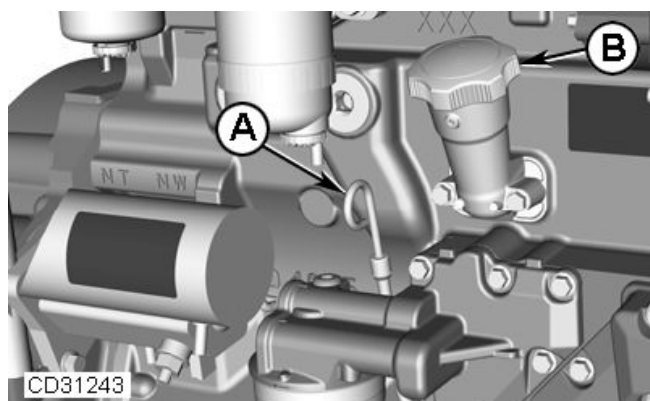
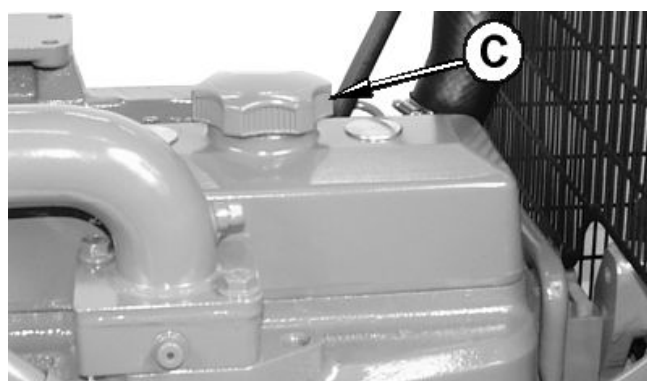


Figure 43: Oil Filler Cap on Rocker Arm Cover



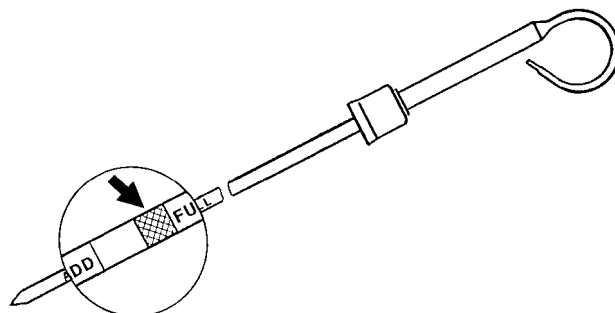
- A** Oil Dipstick
- B** Oil Filler Cap on Side of Arm Cover
- C** Oil Filler Cap on Rocker

6. Fill engine crankcase with correct John Deere engine oil through opening on rocker arm cover (C) or on the side of the engine (B).

To determine the correct oil fill quantity for your engine, see the Specification Section.

NOTE: Crankcase oil capacity may vary slightly. **ALWAYS** fill crankcase to full mark or within crosshatch area on dipstick (A), whichever is present. **DO NOT** overfill.

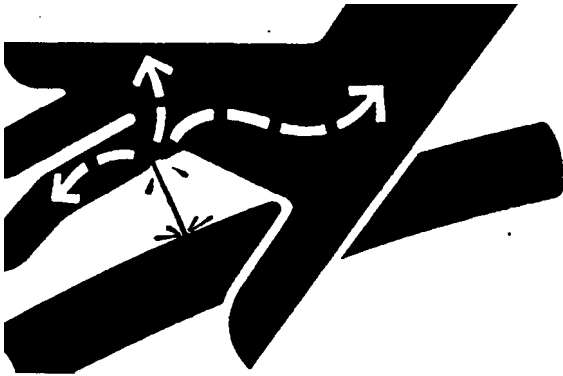
Figure 44: Crosshatch Area on Oil Dipstick



FD000047

7. Start engine and run to check for possible leaks.
8. Stop engine and check oil level after 10 minutes. If necessary, top up.

CHANGE FUEL FILTER ELEMENTS

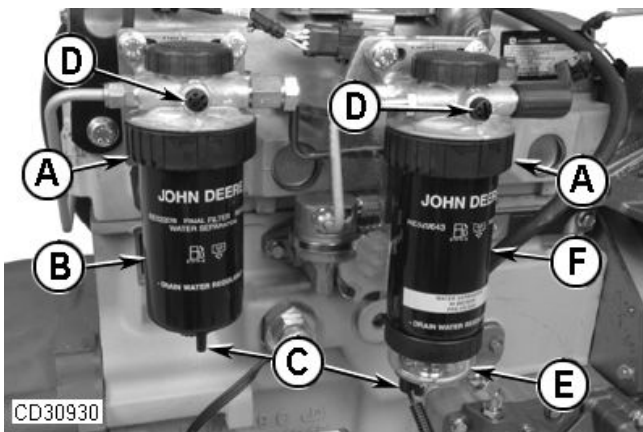


WARNING

Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting fuel or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluid under high pressure. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

If any fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type injury or gangrene may result. Doctors unfamiliar with this type of injury may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

Figure 45: Fuel Filters



- A Retaining Ring
- B Final Fuel Filter Element
- C Drain Plug
- D Bleed Plug
- E Water Separator Bowl
- F Primary Fuel Filter Element

NOTE: Engines are equipped with a primary fuel filter (F) and a final fuel filter (B). Both fuel filters have to be replaced together at the same time.

1. Thoroughly clean fuel filter assembly and surrounding area.
2. Disconnect water-in-fuel sensor wiring.
3. Loosen drain plug (C) and drain fuel into a suitable container.

NOTE: Lifting up on retaining ring as it is rotated helps to get it past raised locators.

4. Firmly grasp the retaining ring (A) and rotate it clockwise 1/3 turn. Remove ring along with filter element (B) or (F).

CAUTION

Do not dump the old fuel into the new filter element. This could cause fuel injection problems.

A plug is provided with the new element for plugging the used element.

5. Inspect filter mounting base for cleanliness. Clean as required.

NOTE: Raised locators on fuel filter canister must be indexed properly with slots in mounting base for correct installation.

6. Install new filter element dry onto mounting base. Be sure element is properly indexed and firmly seated on base. It may be necessary to rotate filter for correct alignment.

If equipped with water separator bowl (E), remove filter element from separator bowl. Drain and clean separator bowl. Dry with compressed air. Install bowl onto new filter element. Tighten securely.

7. Install retaining ring onto mounting base making certain dust seal is in place on filter base. Hand tighten ring (about 1/3 turn) until it "snaps" into the detent. DO NOT overtighten retaining ring.

NOTE: The proper installation is indicated when a "click" is heard and a release of the retaining ring is felt.

8. Bleed the fuel system.

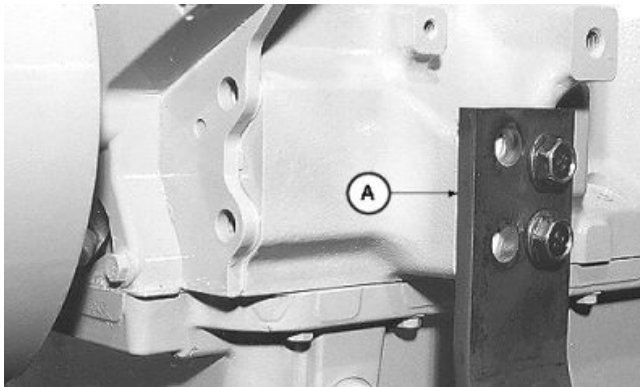
CHECK ENGINE MOUNTS

Engine mounting is the responsibility of the vehicle or generator manufacturer. Follow manufacturer's guidelines for mounting specifications

CAUTION

Use only Grade SAE 8 or higher grade of hardware for engine mounting.

Figure 46: Engine Mounting



A Mounting Bracket

1. Check the engine mounting brackets (A), vibration isolators, and mounting bolts on support frame and engine block for tightness. Tighten as necessary.
2. Inspect overall condition of vibration isolators, if equipped. Replace isolators, as necessary, if rubber has deteriorated or is crushed due to a loss of elasticity.

Check Engine Electrical Ground Connections

Keep all engine ground connections clean and tight to prevent electrical arcing which can damage engine or electronic components.

CHECK BELT (Engines with Manual Tensioner)

Figure 47: Manual Belt Tensioner

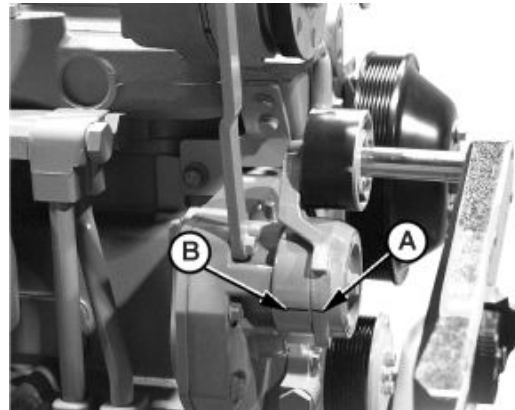
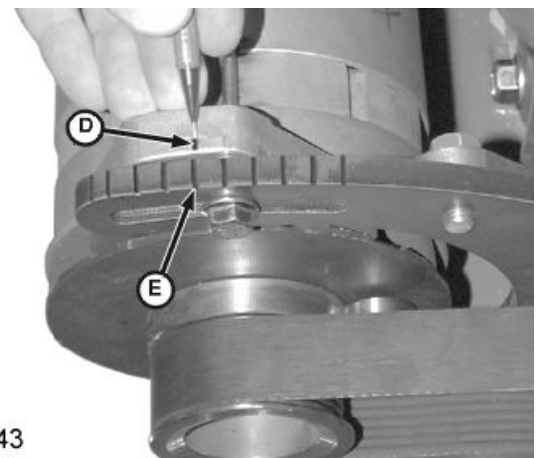


Figure 48: Reference Marks



CD30843

- A Belt Gauge
- B Cap Screw
- C Cap Screw
- D Reference Mark Notch
- E Alternator Upper Bracket

Inspect belts for cracks, fraying, or stretched out areas. Replace if necessary.

NOTE: Belt adjustment is measured using a gauge stamped on the top edge of the alternator bracket.

1. Loosen cap screws (B) and (C).
2. Slide alternator in slot by hand to remove all excess slack in belt. Scribe a reference mark (D) on line with notch (E) on upper alternator bracket.

CAUTION

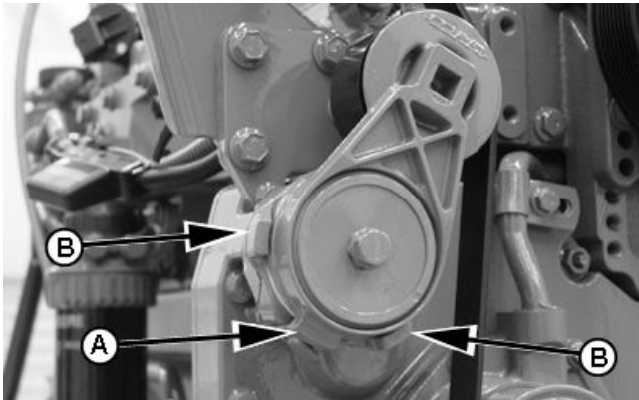
Do not pry against alternator rear frame.

MAINTENANCE / 500 HOURS (CONT'D)

- 3. Using the gauge (A) on the alternator bracket, stretch belt by prying outward on alternator front frame. Stretch the belt 1 gauge unit for a used belt and 1.5 gauge units for a new belt.
- 4. Tighten cap screws (B) and (C).

CHECK BELT (Engines with Automatic Tensioner)

Figure 49: Automatic Belt Tensioner



- A Tensioner Stop
- B Fixed Stop

NOTE: With the belt loosened, inspect pulleys and bearings. Rotate and feel for hard turning or any unusual sounds. If pulleys or bearings need replacement, see your John Deere dealer.

Belt drive systems equipped with automatic (spring) belt tensioners cannot be adjusted or repaired. The automatic belt tensioner is designed to maintain proper belt tension over the life of the belt. If tensioner spring tension is not within specification replace tensioner assembly.

