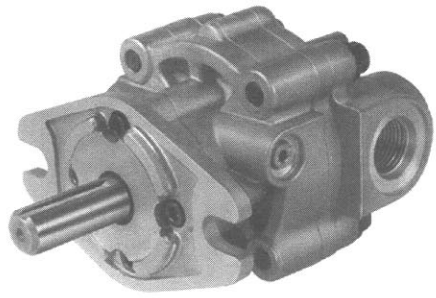
Model **MGG2**

Bi-Directional MGG2 Hydraulic Motors Gerotor Type Internal Gear Five Fixed Displacements



Service and Parts Manual

GRESEN®

DANA

FEATURES

- Simple Gerotor Design
- High Horsepower/Size Ratio
- Lightweight, Aluminum Alloy Housing
- High Pressure Mechanical Seal Permits Series Application To 1000 PSI Back Pressure
- Anti-Friction Bearings
- Buna-N-Seals For Petroleum Base Fluids

This manual contains important warnings and instructions.

Read and retain for reference.

Catalog No. GSP-100

MODEL NO. MGG2 - 0010 - B - A - 1 - A - 3

BASIC MODEL NO.

DISPLACEMENT

	Gallons (Litres) Per Revolution	IN.³ (CM³) Per Revolution
0010	.0010 (,0039)	.218 (3,57)
0016	.0016 (,0062)	.372 (6,20)
0020	.0020 (,0078)	.450 (7,38)
0025	.0025 (,0097)	.580 (9,50)
0030	.0030 (,0116)	.700 (11,48)

DESIGN

A	UNI-DIRECTIONAL
B	BI-DIRECTIONAL
C	SHAFT DUST SEAL

FLANGE ADAPTER

A	2 Bolt AA
B	4 Bolt
C	2 Bolt A

SHAFT ROTATION

1	Clockwise
2	Counterclockwise
3	Bi-Directional

PORT LOCATIONS

MGG20010, MGG20016, MGG20020
SAE 8 (3/4-16 UNF) Both Ports
MGG20025, MGG20030
SAE 10 (7/8-14 UNF) Both Ports

A	2 Rear Ports
B	2 Side Ports
D	2 Side Ports w/adj. By-Pass

SHAFT

1	9/16" STRAIGHT KEYED
2	9/16" 8-TOOTH, 16/32 PITCH, 1.12 FULL SPLINE
*6	5/8" 9-TOOTH, 16/32 PITCH, .87 FULL SPLINE
**8	9/16" 8-TOOTH, 16/32 PITCH, .406 FULL SPLINE
***9	1/2" STRAIGHT KEYED WITH 3/8" THREAD

* Available only in Models MGG20010, MGG20020, MGG20025 and MGG20030
** Available only in Models MGG20025 and MGG20030
*** Available only in Models MGG20010, MGG20016, MGG20025

TECHNICAL DATA

		MODEL NO.				
		MGG20010	MGG20016	MGG20020	MGG20025	MGG20030
DISPLACEMENT PER REVOLUTION		.218 in.³ (3,57 cm³)	.372 in.³ (6,20 cm³)	.450 in.³ (7,38 cm³)	.580 in.³ (9,50 cm³)	.700 in.³ (11,48 cm³)
MAXIMUM RATED RPM		5000	5000	5000	5000	5000
RATED FLOW PER 1000 RPM (NOMINAL)		.95 GPM (3,6 liters/min)	1.61 GPM (6,1 liters/min)	1.95 GPM (11,5 liters/min)	2.51 GPM (9,5 liters/min)	3.03 GPM (11,5 liters/min)
MAXIMUM RATED PRESSURE	CONTINUOUS	2000 PSI (138,0 bar)	2000 PSI (138,0 bar)	2000 PSI (138, 0 bar)	2000 PSI (138, 0 bar)	1500 PSI (103, 5 bar)
	INTERMITTENT	2500 PSI (172,5 bar)	2500 PSI (172,5 bar)	2500 PSI (172,5 bar)	2500 PSI (172,5 bar)	2000 PSI (138,0 bar)
TORQUE PER 1000 PSI* (69,0 bar)		35 in.-lbs. (40 kg-cm)	59 in.-lbs. (68 kg-cm)	72 in.-lbs. (83 kg-cm)	92 in.-lbs. (107 kg-cm)	111 in.-lbs. (128 kg-cm)
WEIGHT		2.8 pounds (1.25 kg)	3.0 pounds (1,36 kg)	3.1 pounds (1,41 kg)	3.3 pounds (1,50 kg)	3.5 pounds (1,59 kg)
SIDE LOAD**		170 lbs. (77,0 kg)	130 lbs. (59,0 kg)	110 lbs. (50,0 kg)	70 lbs. (31,7 kg)	30 lbs. (13,5 kg)