Check belt wear

The belt tensioner is designed to operate within the limit of arm movement provided by the cast stops (A and B) when correct belt length and geometry is used. If the tensioner stop on swing arm (A) is hitting the fixed stop (B), check mounting brackets (alternator, belt tensioner, idler pulley, etc.) and the belt length. Replace belt as needed (see Replace Fan and Alternator Belt, Maintenance/As Required Section).

Check tensioner spring tension

Figure 50: Marks on Tensioner

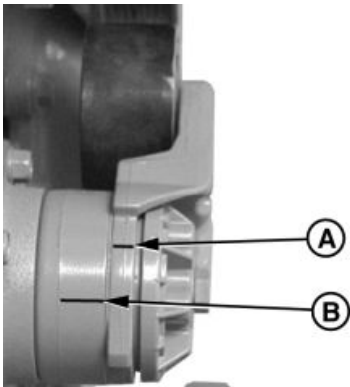
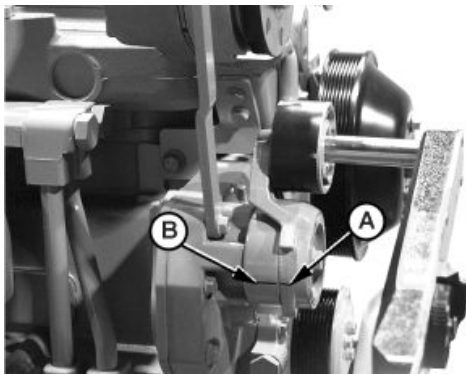


Figure 51: Align Marks



- A Mark on Swing Arm
- B Mark on Tensioner Mounting Base

A belt tension gauge will not give an accurate measure of the belt tension when automatic spring tensioner is used. Measure tensioner spring tension using a torque wrench and procedure outlined below:

1. Release tension on belt using a long-handled 1/2 inch drive tool in tensioner arm. Remove belt from pulleys.
2. Release tension on tensioner arm and remove drive tool.
3. Put a mark (A) on swing arm of tensioner as shown.
4. Measure 21 mm (0.83 in.) from mark (A) and put a mark (B) on tensioner mounting base.
5. Install torque wrench in square hole so that it is aligned with center of roller and tensioner as shown. Rotate the swing arm using a torque wrench until marks (A and B) are aligned.
6. Record torque wrench measurement and compare with specification below. Replace tensioner assembly as required.

SPECIFICATIONS	
Spring—Force	18—22 N·m (13—16 lb.-ft.)

CHECK COOLING SYSTEM

!

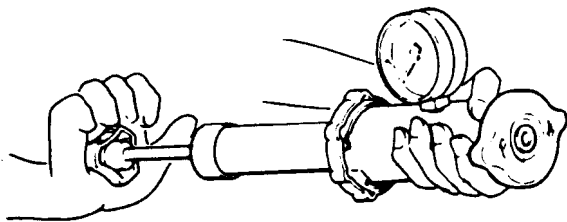
WARNING

Explosive release of fluid from pressurized cooling system can cause serious burns.

Shut off engines. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

Test Radiator Cap

Figure 52: Test Radiator Cap



- 1. Remove radiator cap and attach to D05104ST tester as shown.
- 2. Pressurize cap to specification listed. Gauge should hold pressure for 10 seconds within the normal range if cap is acceptable.

If gauge does not hold pressure, replace radiator cap.

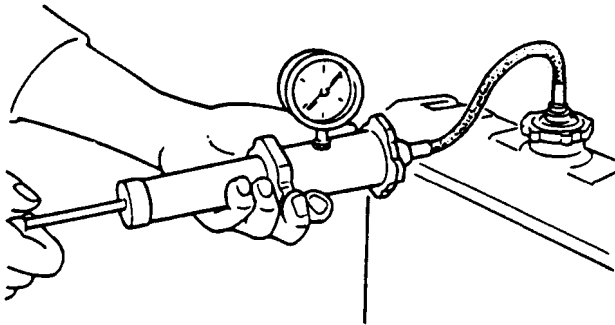
SPECIFICATIONS	
Radiator Cap	
Calibration—Pressure	100 kPa (1.00 bar) (14,5 psi) for 10 seconds minimum

- 3. Remove the cap from gauge, turn it 180°, and retest cap to confirm measurement.

Test Cooling System

NOTE: Engine should be warmed up to test overall cooling system.

Figure 53: Test Radiator Cap



- 1. Allow engines to cool, then carefully remove radiator cap.
- 2. Fill radiator with coolant to the normal operating level.

!

CAUTION

DO NOT apply excessive pressure to cooling system, doing so may damage radiator and hoses.

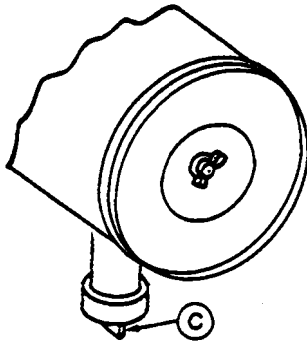
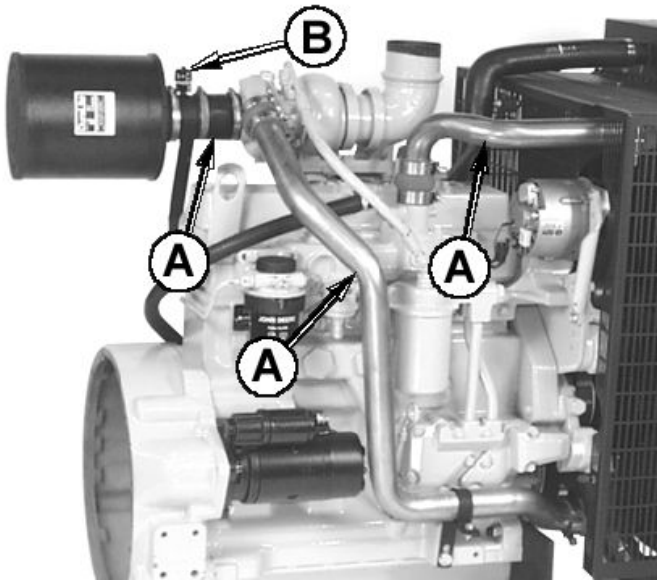
- 3. Connect gauge and adapter to radiator filler neck. Pressurize cooling system to specification listed for radiator cap.
- 4. With pressure applied, check all cooling system hose connections, radiator, and overall engine for leaks.

If leakage is detected, correct as necessary and test system pressure again.

If no leakage is detected, but the gauge indicated a drop in pressure, coolant may be leaking internally within the system or at the block-to-head gasket. Have your engine distributor or servicing dealer correct this problem immediately.

CHECK AIR INTAKE SYSTEM

Figure 54



- A Air Pipes
- B Air Restriction Indicator
- C Dust Unloader Valve

CAUTION

The air intake system must not leak. Any leak, no matter how small, may result in engine failure due to abrasive dirt and dust entering the intake system.

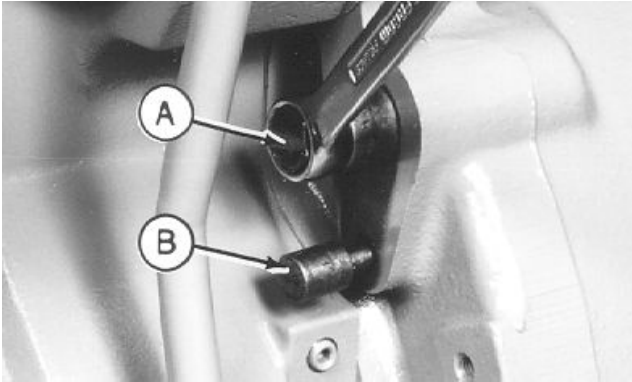
1. Inspect all intake hoses (piping) for cracks. Replace as necessary.
2. Check clamps on air pipes (A) which connect the air filter, engine and, if present, turbocharger and air-to-air radiator. Tighten clamps as necessary.
3. Test air restriction indicator (B) for proper operation. Replace indicator as necessary.
4. If engine has a rubber dust unloader valve (C), inspect the valve on bottom of air filter for cracks of plugging. Replace as necessary.
5. Service air filter as necessary

MAINTENANCE / 2000 HOURS / 2 YEARS

CHECK AND ADJUST ENGINE VALVE CLEARANCE

Adjust engine valve clearance as follows or have your authorized servicing dealer or engine distributor adjust the engine valve clearance.

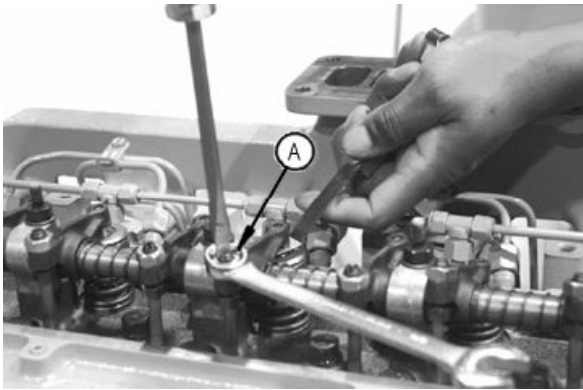
Figure 55: Lock Engine at Top Dead Center



- A Flywheel Turning Tool
- B Timing Pin

1. Remove rocker arm cover and crankcase vent tube.
2. Using JDE83 or JDG820 Flywheel Turning Tool (A), rotate engine flywheel in running direction (clockwise viewed from water pump) until No. 1 piston (front) has reached top dead center (TDC) on compression stroke. Insert timing pin JDG1571 (B) into flywheel bore.

Figure 56: Adjust Valve Clearance



- A Locknut

3. Check and adjust valve clearance to specification according to the following procedure:

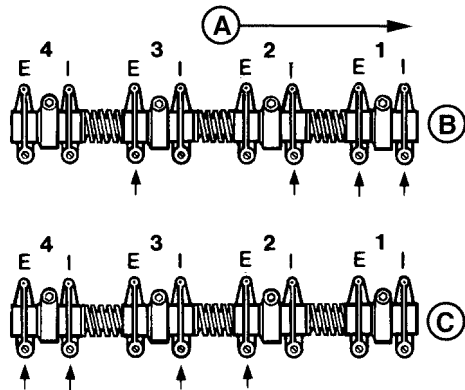
SPECIFICATIONS	
Specification Valve Clearance (Engine Cold)	
Intake	0.35 mm (0.014 in.)
Exhaust.	0.45 mm (0.018 in.)

4. If valves need adjusting, loosen the locknut on rocker arm adjusting screw. Turn adjusting screw until feeler gauge slips with a slight drag. Hold the adjusting screw from turning with screwdriver and tighten locknut (A) to 27N·m(20lb.-ft.). Recheck clearance after tightening locknut. Readjust clearance as necessary.
5. Reinstall rocker arm cover and crankcase vent tube.

4045 Engine:

NOTE: Firing order is 1-3-4-2.

Figure 57: Valve Clearance Adjustment on 4045 Engines



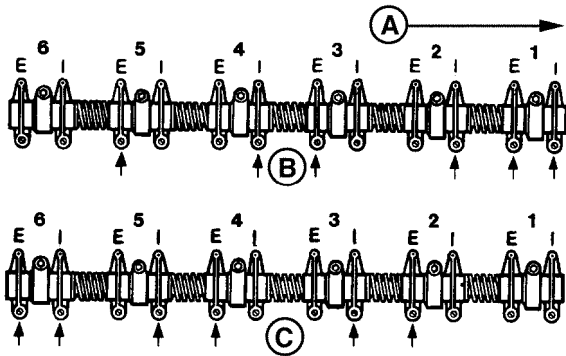
- A Front of Engine
- B No. 1 Piston at TDC Compression Stroke
- C No. 6 Piston at TDC Compression Stroke
- E Exhaust Valve
- I Intake Valve Compression Stroke

1. Lock No. 1 piston at TDC compression stroke (B).
2. Adjust valve clearance on No. 1 and 3 exhaust valves and No. 1 and 2 intake valves.
3. Rotate flywheel 360°. Lock No. 4 piston at TDC compression stroke (C).
4. Adjust valve clearance on No. 2 and 4 exhaust valves and No. 3 and 4 intake valves.

6068 Engine:

NOTE: Firing order is 1-5-3-6-2-4.

Figure 58: Valve Clearance Adjustment on 6068 Engines



- A** Front of Engine
 - B** No. 1 Piston at TDC Compression Stroke
 - C** No. 6 Piston at TDC Compression Stroke
 - E** Exhaust Valve
 - I** Intake Valve Compression Stroke
1. Lock No. 1 piston at TDC compression stroke (B).
 2. Adjust valve clearance on No. 1, 3, and 5 exhaust valves and No. 1, 2, and 4 intake valves.
 3. Rotate flywheel 360°. Lock No. 6 piston at TDC compression stroke (C).
 4. Adjust valve clearance on No. 2, 4, and 6 exhaust valves and No. 3, 5, and 6 intake valves.

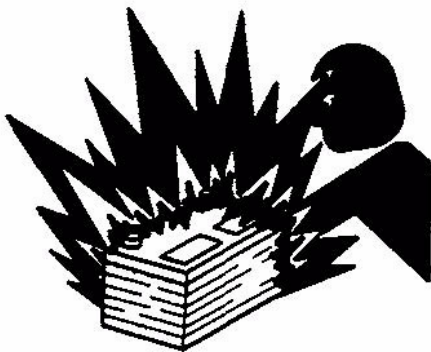
DRAIN AND FLUSH COOLING SYSTEM

NOTE: Drain and flush cooling system every 3000 hours/3 years when John Deere COOL-GARD coolant is used. Otherwise every 2000 hours/2 years.

WARNING

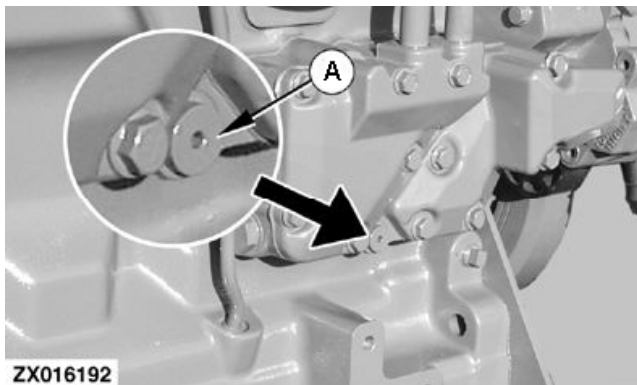
Explosive release of fluid from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap first to relieve pressure before removing completely.



1. Slowly open the radiator cap.

Figure 59: Oil Cooler Housing Drain Plug



A Oil Cooler Housing Drain Plug

Drain engine coolant according to following procedures:

2. Remove oil cooler housing drain plug (B).
3. Open radiator drain valve (C). Drain all coolant from radiator.
4. Close all drain orifices after coolant has drained.
5. Fill the cooling system with clean water. Run engine until water passes through the thermostat to stir up possible rust or sediment.

6. Stop engine and immediately drain the water from system before rust and sediment settle.
7. After draining water, close all drain orifices and fill the cooling system with cleaning product such as PMCC2610 or PMCC2638 Cooling System Cleaners available from your John Deere Dealer. Follow manufacturer's directions on label.
8. After cleaning the cooling system, drain cleaner and fill with water to flush the system. Run engine until water passes through the thermostat, then drain out flushing water.
9. Check cooling system hoses for proper condition. Replace as necessary.
10. Close all drain orifices and fill the cooling system with specified coolant (see Diesel Engine Coolant).

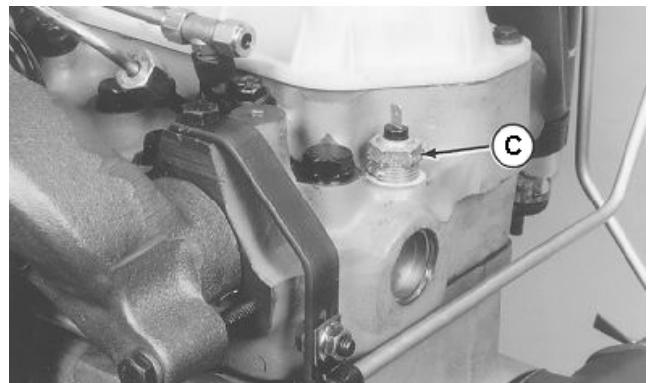
Figure 60: Radiator Drain Valve



C Radiator Drain Valve

11. When refilling cooling system, loosen temperature sensor (B) or plug at the rear of cylinder head to allow air to escape (except for 6090 engines).
12. Run engine until it reaches operating temperature then check coolant level and entire cooling system for leaks.

Figure 61: Coolant Temperature Sensor



C Coolant Temperature Sensor

WELDING NEAR ELECTRONIC CONTROL UNITS

⚠ CAUTION

Do not jump-start engines with arc welding equipment. Currents and voltages are too high and may cause permanent damage.

1. Disconnect the negative (-) battery cable(s).
2. Disconnect the positive (+) battery cable(s).
3. Connect the positive and negative cables together. Do not attach to vehicle frame.
4. Clear or move any wiring harness sections away from welding area.
5. Connect welder ground close to welding point and away from control units.
6. After welding, reverse Steps 1—5.

KEEP ELECTRONIC CONTROL UNIT CONNECTORS CLEAN

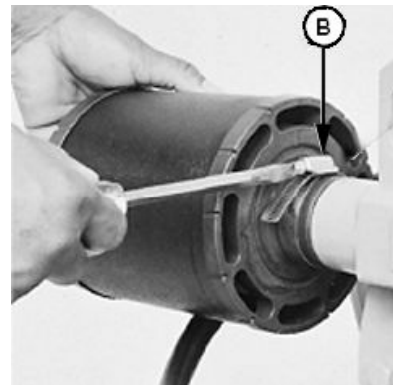
⚠ CAUTION

Do not open control unit and clean with a high-pressure spray. Moisture, dirt and other contaminants may cause permanent damage.

1. Keep terminals clean and free of foreign debris. Moisture, dirt and other contaminants may cause the terminals to erode over time and not make a good electrical connection.
2. If a connector is not in use, put on the proper dust cap or an appropriate seal to protect it from foreign debris and moisture.
3. Control units are not repairable.
4. Since control units are the components LEAST likely to fail, isolate failure before replacing by completing a diagnostic procedure. (See your John Deere dealer.)
5. The wiring harness terminals and connectors for electronic control units are repairable.

CLEAN OR REPLACE AIR FILTER (ONE-PIECE)

Figure 62



Clean air filter when restriction indicator (A) is red. Air filter can be cleaned up to six times. Thereafter, or at least once a year, it must be replaced.

Proceed as follows:

1. Thoroughly clean all dirt around air filter area.
2. Loosen clamp (B) then remove air filter.

⚠ CAUTION

Never reinstall an air filter which shows evidence of bad condition (punched, dented, etc.) allowing no filtered air to enter the engine.

3. Clean air filter with compressed air working from "clean" to "dirty" side.

NOTE: Compressed air pressure must not exceed 600 kPa (6 bar; 88 psi).

4. Mark air filter to keep track of each cleaning operation.
5. Fully depress air restriction indicator reset button and release to reset indicator.
6. Check air system entirely for proper condition (see Check Air Intake System).

CLEAN OR REPLACE AIR FILTER ELEMENT

Figure 63: Replace Air Filter Element
(6090 Engine Shown)



- A Air Filter Cover
B Air Filter Element

NOTE: The procedure for replacing air filter element can vary depending on air filter configuration.

Clean air filter element when restriction indicator is red. Air filter element can be cleaned up to six times. Thereafter, or at least once a year, it must be replaced.

Proceed as follows:

1. Thoroughly clean all dirt around air filter area.
2. Unlatch and remove air filter cover (A).
3. Remove air filter element (B) from canister.
4. Clean all dirt from inside canister.

CAUTION

Do not reinstall an air filter element which shows evidence of bad condition (punched, dented, etc.) allowing no filtered air to enter the engine.

5. Clean air filter element with compressed air working from "clean" to "dirty" side.

NOTE: Compressed air pressure must not exceed 600 kPa (6 bar; 88 psi).

6. Mark air filter to keep track of each cleaning operation.
7. Fully depress air restriction indicator reset button and release to reset indicator.
8. Check air system entirely for proper condition (see Check Air Intake System).

REPLACE FAN/ALTERNATOR POLY-V BELT

Figure 64: Fan/Alternator Belt Installation on 4045 Engine

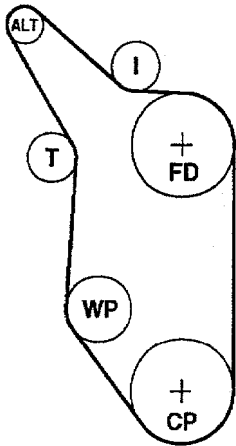
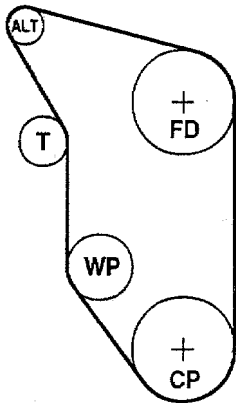


Figure 65: Fan/Alternator Belt Installation on 6068 Engine



ALT Alternator
CP Crank Pulley
FD Fan Drive
I Idler Pulley
T Tensioner
WP Water Pump

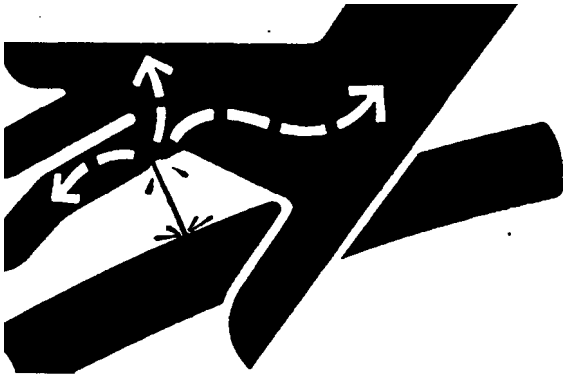
NOTE: With the belt removed, inspect pulleys and bearings. Rotate and feel for hard turning or any unusual sounds. If pulleys or bearings need replacement, see your John Deere Dealer or Distributor.

Refer to "Check Belt" to determine if belt needs to be replaced.

1. Inspect belts for cracks, fraying, or stretched out areas. Replace if necessary.

2. On engines with automatic belt tensioner, release tension on belt using a breaker bar and socket on tension arm.
On engines with manual tensioner, loosen cap screws holding the alternator.
3. Remove poly-V belt from pulleys and discard belt.
4. Install new belt, making sure belt is correctly seated in all pulley grooves. Refer to belt routing shown for your application.
5. Apply tension to belt (See Check Belt Section).
6. Start engine and check belt alignment.

BLEED THE FUEL SYSTEM



WARNING

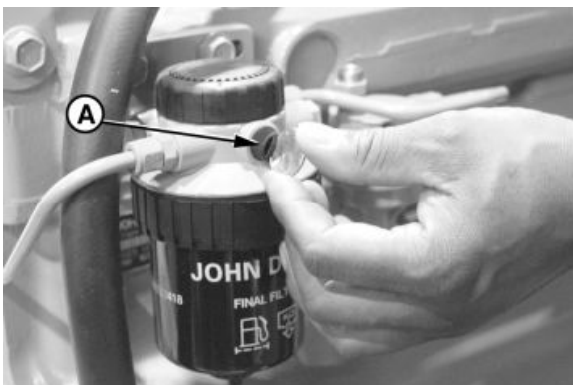
Escaping fluid under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting fuel or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluid under high pressure. Use a piece of cardboard or paper to search for leaks. Do not use your hand.

If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result. Doctors unfamiliar with this type of injury may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

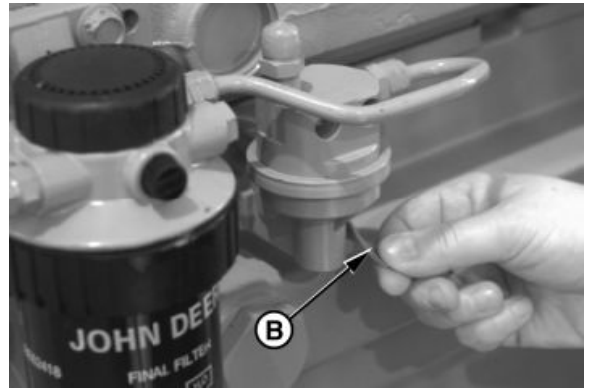
NOTE: 4045, and 6068 engines have two fuel filters (primary and final). Whenever the fuel system has been opened up for service (lines disconnected or filters removed), it will be necessary to bleed air from the system. On dual fuel filter system, bleed air only from final filter.