*Theoretical
**SIDE LOAD: Maximum Permissible Shaft Side Load at 2500 RPM and 1000 PSI [69,0 bar] (B_{10} Bearing Life of 1000 Hrs.)

OIL TEMPERATURE: Maximum recommended oil temperature 180°F (82.2°C).

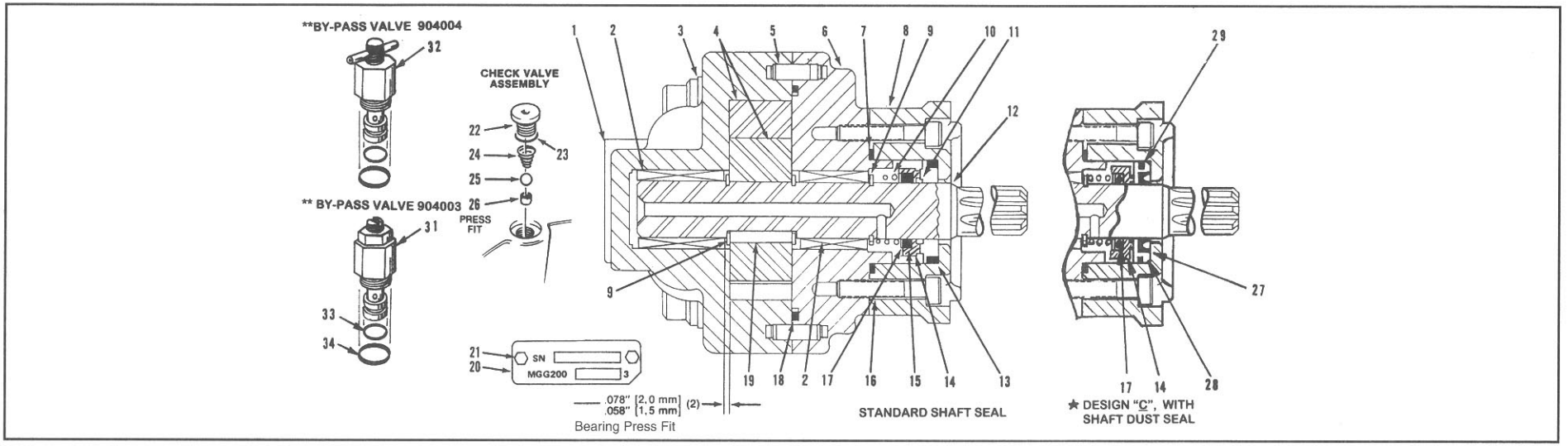
OIL VISCOSITY: Recommended viscosity 150 SUS (3,65 engler). Minimum recommended viscosity 60 SUS (2,1 engler).