4045 Engines with Mechanical Fuel System

Figure 66: Fuel Filter Bleed Screw



A Air Bleed Screw



B Fuel Pump Primer Lever

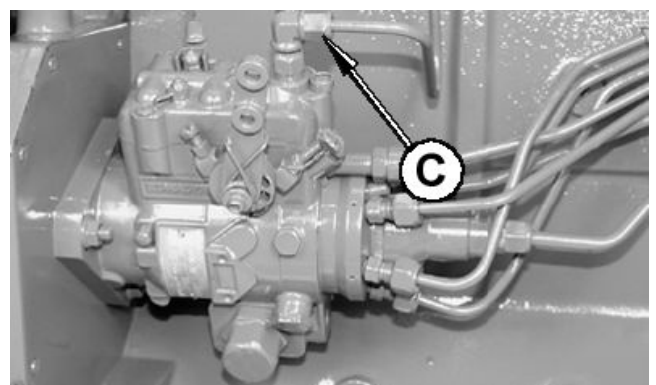
1. Loosen the air bleed screw (A) two full turns.
2. Operate fuel pump primer lever (B) until fuel flow is free from air bubbles.
3. Tighten bleed screw securely, continue operating hand nozzles as explained next. primer until pumping action is not felt.
4. Start engine and check for leaks.

If engine does not start, it will be necessary to bleed air from fuel system at fuel injection pump or injection

5. At Fuel Injection Pump:

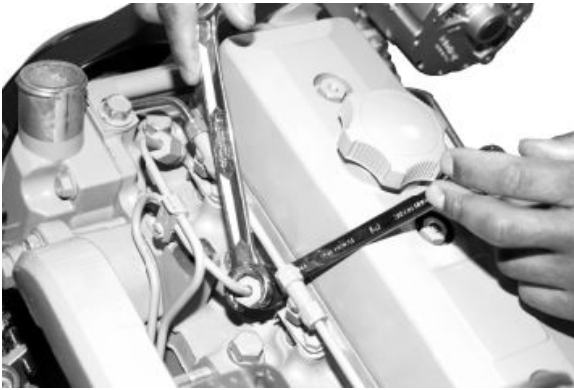
- a. Slightly loosen fuel return line connection (C) at fuel injection pump.
- b. Operate fuel pump primer lever until fuel, without air bubbles, flow from fuel return line connection.
- c. Securely tighten return line connection.

Figure 68: Mechanical Injection Pump Return Line



C Fuel Return Line Connection

Figure 69: Bleed Fuel System at Fuel Injection Nozzles



6. At Fuel Injection Nozzles:

- a. Using two open-end wrenches, loosen fuel line connection at injection nozzle.
- b. Crank engine over with starting motor (but do not start engine), until fuel free from bubbles flow out of loosened connection. Retighten connection to 27 N·m (20 lb.-ft.).
- c. Repeat procedure for remaining injection nozzles (if necessary) until all air has been removed from fuel system.

If engine still will not start, see your authorized servicing dealer or engine distributor. Bleed Fuel System at Fuel Injection Nozzles

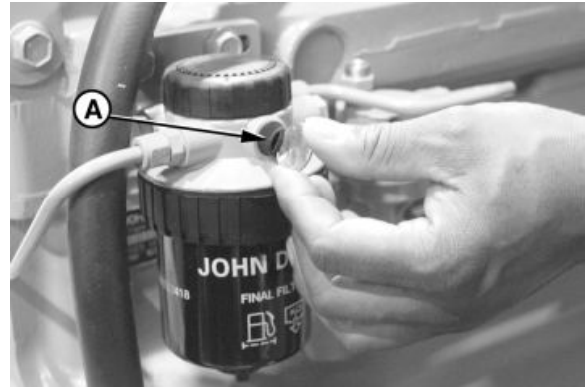
Engines with HPCR Fuel System



WARNING

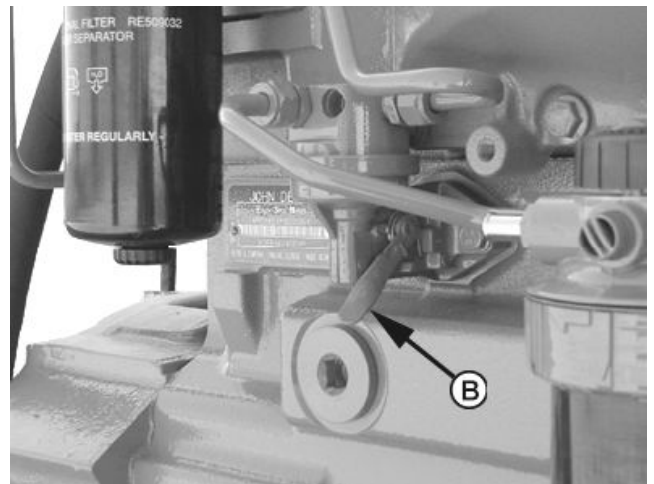
High-pressure fluid remaining in fuel lines can cause serious injury. Do not disconnect fuel lines between the high pressure fuel pump and nozzles. Only bleed the fuel system at the fuel filter bleed screw (A).

Figure 70: Final Fuel Filter Bleed Screw



A Air Bleed Screw

Figure 71: Fuel Pump Primer Lever



B Fuel Pump Primer Lever

1. Loosen the air bleed screw (A) two full turns on final filter base only.
2. Operate fuel supply pump primer lever (B) until fuel flow is free from air bubbles.
3. Tighten bleed screw securely. Continue operating primer until pumping action is not felt.
4. Start engine and check for leaks.

If engine will not start, repeat steps 1-4.

Troubleshooting

ENGINE TROUBLESHOOTING

NOTE: Before troubleshooting the engine, first retrieve any diagnostic trouble codes on the diagnostic gauge display and perform the corrective actions. If any problems remain, use the following charts to solve engine problems.

SYMPTOM	PROBLEM	SOLUTION
Engine cranks but will not start	Incorrect starting procedure.	Verify correct starting procedure.
	No fuel.	Check fuel in tank and manual shut-off valve.
	Exhaust restricted.	Check and correct exhaust restriction.
	Fuel filter plugged or full of water.	Replace fuel filter or drain water from filter.
	Injection pump not getting fuel or air in fuel system.	Check fuel flow at supply pump or bleed fuel system.
	Faulty injection pump or nozzles.	Consult authorized diesel repair station for repair or replacement.
Engine hard to start or will not start	Engine starting under load.	Remove load.
	Improper starting procedure.	Review starting procedure.
	No fuel.	Check fuel tank.
	Air in fuel line.	Bleed fuel line.
	Cold weather.	Use cold weather starting aids.
	Slow starter speed.	See "Starter Cranks Slowly".
	Crankcase oil too heavy.	Use oil of proper viscosity.
	Improper type of fuel.	Consult fuel supplier; use proper type fuel for operating conditions.
	Water, dirt, or air in fuel system.	Drain, flush fill and bleed system.
	Clogged fuel filter.	Replace filter element.
	Dirty or faulty injection nozzles.	Have authorized servicing dealer or engine distributor check injectors.
	Injection pump shut-off not reset.	Turn key switch to "OFF" then to "ON".
Engine knocks	Low engine oil level.	Add oil to engine crankcase.
	Injection pump out of time.	See your authorized servicing dealer or engine distributor.
	Low coolant temperature.	Remove and check thermostat.
	Engine overheating.	See "Engine Overheats".
Engine runs irregularly or stalls frequently	Low coolant temperature.	Remove and check thermostat.
	Clogged fuel filter.	Replace fuel filter element.
	Water, dirt, or air in fuel system.	Drain, flush fill and bleed system.
	Dirty or faulty injection nozzles.	Have authorized servicing dealer or engine distributor check injectors.
Below normal engine temperature	Defective thermostat.	Remove and check thermostat.
	Defective temperature gauge or sender.	Check gauge, sender, and connections.

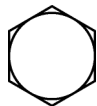
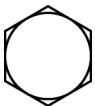
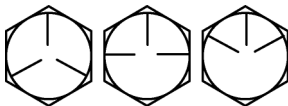
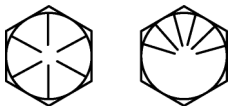
Lack of power	Engine overloaded.	Reduce load.
	Intake air restriction.	Service air cleaner.
	Clogged fuel filter.	Replace filter elements.
	Improper type of fuel.	Use proper fuel.
	Overheated engine.	See "Engine Overheats".
	Below normal engine temperature.	Remove and check thermostat.
	Improper valve clearance.	See your authorized servicing dealer or engine distributor.
	Dirty or faulty injection nozzles.	Have authorized servicing dealer or engine distributor check injectors.
	Injection pump out of time.	See your authorized servicing dealer or engine distributor.
	Turbocharger not functioning.	See your authorized servicing dealer or engine distributor.
	Leaking exhaust manifold gasket.	See your authorized servicing dealer or engine distributor.
	Defective aneroid control line.	See your authorized servicing dealer or engine distributor.
	Restricted fuel hose.	Clean or replace fuel hose.
	Low fast idle speed.	See your authorized servicing dealer or engine distributor.
	Low oil level.	Add oil.
	Improper type of oil.	Drain, fill crankcase with oil of proper viscosity and quality.
High oil consumption	Crankcase oil too light.	Use proper viscosity oil.
	Oil leaks.	Check for leaks in lines, gaskets, and drain plug.
	Restricted crankcase vent tube.	Clean vent tube.
	Defective turbocharger.	See your authorized servicing dealer or engine distributor.
Engine emits white smoke	Improper type of fuel.	Use proper fuel.
	Low engine temperature.	Warm up engine to normal operating temperature.
	Defective thermostat.	Remove and check thermostat.
	Defective injection nozzles.	See your authorized servicing dealer or engine distributor.
	Engine out of time.	See your authorized servicing dealer or engine distributor.
Engine emits black or gray exhaust smoke	Improper type of fuel.	Use proper fuel.
	Clogged or dirty air cleaner.	Service air cleaner.
	Engine overloaded.	Reduce load.
	Injection nozzles dirty.	See your authorized servicing dealer or engine distributor.
	Engine out of time.	See your authorized servicing dealer or engine distributor.
	Turbocharger not functioning.	See your authorized servicing dealer or engine distributor.

Engine overheats	Engine overloaded.	Reduce load.
	Low coolant level.	Fill radiator to proper level, check radiator and hoses for loose connections or leaks.
	Faulty radiator cap.	Have serviceman check.
	Stretched poly V-belt or defective belt tensioner.	Check automatic belt tensioner and check belts for stretching. Replace as required.
	Low engine oil level.	Check oil level. Add oil as required.
	Cooling system needs flushing	Flush cooling system.
	Defective thermostat.	Remove and check thermostat.
	Defective temperature gauge or sender.	Check water temperature with thermometer and replace, if necessary.
	Incorrect grade of fuel.	Use correct grade of fuel.
High fuel consumption	Incorrect grade of fuel.	Use correct grade of fuel.
	Clogged or dirty air cleaner.	Service air cleaner.
	Engine overloaded.	Reduce load.
	Improper valve clearance.	See your authorized servicing dealer or engine distributor.
	Injection nozzles dirty.	See your authorized servicing dealer or engine distributor.
	Engine out of time.	See your authorized servicing dealer or engine distributor.
	Defective turbocharger.	See your authorized servicing dealer or engine distributor.
	Low engine temperature.	Check thermostat.
Undercharged system	Excessive electrical load from added accessories.	Remove accessories or install higher output alternator.
	Excessive engine idling.	Increase engine rpm when heavy electrical load is used.
	Poor electrical connections on battery, ground strap, starter, or alternator.	Inspect and clean as necessary.
	Defective battery.	Test battery.
	Defective alternator.	Test charging system.
Battery uses too much water	Cracked battery case.	Check for moisture and replace as necessary.
	Defective battery.	Test battery.
	Battery charging rate too high.	Test charging system.
Batteries will not charge	Loose or corroded connections.	Clean and tighten connections.
	Sulfated or worn-out batteries.	See your authorized servicing dealer or engine distributor.
	Stretched poly V-belt or defective belt tensioner.	Adjust belt tension or replace belts.
Starter will not crank	Engine under load.	Remove load.
	Loose or corroded connections.	Clean and tighten connections.
	Low battery output voltage.	See your authorized servicing dealer or engine distributor.
	Faulty start circuit relay.	See your authorized servicing dealer or engine distributor.
	Blown fuse.	Replace fuse.

Starter cranks slowly	Low battery output.	See your authorized servicing dealer or engine distributor.
	Crankcase oil too heavy.	Use proper viscosity oil.
	Loose or corroded connections.	Clean and tighten connections.
Entire electrical system	Faulty battery connection.	Clean and tighten connections.
	Sulfated or worn-out batteries.	See your authorized servicing dealer or engine distributor.
	Blown fuse.	Replace fuse.

SPECIFICATIONS

Unifie Inch Bolt and Screw Torque Values

																
Bolt or Screw Size	SAE Grade 1				SAE Grade 2 ^a				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c		Lubricated ^b		Dry ^c	
	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N·m	lb.-ft.	N·m	lb.-ft.
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N·m	lb.-ft.	N·m	lb.-ft.				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N·m	lb.-ft.														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350
Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.									Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.							

^a Grade 2 applies for hex cap screws (not hex bolts) up to 6 in. (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

^b "Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

^c "Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B, F13E or F13H zinc flake coating.

SPECIFICATIONS (CONT'D)

Metric Bolt and Screw Torque Values

	 				 								 			
Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b		Lubricated ^a		Dry ^b	
	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
M6	4.7	42	6	53	8.9	79	11.3	100	13	115	16.5	146	15.5	137	19.5	172
									N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.
M8	11.5	102	14.5	128	22	194	27.5	243	32	23.5	40	29.5	37	27.5	47	35
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
M10	23	204	29	21	43	32	55	40	63	46	80	59	75	55	95	70
	N·m	lb.-ft.														
M12	40	29.5	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	46	80	59	120	88	150	110	175	130	220	165	205	150	260	190
M16	100	74	125	92	190	140	240	175	275	200	350	255	320	235	400	300
M18	135	100	170	125	265	195	330	245	375	275	475	350	440	325	560	410
M20	190	140	245	180	375	275	475	350	530	390	675	500	625	460	790	580
M22	265	195	330	245	510	375	650	480	725	535	920	680	850	625	1080	800
M24	330	245	425	315	650	480	820	600	920	680	1150	850	1080	800	1350	1000
M27	490	360	625	460	950	700	1200	885	1350	1000	1700	1250	1580	1160	2000	1475
M30	660	490	850	625	1290	950	1630	1200	1850	1350	2300	1700	2140	1580	2700	2000
M33	900	665	1150	850	1750	1300	2200	1625	2500	1850	3150	2325	2900	2150	3700	2730
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2770	4750	3500
Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For stainless steel fasteners or for nuts on U-bolts, see the tightening instructions for the specific application. Tighten plastic insert or crimped steel type lock nuts by turning the nut to the dry torque shown in the chart, unless different instructions are given for the specific application.								Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical property class. Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.								

^a "Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or M20 and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

^b "Dry" means plain or zinc plated without any lubrication, or M6 to M18 fasteners with JDM F13B, F13E or F13H zinc flake coating.

ALTERNATOR INSTALLATION AND MAINTENANCE

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ELECTRICAL FAULTS 80

 Checking the winding

 Checking the diode bridge

 Checking the windings and rotating diodes using separate excitation

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FOREWORD

This section concerns the alternator which you have just purchased.

We wish to draw your attention to the contents of this maintenance chapter.

SAFETY MEASURES

Before using your machine for the first time, it is important to read the whole of this installation and maintenance manual.

All necessary operations and interventions on this machine must be performed by a qualified technician.

Our technical support service will be pleased to provide any additional information you may require.

The various operations described in this manual are accompanied by recommendations or symbols to alert the user to the potential risk of accidents. It is vital that you understand and take notice of the different warning symbols used.

A set of self-adhesive decals depicting the various warning symbols is included with this maintenance manual. They should be positioned as shown in the drawing below once the machine has been fully installed.



The alternators must not be put into service until the machines in which they are to be incorporated have been declared compliant with Directives EC and plus any other directives that may be applicable.



Warning symbol for an operation capable of damaging or destroying the machine or surrounding equipment.



Warning symbol for general danger to personnel.



Warning symbol for electrical danger to personnel.

WARNING SYMBOLS

We wish to draw your attention to the following 2 safety measures which must be complied with:

- a) During operation, do not allow anyone to stand in front of the air outlet guards, in case anything is ejected from them.
- b) Do not allow children younger than 14 to go near the air outlet guards.

RECEIPT

STANDARDS AND SAFETY MEASURES

Our alternators comply with most international standards. See the EC Declaration of Incorporation on the last page.

INSPECTION

On receipt of your alternator, check that it has not suffered any damage in transit. If there are obvious signs of knocks, contact the transporter (you may be able to claim on their insurance) and after a visual check, turn the machine by hand to detect any malfunction.

IDENTIFICATION

The alternator is identified by means of a nameplate fixed on the machine (see drawing). Make sure that the nameplate on the machine conforms to your order. The machine name is defined according to various criteria, for example: LSA 46.2 M5 C6/4

- LSA: name used in the PARTNER range
- M: Marine
- C: Cogeneration
- T: Telecommunications
- 46.2: machine type
- M5: model
- C: excitation system
(C: AREP / J: SHUNT or PMG)
- 6/4: winding number / number of poles.

Nameplate

So that you can identify your machine quickly and accurately, we suggest you write its specifications on the nameplate below.

STORAGE

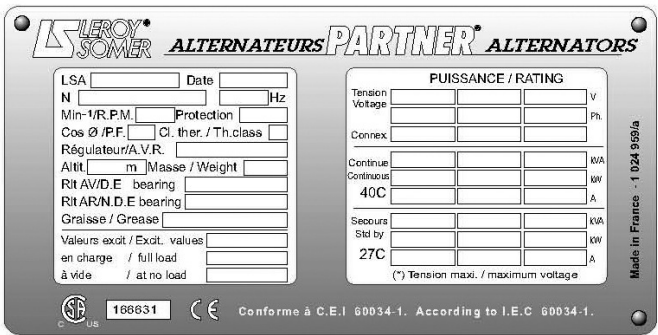
- Prior to commissioning, machines should be stored:
- Away from humidity (< 90%); after a long period of storage, check the machine insulation (See “Electrical checks” on page 73) To prevent the bearings from becoming marked, do not store in an environment with significant vibration.

APPLICATION

These alternators are mainly designed to produce electricity in the context of applications involving the use of generators.

CONTRAINDICATIONS TO USE

Use of the machine is restricted to operating conditions (environment, speed, voltage, power, etc.) compatible with the characteristics indicated on the nameplate.



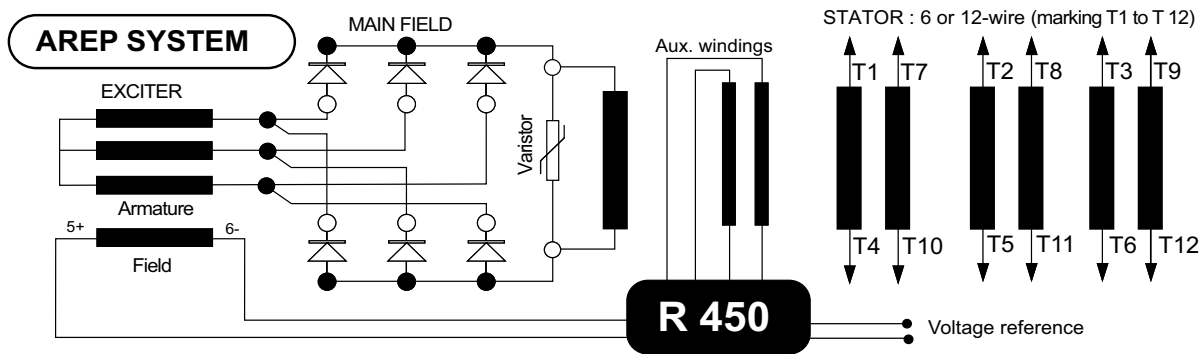
TECHNICAL CHARACTERISTICS

ELECTRICAL CHARACTERISTICS

This LSA 46.2 alternator is a machine without slip rings or revolving armature brushes, wound as “2/3 pitch”, 12 wire, with class H insulation and an AREP field excitation system.

MECHANICAL OPTIONS

- Steel frame
- Cast iron end shields
- Protected ball bearings, greased for life
- Mounting arrangements: IM 1201 (MD 35) foot and flange mounted, single-bearing with SAE coupling disc.
- Drip-proof machine, self-cooled
- Degree of protection: IP 23



INSTALLATION

Personnel undertaking the various operations indicated in this section must wear personal protective equipment appropriate for mechanical and electrical hazards.

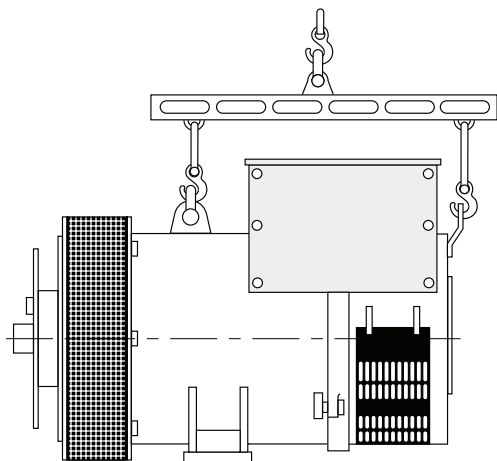
ASSEMBLY

! WARNING

All mechanical handling operations must be undertaken using suitable equipment and the machine must be horizontal. Check how much the machine weighs before choosing the lifting tool.

Handling

The generously sized lifting rings are for handling the alternator alone. They must not be used to lift the genset. The choice of lifting hooks or handles should be determined by the shape of these rings. Choose a lifting system which respects the integrity and the environment of the alternators.



During this operation, do not allow anyone to stand under the load.

Coupling

Single-bearing alternator

Before coupling the machines, check that they are compatible by:

- undertaking a torsional analysis of the transmission,
- checking the dimensions of the flywheel and its housing, the flange, coupling discs and offset.

! CAUTION

When coupling the alternator to the prime mover, do not use the fan to turn the alternator or rotor. The holes of the coupling discs should be aligned with the flywheel holes by cranking the engine. Make sure the alternator is securely bedded in position during coupling.

Check that there is lateral play on the crankshaft.

Double-bearing alternator

Semi-flexible coupling Careful alignment of the machines is recommended, checking that the lack of concentricity and parallelism of both parts of the coupling do not exceed 0.1 mm.

This alternator has been balanced with a 1/2 key.

Location

The room where the alternator is placed must be ventilated to ensure that the ambient temperature cannot exceed the data on the nameplate.

CHECKS PRIOR TO FIRST USE

Electrical checks

! WARNING

Under no circumstances should an alternator, new or otherwise, be operated if the insulation is less than 1 meg ohm for the stator and 100,000 ohms for the other windings.

There are 2 possible methods for restoring the above minimum values.

a) Dry out the machine for 24 hours in a drying oven at a temperature of 110 °C (without the regulator).

b) Blow hot air into the air intake, having made sure that the machine is rotating with the exciter field disconnected.

Note: Prolonged standstill: In order to avoid these problems, we recommend the use of space heaters, as well as turning over the machine from time to time. Space heaters are only really effective if they are working continuously while the machine is stopped.

! WARNING

Ensure that the alternator has the degree of protection matching the defined environmental conditions.

Mechanical checks

Before starting the machine for the first time, check that:

- all fixing bolts and screws are tight.
- the cooling air is drawn in freely.
- the protective grilles and housing are correctly in place.
- the standard direction of rotation is clockwise as seen from the shaft end (phase rotation in order 1 - 2 - 3). For anti-clockwise rotation, swap 2 and 3.