FILTRATION: Minimum recommended filtration 10 Micron

⚠ WARNING

Never exceed 2500 PSI (172 bar) hydraulic oil pressure or 5000 RPM

MGG2 HYDRAULIC MOTOR

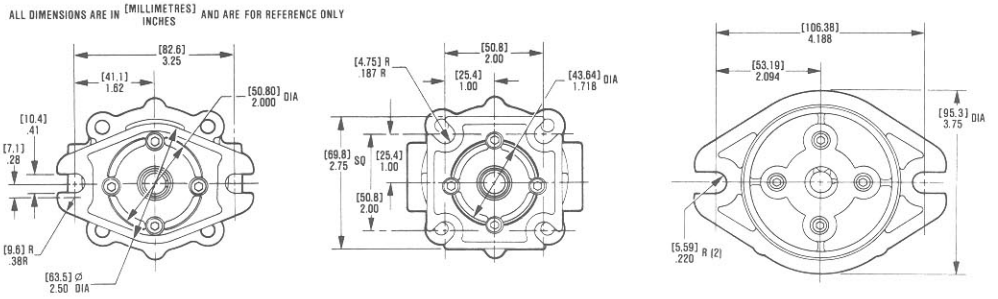


Item No.	Part No.	Description	Quantity
1	See Page 6	Body	1
2	906005	Bearing	2
3	See Page 5	Screw, Body	4
4	See Page 5	Gerotor Element	1
5	906004	Dowel Pin	2
6	907102	Cover	1
7	906008	O-Ring Seal	1
8	See Page 4	Mounting Plate	1
9	906003	Retaining Ring	3
10	906010	Spring	1
11	906012	Seal Seat	1
12	See Page 4	Shaft	1
13	906036	O-Ring Seal	1
14	906011	Cup Seal	1
15	906030	O-Ring Seal	1
16	906002	Screw #10-24 x 1"	4
17	906013	Washer	1
18	906007	O-Ring Seal	1
19	See Page 5	Pin, Drive	
20	8638-001	Nameplate	1
21	906023	Screw, Hex Head, No. 2-56x.12	2
22	906031	Plug, Socket Head, SAE #2	2
23	906042	O-Ring Seal	2
24	906026	Spring	2
25	88830	Ball	2
26	906028	Seat	2
27*	906015	Seal, 'V' Packing	1
28*	906009	Seal Seat	1
29*	906038	O-Ring Seal	1
31**	904003	By-Pass Valve Assem. (Slotted)	1
32**	904004	By-Pass Valve Assem. (T-Handle)	1
33**	55-011-8309	O-Ring Seal	1
34**	55-906-8309	O-Ring Seal	1

904804 **SEAL KIT,**
CONTAINS ITEMS: 7, 11, 13, 14, 15, 18, 27, 28, 29, 33 & 34 LISTED ABOVE.

904824 **SERVICE KIT, (INCLUDES BEARINGS)**
CONTAINS ITEMS: 2, 7, 11, 13, 14, 15, 18, 27, 28, 29, 33 & 34 LISTED ABOVE.

MOUNTING PLATE OPTIONS (Item 8)



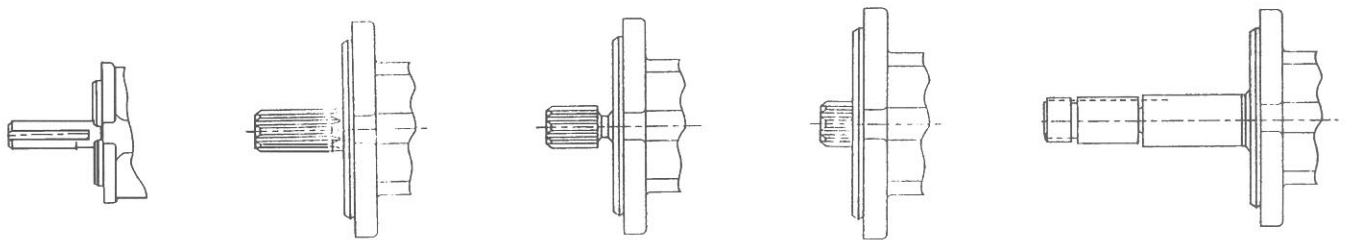
2-BOLT AA FLANGE ADAPTER (OPTION A)

4-BOLT FLANGE ADAPTER (OPTION B)

2-BOLT A FLANGE ADAPTER (OPTION C)

2-BOLT AA FLANGE ADAPTER (OPTION A)	4-BOLT FLANGE ADAPTER (OPTION B)	2-BOLT A FLANGE ADAPTER (OPTION C)
PART NO.	PART NO.	PART NO.
909101	909102	909103