- the winding connection corresponds to the site operating voltage (See "TERMINAL CONNECTION DIAGRAMS" on page 74).

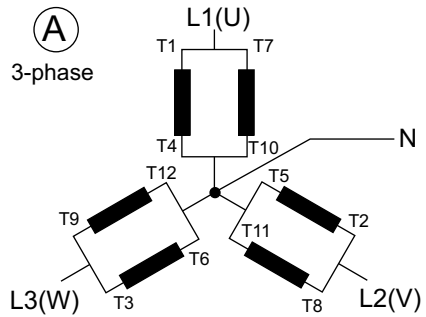
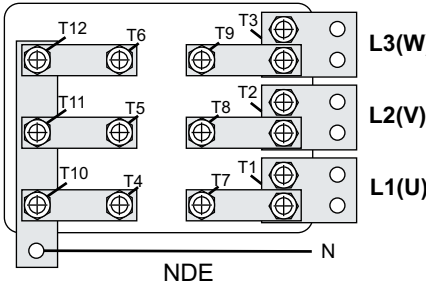
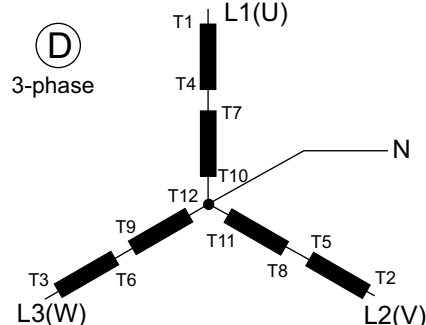
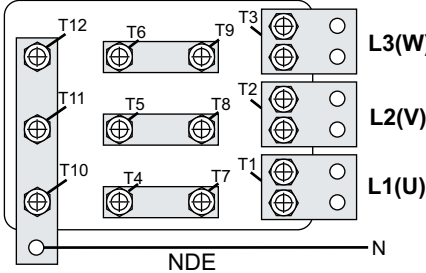
TERMINAL CONNECTION DIAGRAMS

To modify the connection, change the position of the stator cables on the terminals. The winding code is specified on the nameplate.

Terminal connection: 12 wire

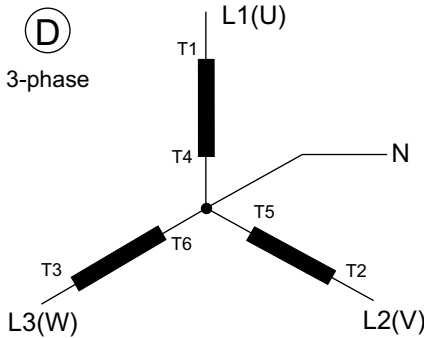
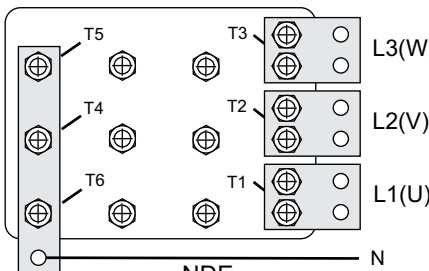
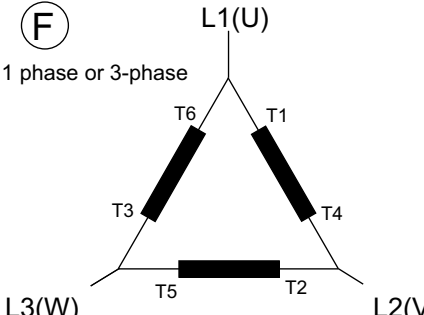
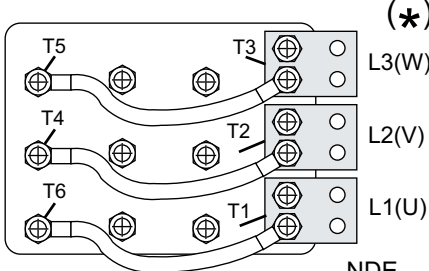
! WARNING

Any intervention on the alternator terminals during connection or checks should be performed with the machine stopped.

Connection codes		Voltage L.L			Factory connection	
A 3-phase 	Winding	50 Hz	60 Hz			
	6	190 - 208	190 - 240			
	7	220	-			
	8	-	190 - 208			
	 R 250 voltage detection : 0 => (T8) / 110 V => (T11) R 450 voltage detection : 0 => (T3) / 220 V => (T2)					
D 3-phase 	Winding	50 Hz	60 Hz			
	6	380 - 415	380 - 480			
	7	440	-			
	8	-	380 - 416			
	 R 250 voltage detection : 0 => (T8) / 110 V => (T11) R 450 voltage detection : 0 => (T3) / 380 V => (T2)					
9	500	600				
Winding 9 : R 450 voltage detection + transformer (See specific diagram AREP or SHUNT)						
 In case of connection, ensure that AVR voltage detection is correct ! The factory can supply a set of flexible shunts and special connection links as an option for making these connections. (*).						

Connection codes	Voltage L.L			Factory connection
FF 1 phase				

Terminal connection: 6 wire (not possible with the R 250)

Connection codes	Voltage L.L			Factory connection
D 3-phase 	Winding	50 Hz	60 Hz	 Winding 9 : R 450 voltage detection + transformer (See specific diagram)
	6S	380 - 415	380 - 480	
	7S	440	-	
	8S	-	380 - 416	
	9S	-	600	
R 450 voltage detection : 0 => (T3) / 380 V => (T2)				
F 1 phase or 3-phase 	Winding	50 Hz	60 Hz	(*)  Operating phases : L2 (V), L3 (W) single phase
	6S	220 - 240	220 - 277	
	7S	240 - 254	-	
	8S	-	220 - 240	
R 450 voltage detection : 0 => (T3) / 220 V => (T2)				
In case of connection, ensure that the AVR voltage detection is correct ! The factory can supply a set of flexible shunts and special connection links as an option for making these connections. (*).				

Connection checks

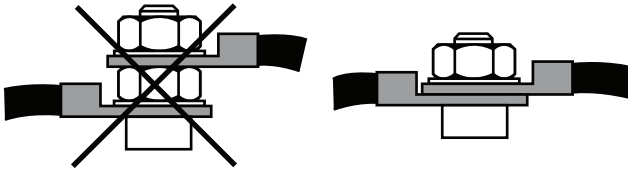


Electrical installations must comply with the current legislation in force in the country of use.

Check that:

- The residual circuit-breaker conforms to legislation on protection of personnel, in force in the country of use, and has been correctly installed on the alternator power output as close as possible to the alternator. (In this case, disconnect the wire of the interference suppression module linking the neutral).
- Any protection devices in place have not been tripped.
- If there is an external AVR, the connections between the alternator and the cabinet are made in accordance with the connection diagram.
- There is no short-circuit phase-phase or phase-neutral between the alternator output terminals and the generator set control cabinet (part of the circuit not protected by circuit breakers or relays in the cabinet).

- The machine should be connected with the busbar separating the terminals as shown in the terminal connection diagram.



COMMISSIONING



The machine can only be started up and used if the installation is in accordance with the regulations and instructions defined in this manual.

The machine is tested and set up at the factory. When first used with no load, make sure that the drive speed is correct and stable (see the nameplate). With the regreasable bearing option, we recommend greasing the bearings at the time of commissioning (See "Bearings" on page 77). On application of the load, the machine should achieve its rated speed and voltage; however, in the event of abnormal operation, the machine setting can be altered (follow the adjustment procedure (See "SETTING UP" on page 77). If the machine still operates incorrectly, the cause of the malfunction must be located (See "MECHANICAL DEFECTS" on page 79).

SETTING UP



The various adjustments during tests must be made by a qualified engineer. Ensure that the drive speed specified on the nameplate is reached before commencing adjustment. After operational testing, replace all access panels or covers. The AVR is used to make any adjustments to the machine.

SERVICING - MAINTENANCE

SAFETY MEASURES

Servicing or troubleshooting must be carried out strictly in accordance with instructions so as to avoid the risk of accidents and to maintain the machine in its original state.



All such operations performed on the alternator should be undertaken by personnel trained in the commissioning, servicing and maintenance of electrical and mechanical components, who must wear personal protective equipment appropriate for mechanical and electrical hazards.

Before any intervention on the machine, ensure that it cannot be started by a manual or automatic system and that you have understood the operating principles of the system.

ROUTINE MAINTENANCE

Checks after start-up

After approximately 20 hours of operation, check that all fixing screws on the machine are still tight, plus the general state of the machine and the various electrical connections in the installation.

Bearings

As standard, the alternator is fitted with permanently greased bearings. As an option, they may be regreasable. It is advisable to lubricate the alternator during operation. Time intervals and quantity of grease are given in the table below.

DE / NDE BEARING	6316 C3	6315 C3
Quantity of grease	33g	30g
Regreasing interval	4000H	4500H

Lubrication intervals are given for grease type: LITHIUM - standard - NLGI 3.

In the factory, the grease used for lubrication is: ESSO - Unirex N3.

Before using another grease, check for compatibility with the original one. Monitor the temperature rise in the bearings (See "MECHANICAL DEFECTS" on page 79).

Electrical servicing

Commercially-available volatile degreasing agents can be used.



Do not use: trichlorethylene, perchlorethylene, trichloroethane or any alkaline products.



These operations must be performed at a cleaning station, equipped with a vacuum system that collects and flushes out the products used.

The insulating components and the impregnation system are not at risk of damage from solvents. Avoid letting the cleaning product run into the slots. Apply the product with a brush, sponging frequently to avoid accumulation in the housing. Dry the winding with a dry cloth. Let any traces evaporate before reassembling the machine.



CAUTION

Cleaning the machine using water or a high pressure washer is strictly prohibited. Any problems arising from such treatment are not covered by our warranty.

Degreasing: Use a brush and detergent (suitable for paint work). Dusting: Use an air gun. If the machine is fitted with air inlet and outlet filters, the maintenance personnel should clean them routinely at regular intervals. In the case of dry dust, the filter can be cleaned using compressed air and / or replaced if it is clogged. After cleaning the alternator, it is essential to check the winding insulation (See "CHECKS PRIOR TO FIRST USE" on page 73).

FAULT DETECTION

If, when commissioned, the alternator does not work normally, the source of the malfunction must be identified (See "MECHANICAL DEFECTS" on page 79) (See "ELECTRICAL FAULTS" on page 80).

MECHANICAL DEFECTS

	FAULT	ACTION
Bearing	Excessive temperature rise in one or both bearings (bearing temperature more than 80 °C) with or without abnormal bearing noise	- If the bearing has turned blue or if the grease has turned black, change the bearing
		- Bearing not fully locked (abnormal play in the bearing cage)
		- Check the end shield alignment (flange not properly fitted)
Abnormal temperature	Excessive temperature rise in the alternator housing (more than 40° C above the ambient temperature)	- Air flow (intake-outlet) partially clogged or hot air is being recycled from the alternator or engine
		- Alternator operating at too high a voltage (> 105% of Un on load)
		- Alternator overloaded
Vibration	Excessive vibration	- Misalignment (coupling)
		- Defective mounting or play in coupling
		- Rotor balancing fault (Engine - Alternator)
	Excessive vibration and humming noise coming from the machine	- Phase imbalance
		- Stator short-circuit
Abnormal noise	Alternator damaged by a significant impact, followed by humming and vibration	- System short-circuit
		- Mis-paralleling
		Possible consequences:
		- Broken or damaged coupling
		- Broken or bent shaft extension
		- Shifting and short-circuit of revolving field winding
		- Fan fractured or coming loose on shaft
		- Irreparable damage to rotating diodes, AVR, surge suppressor