SHAFT OPTIONS (Item 12)



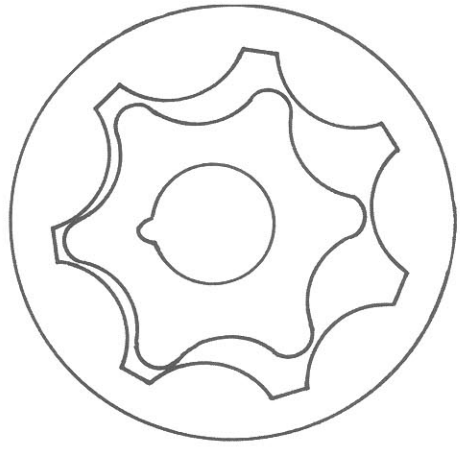
1 2 6 8 9

MODEL NO.	CATALOG NO. 1 9/16" STRAIGHT KEYED	CATALOG NO. 2 9/16" SPLINE 8-TOOTH 16/32 1.12 FULL SPLINE	CATALOG NO. 6 5/8" SPLINE 9-TOOTH 16/32 .87 FULL SPLINE	CATALOG NO. 8 9/16" SPLINE 8-TOOTH 16/32 .406 FULL SPLINE	CATALOG NO. 9 1/2" STRAIGHT WITH 3/8" THREAD
MGG20010	905101	905106	905100	N/A	905112
MGG20016	905102	905107	N/A	N/A	905114
MGG20020	905103	905108	905117	N/A	N/A
MGG20025	905104	905109	905118	905115	905113
MGG20030	905105	905110	905119	905116	N/A

BODY SCREW (Item 3)
DRIVE PIN (Item 19)

MODEL NO.	BODY SCREW PART NO.	DRIVE PIN PART NO.
MGG20010	905401	905301
MGG20016	905402	905302
MGG20020	905403	905303
MGG20025	905404	905304
MGG20030	905405	905305

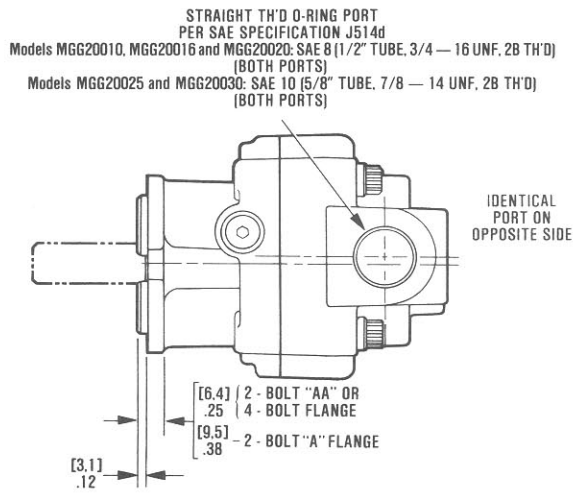
GEROTOR ELEMENT (Item 4)



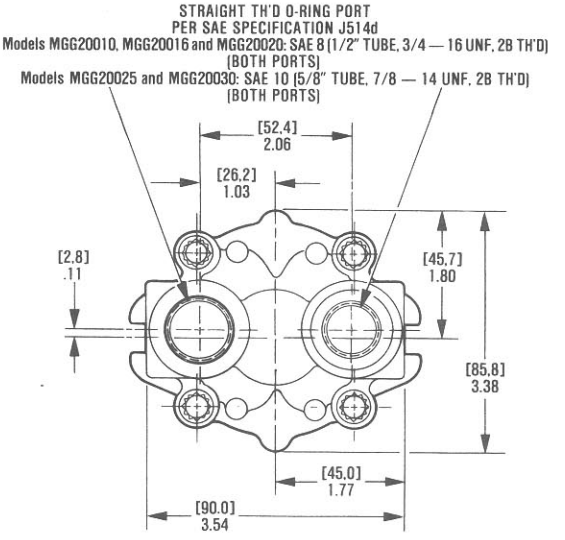
MODEL NO.	PART NO. (INNER AND OUTER GEARS ARE MATCHED SETS)
MGG20010	905201
MGG20016	905202
MGG20020	905203
MGG20025	905204
MGG20030	905205