ELECTRICAL FAULTS

FAULT	ACTION	EFFECT	CHECK / CAUSE
No voltage at no load on start-up	Connect a new battery of 4 to 12 volts to terminals E- and E+, respecting the polarity, for 2 to 3 seconds	The alternator builds up and its voltage is still correct when the battery is removed	- Lack of residual magnetism
		The alternator builds up but its voltage does not reach the rated value when the battery is removed	- Check the connection of the voltage reference to the AVR
			- Faulty diodes
			- Armature short-circuit
		The alternator builds up but its voltage disappears when the battery is removed	- Faulty AVR
			- Field windings open circuit (check winding)
	- Revolving field coil open circuit (check the resistance)		
Voltage too low	Check the drive speed	Correct speed	Check the AVR connections (AVR may be faulty)
			- Field windings short-circuited
			- Rotating diodes burnt out
			- Revolving field coil short-circuited
			- Check the resistance
		Speed too low	Increase the drive speed (do not touch the AVR voltage pot. (P2) before running at the correct speed)
Voltage too high	Adjust AVR voltage potentiometer	Adjustment ineffective	Faulty AVR
Voltage oscillations	Adjust the AVR stability potentiometer	If no effect: try normal or fast stability modes (ST2)	- Check the speed: possibility of cyclic irregularity
			- Loose connections
			- Faulty AVR- Speed too low when on load (or AVR LAM set too high)
Voltage correct at no load and too low when on load	Run at no load and check the voltage between E+ and E- on the AVR	Voltage between E+ and E- (DC) SHUNT / AREP / PMG < 10V	- Check the speed (or AVR LAM set too high)
		Voltage between E+ and E- SHUNT / AREP / PMG > 15V	- Faulty rotating diodes
			- Short-circuit in the revolving field coil. Check the resistance.
			- Faulty exciter armature. Check the resistance.
Voltage disappears during operation	Check the AVR, the surge suppressor, the rotating diodes, and replace any defective components	The voltage does not return to the rated value	- Exciter winding open circuit
			- Faulty exciter armature
			- Faulty AVR
			- Revolving field coil open circuit or short-circuited

Checking the winding

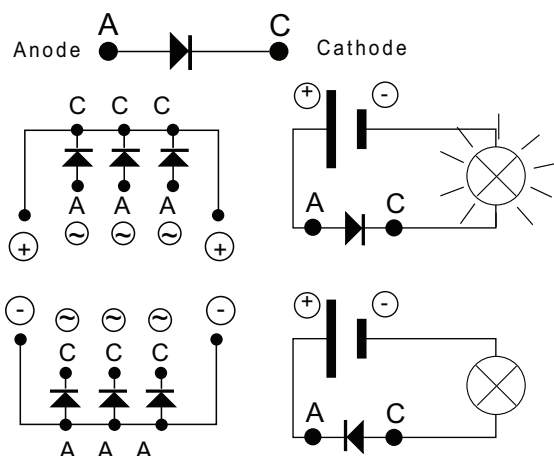
You can check the winding insulation by performing a high voltage test. In this case, you must disconnect all AVR wires.



Damage caused to the AVR in such conditions is not covered by our warranty.

Checking the diode bridge

A diode in good working order should allow the current to flow only in the anode-to-cathode direction.



Checking the windings and rotating diodes using separate excitation

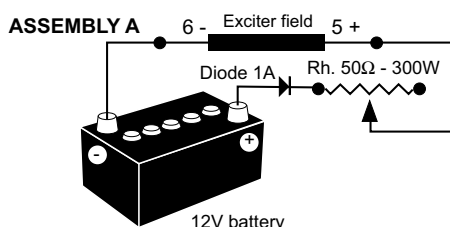


During this procedure, make sure that the alternator is disconnected from any external load and inspect the terminal box to check that the connections are fully tightened.

1. Stop the unit, disconnect and isolate the AVR wires.
2. There are two ways of creating an assembly with separate excitation.

Assembly A: Connect a 12 V battery in series with a rheostat of approximately 50 ohms - 300 W and a diode on both exciter field wires (5+) and (6-).

Assembly A

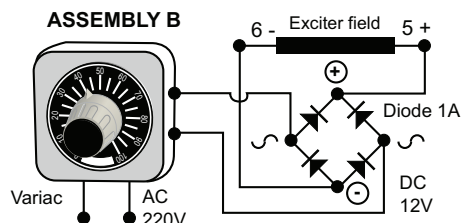


Assembly B: Connect a "Variac" variable power supply and a diode bridge on both exciter field wires (5+) and (6-).

Both these systems should have characteristics which are compatible with the field excitation power of the machine (see the nameplate).

3. Run the unit at its rated speed.
4. Gradually increase the exciter field current by adjusting the rheostat or the variac and measure the output voltages on L1 - L2 - L3, checking the excitation voltage and current at no load (see the machine nameplate or ask for the factory test report). When the output voltage is at its rated value and balanced within 1% for the rated excitation level, the machine is in good working order. The fault therefore comes from the AVR or its associated wiring (i.e. sensing, auxiliary windings).

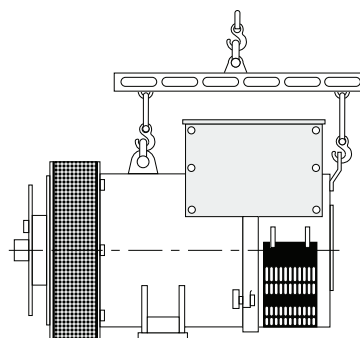
Assembly B



DISMANTLING, REASSEMBLY (SEE PAGE 86).



During the warranty period, this operation should only be carried out in an LEROY-SOMER approved workshop or in our factory, otherwise the warranty may be invalidated. Whilst being handled, the machine should remain horizontal (rotor not locked in position). Check how much the machine weighs before choosing the lifting method.



Tools required

To fully dismantle the machine, we recommend using the tools listed below:

- 1 ratchet spanner + extension
- 1 torque wrench

- 1 set of flat spanners: 8 mm, 10 mm, 18 mm -1 socket set: 8, 10, 13, 16, 18, 21, 24, 30 mm
- 1 socket with male ferrule: 5 mm
- 1 puller

Screw tightening torque

See page 86

Access to diodes

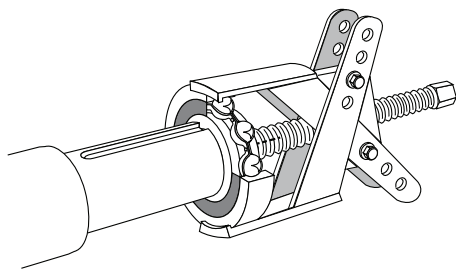
- Open the air intake grille (51).
- Disconnect the diodes.
- Check the 6 diodes, change the diode bridges if necessary.

Access to connections and the regulation system

Access directly by removing the top of the cover (48) or the AVR access door (466).

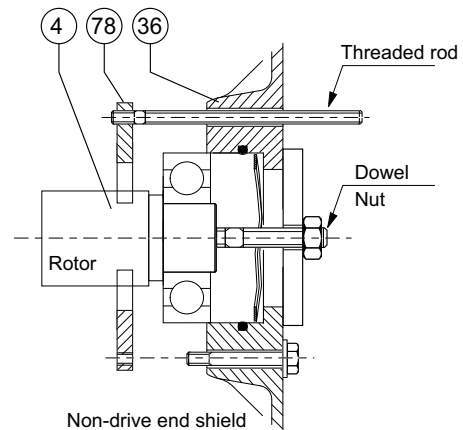
Replacing the non-drive end bearing

- Remove the box lid (48) and the non-drive end panel (365) and remove the 2 screws from the part (122).
- Disconnect the stator outputs (T1 to T12).
- Disconnect the auxiliary winding wires AREP (X1,X2,Z1,Z2).
- Disconnect the exciter wires (5+,6-).
- Remove the air inlet louvre (51). If using a single-bearing or double-bearing machine with the regreasable bearing option: -Remove the bearing (78) thrust screws (72).
- Remove all 4 screws (37).
- Remove the shield (36).
- Take out the anti friction bearing (70) using a puller with a central screw (see drawing below).



- Fit the new anti friction bearing onto the shaft after heating it by induction to approximately 80 °C.

- Mount the new pre loading (wavy) washer (79) + the new "O" ring seal (349) in the shield (36) and coat the bearing seat with adhesive paste (see After Sales Service).If using a single-bearing or double-bearing machine with the regreasable bearing option:
- Screw a threaded rod into the thrust bearing (78).
- Refit the end shield on the machine using a dowel and nut in the shaft extension (see drawing).
- Slide the threaded rod into the shield hole to make it easier to assemble (see basic diagram).



- Fit the thrust bearing screws (78), remove the threaded rod, fit the other screw and tighten up the assembly.
- Tighten the 4 bearing screws (37).
- Connect wires.
- Fit the 2 support screws (122).
- Fit the air inlet louvre (51).
- Replace the cover.

CAUTION

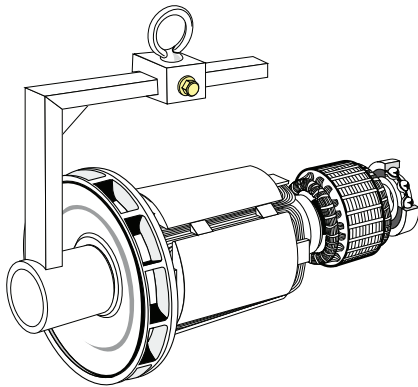
When dismantling the shields, you will need to change the anti friction bearings, the "O" ring seal, the pre loading (wavy) washer and adhesive paste.

Dismantling the rotor assembly

- Remove the non-drive end shield (36) (See "Replacing the non-drive end bearing" on page 82).
- Remove the drive end shield (30) if it is a double-bearing machine.
- Support the drive end rotor (4) with a strap or with a support constructed in accordance with the following drawing.
- Move the strap as the rotor moves in order to distribute the weight over it.

! CAUTION

When dismantling the rotor involves changing parts or rewinding, the rotor must be rebalanced.



Reassembling the machine

- Mount the rotor (4) in the stator (1) (see drawing above) taking care not to knock the windings.

If using a single-bearing or double-bearing machine with the regreasable bearing option:

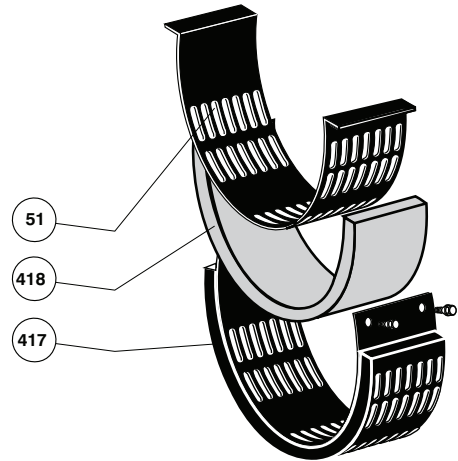
- Mount the new pre loading (wavy) washer (79) + the new "O" ring seal (349) in the shield (36).
- Screw a threaded rod into the thrust bearing (78).
- Refit the shield (36) on the machine using a dowel and nut in the shaft extension (see diagram).
- Slide the threaded rod into the shield hole to make it easier to assemble (see diagram).
- Fit the thrust bearing screws (78), remove the threaded rod, fit the other screw and tighten up the assembly.
- Tighten the 4 bearing screws (37).

- Reconnect exciter wires E+, E-.
- Finish reassembling the cover.
- Refit the flange (30) on the stator (1).
- Tighten the screws (31).

Dismantling and reassembly of the filters

- Remove the grille (417) then take out the filter (418). Change the filter if necessary; please refer to section 4.2.5 for cleaning the filter.

To replace, follow the instructions in reverse order.



⚡ WARNING

After operational testing, it is essential to replace all access panels or covers.