BODY (Item 1)

SIDE PORTING



BACK PORTING



FOR LEFT HAND ROTATION, PRESSURIZE PORT "A"
FOR RIGHT HAND ROTATION, PRESSURIZE PORT "B"

MODEL NO.	PORT SIZE	PART NO.FOR BODY WITH REAR PORTING	PART NO. FOR BODY WITH SIDE PORTING	PART NUMBER FOR BODY WITH BY-PASS VALVE
MGG20010	#8 SAE	908105	908110	908116
MGG20016	#8 SAE	908106	908111	908117
MGG20020	#8 SAE	908107	908112	908118
MGG20025	#10 SAE	908108	908113	908119
MGG20030	#10 SAE	908109	908114	908120

DISASSEMBLY AND REASSEMBLY INSTRUCTIONS

Refer to Assembly Drawing, Page 3

DISASSEMBLY

1. Remove the 4 screws holding the mounting flange, Item 16.
2. Remove mounting flange, Item 8.
3. Remove the face seal assembly.

   3a. Normally the face seal seat does not have to be removed from the mounting flange. If Items 11 & 13 are to be removed, drive out Item 11 evenly with a soft aluminum or brass punch.
4. Remove exposed retaining ring, Item 9.
5. Hold motor (across port flanges) in a locking fixture such as a vice.

   ⚠ CAUTION: Use wood slats to protect the aluminum housing when clamping.

   Remove the 4 body screws, Item 3.
6. Separate evenly the body, Item 1, and the cover, Item 6, by holding at cover and tapping gently at the port flanges. (Use rubber or plastic mallet.)
7. Remove gerotor gear, Item 4, and shaft, Item 12.
8. Remove 2 retaining rings, Item 9, from the shaft. This will allow the inner gear and drive pin, Item 19, to be removed from the shaft. NOTE: Gerotor gear is a matched inner and outer gear set.
9. NOTE: Do not remove bearings, Item 2, from the housing unless there is absolute evidence of damage. (The needle rollers should be free to rotate and not show signs of surface breakdown.)

REASSEMBLY

1. If bearings have been removed:

   1a Press new bearing, Item 2, into body, Item 1, to a depth of .078/.058" (2,0-1,5 mm).

   1b. Press new bearing, item 2, into cover, item 6, to a depth of .078/.058" (2,0-1,5 mm).

   ⚠ CAUTION: This depth must be maintained to provide clearance for the snap rings on the shaft. Depth is measured from edge of the body and cover counterbore to the bearing race.
2. If dowel pins, Item 5, have been removed, insert dowel pins into cover, Item 6.
3. Assemble drive pin, Item 19, and inner gear, Item 4, onto shaft, Item 12.
4. Install retaining rings, Item 9, on each side of the inner gear assembly.
5. Slip the outer gear, Item 4, into gear pocket in the motor body, Item 1.
6. Install shaft assembly, Item 12, to gear pocket.
7. Insert O-ring seal, Item 18, into groove in motor cover, Item 6.
8. Hold motor in locking fixture.

   ⚠ CAUTION: (Use wood slats to protect aluminum housing when clamping), and install 4 body screws. Torque to 21-24 ft./lbs. (28,5-32,5 Nm).

   NOTE: After torquing of screws, motor shaft must rotate freely.
9. Install outer retaining ring, Item 9, on shaft.
10. Slip spring, Item 10, over end of shaft until it contacts retaining ring, Item 9.
11. Slip washer, Item 17, over end of shaft to contact spring.
12. Assemble seal, Item 15, to cup seal, Item 14, and install (lip out) to shaft, Item 12.

    NOTE: This does require special tool (#906021).

13A. <u>STANDARD SHAFT SEAL DESIGN:</u>
Install "O" ring, Item 13, into seal seat, Item 11.