TABLE OF CHARACTERISTICS

G60-SIIIA

Three-phase: 4-pole, AREP excitation

Resistances at 20 °C (Ω)

42.3	Stator L/N	Rotor	Field coil	Armature
L9	0.095	0.91	7.35	0.20

Resistance of auxiliary windings at 20 °C (Ω)

Type	X1, X2 auxil. wdgs	Z1, Z2 auxil. wdgs
L9	0.313	0.433

Field excitation current i_{exc} (A) - 400V - 50 Hz

"i_{exc}": excitation current of the exciter field

Type	No load	At rated load
L9	0.87	2.90

Table of weights

(values given for information only)

Type	Total weight (kg)	Rotor (kg)
L9	215	75

G80-SIIIA

Three-phase: 4-pole, AREP excitation

Resistances at 20 °C (Ω)

43.2	Stator L/N	Rotor	Field coil	Armature
L8	0.063	1.96	4.6	0.23

Resistance of auxiliary windings at 20 °C (Ω)

Type	X1, X2 auxil. wdgs	Z1, Z2 auxil. wdgs
L8	0.21	0.4

Field excitation current i_{exc} (A) - 400V - 50 Hz

"i_{exc}": excitation current of the exciter field

LSA 43.2	No load	At load
L8	0.8	3.2

Table of weights

(values given for information only)

Type	Total weight (kg)	Rotor (kg)
L9	330	120

G100-SIIIA

Three-phase: 4-pole, AREP excitation

Resistances at 20 °C (Ω)

44.2	Stator L/N	Rotor	Field coil	Armature
VS45	0.046	2.51	4.6	0.5

Resistance of auxiliary windings at 20 °C (Ω)

Type	X1, X2 auxil. wdgs	Z1, Z2 auxil. wdgs
VS45	0.3	0.5

Field excitation current i_{exc} (A) - 400V - 50 Hz

"i_{exc}": excitation current of the exciter field

LSA 44.2	No load	At load
VS45	1	4.2

Table of weights

(values given for information only)

Type	Total weight (kg)	Rotor (kg)
VS45	405	140

G150-SIIIA

Three-phase: 4-pole, AREP excitation

Resistances at 20 °C (Ω)

44.2	Stator L/N	Rotor	Field coil	Armature
M95	0.024	3.32	4.6	0.5

Resistance of auxiliary windings at 20 °C (Ω)

Type	X1, X2 auxil. wdgs	Z1, Z2 auxil. wdgs
M95	0.17	0.28

Field excitation current i_{exc} (A) - 400V - 50 Hz

"i_{exc}": excitation current of the exciter field

LSA 44.2	No load	At load
M95	1.2	4

Table of weights

(values given for information only)

Type	Total weight (kg)	Rotor (kg)
M95	515	185

G200-SIIIA

Three-phase: 4-pole, AREP excitation

Resistances at 20 °C (Ω)

44.2	Stator L/N	Rotor	Field coil	Armature
M5	0.0182	0.24	8.8	0.035

Resistance of auxiliary windings at 20 °C (Ω)

Type	X1, X2 auxil. wdgs	Z1, Z2 auxil. wdgs
M5	0.216	0.363

Field excitation current i_{exc} (A) - 400V - 50 Hz

" i_{exc} ": excitation current of the exciter field

LSA 44.2	No load	At load
M5	1.1	3.8

Table of weights

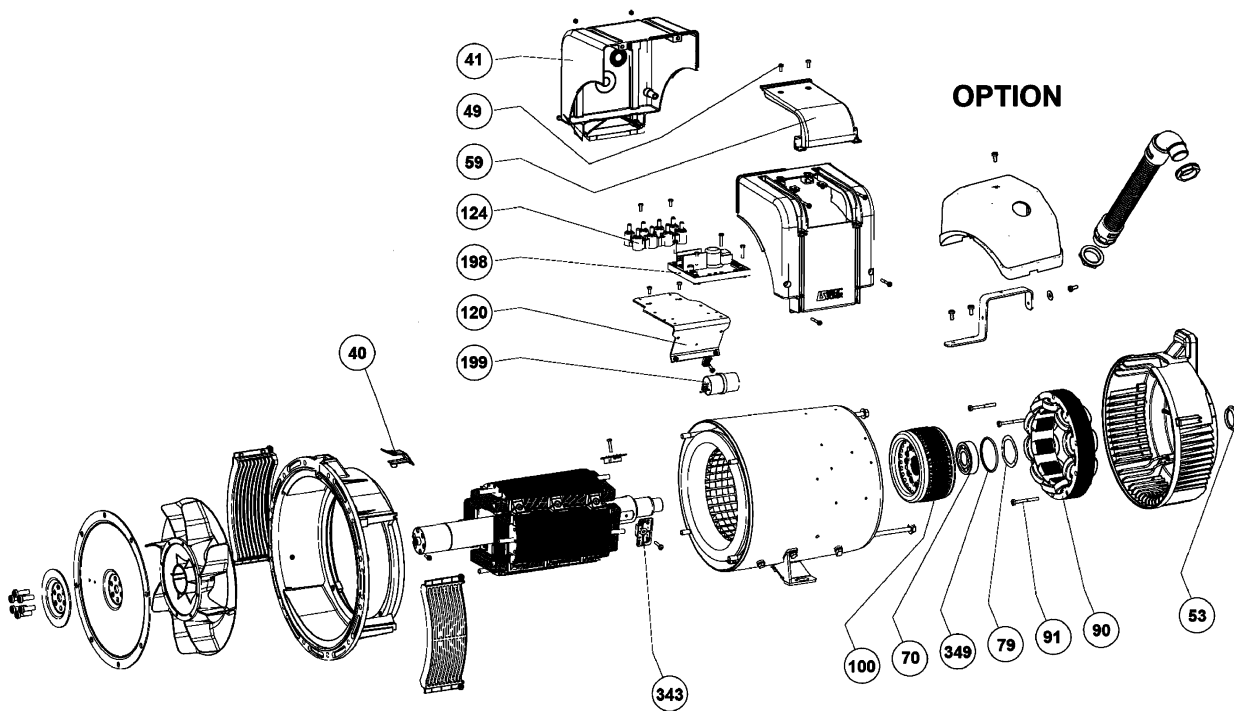
(values given for information only)

Type	Total weight (kg)	Rotor (kg)
M5	700	260

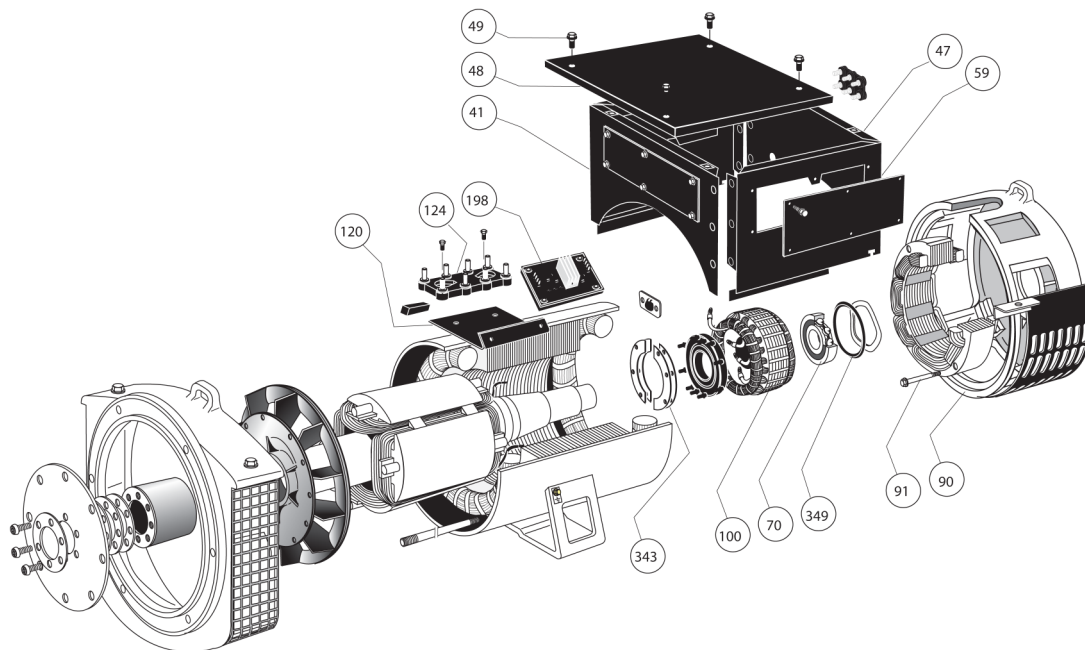
The voltage and current values are given for no-load operation and operation at rated load with separate field excitation. All values are given to be within $\pm 10\%$. All values are given at 50 Hz.

EXPLODED VIEW, PARTS LIST AND TIGHTENING TORQUE

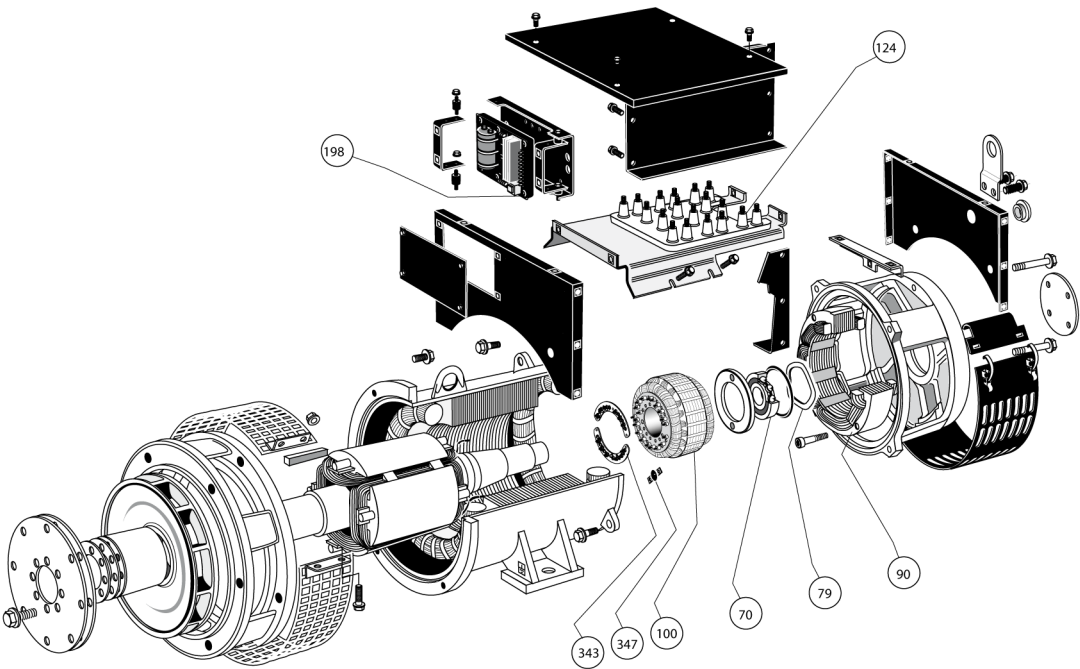
LSA 42.3 single-bearing - G60SIIIA



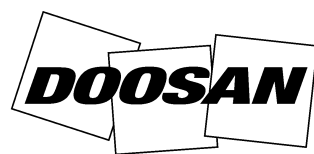
REF.	QTY	DESCRIPTION	SCREW Ø	TORQUE N.M
40	1	Plastic cover	-	-
41	2	Terminal box lid	-	-
49		Terminal box screw	M5	3.6 ±0.4
53	1	Plug	-	-
59	1	Access flap	M5	3.6 ±0.4
70	1	NDE bearing	-	-
79	1	Preloading wavy washer	-	-
90	1	Wound exciter field	-	-
91	4	Field fixing screw	M6	10
100	1	Exciter armature	-	-
120	1	Terminal plate support	M5	6
124	1	Terminal plate	M5	6
198	1	Regulator (AVR)	M5	4 ±0.5
199		Interference suppression module	M5	6
343	2	Direct diode assembly	M5	4
349	1	O ring seal	-	-
-	1	AVR fuses	-	-



REF.	QTY	DESCRIPTION	SCREW Ø	TORQUE N.M
41	1	Cover front panel	-	-
47	1	Cover rear panel	-	-
48	1	Cover top panel	-	-
49	34	Fixing screws	M6	5
59	3	Inspection door	-	-
70	1	NDE bearing	-	-
79	1	Preloading wavy washer	-	-
90	1	Wound exciter field	-	-
91	4	Field fixing screw	M6	10
100	1	Exciter armature	-	-
120	1	Terminal block support	-	-
124	1	Terminal block	M10	20
198	1	Voltage regulator (AVR)	-	-
343	1	Diode bridge assembly	M6	5
349	1	O ring	-	-



REF.	QTY	DESCRIPTION	SCREW Ø	TORQUE N.M
70	1	Non drive end bearing	-	-
79	1	Preloading (wavy) washer	-	-
90	1	Exciter field	-	-
100	1	Exciter armature	-	-
124	1	Terminal plate	M12	35
198	1	Voltage regulator (AVR)	-	-
343	1	Diode bridge assembly	M6	4
347	1	Protection varistor (+ PCB)	-	-



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