13B. <u>DESIGN "C" with SHAFT DUST SEAL:</u>
INSTALL "O" ring, Item 29, and "V" Seal, Item 27, into seal seat, Item 28.

14. Lubricate and install seal seat, assembly 11, or assembly 28, into mounting flange counterbore (lip of seal out)
15. Install "O" Ring seal, Item 7, in groove on mounting face.
16. Install mounting flange assembly, Item 8.
17. Install 4 mounting flange screws, Item 16. Torque to 46-54 in./lbs. (5,2-6,1 Nm).
18. Fill Port "A" with clean hydraulic oil and rotate shaft clockwise until oil drains from Part "B".

TERMS AND CONDITIONS

1. **PRICES -** Quotations are subject to change without notice and cover only the quantity specified. Due to conditions affecting prices we will accept orders with the understanding we reserve the right (notwithstanding any price stated in this quotation or in the order) to change the price at any time, or from time to time, as to any part of the order then unfilled. Delivery of any part of an order at the price stated therein shall be without prejudice to our right, as above stated, to change the price as to any remaining part of said order.

2. **WARRANTY -** Dana Corporation's Gresen Hydraulic Division warrants those products listed in its current Gresen, Hyco and Tyrone product line catalogs against defects in materials and workmanship when properly installed and maintained for 18 months from the earlier of the date the product is first put into service or for 24 months from the date of shipment.

   Products must be returned to the Dana location from which it was shipped, freight prepaid, for Inspection and, if appropriate, repair or replacement by Dana. Dana will replace or repair free of charge any part of any product that Dana's Inspection shows not to be in compliance with this warranty. Valid claims will receive freight reimbursement.

   This warranty is null and void if in the judgment of Dana, the part has been used in the wrong application, damaged, improperly maintained or repaired, subjected to inappropriate environmental and operating conditions, repaired by a non-Dana party without prior authorization from Dana, not used in accordance with Dana operational and service recommendations, or repaired with other than Dana approved parts.

   THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED AND MAY BE VARIED ONLY BY A SEPARATE AGREEMENT SIGNED BY A DULY AUTHORIZED REPRESENTATIVE OF DANA. NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE BY DANA CORPORATION. THE FOREGOING STATES DANA CORPORATION'S ENTIRE AND EXCLUSIVE LIABILITY AND BUYER'S EXCLUSIVE AND SOLE REMEDY IN CONNECTION WITH THE SALE OF THE PRODUCTS HEREUNDER. IN NO EVENT SHALL DANA CORPORATION BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHATSOEVER INCLUDING LOSS OF USE OR TRAVEL, LABOR OR MATERIAL COSTS TO REMOVE OR REINSTALL THE PRODUCT.

3. **PATENTS -** Intellectual Property: If the goods sold hereunder are to be prepared for manufacturer according to buyer's specifications, buyer shall indemnify seller against claims or liability for infringement or misappropriation of any patent, trademark, copyright, trade secret or any other intellectual property right on account of such manufacture. To the best of seller's knowledge, the articles purchased or to be purchased hereunder do not infringe any letters, patents granted to others by the United States or any foreign country. Seller shall reimburse buyer for damages awarded against it as a result of any intellectual property infringement or misappropriation action conditioned on the following: (1) Seller must be notified promptly in writing by the buyer of any notice of such claim; (2) Seller may, at its option, participate in the defense of such an action, and, if seller does participate, it will have sole control of the defense and all negotiations for settlement are compromised; and (3) Should the seller's products become or in the seller's opinion be likely to become the subjects of a claim for infringement or misappropriation, the buyer will permit the seller, at seller's option, to replace or modify the same so that it becomes not infringing or grant buyer a credit for such products as depreciated and accept its return.

4. **CANCELLATION -** Cancellation of orders once placed with and accepted by us can be made only with our consent. Should the Purchase, due to change in design or other good and sufficient cause, desire to effect cancellation of the order, same will be accepted on the following basis.

   Purchaser to pay the purchase price in full for all articles completed and ready for delivery; and a percentage of the purchase price on such items as shall not be completed, equivalent to the percentage of completion thereof.

   Purchaser shall also pay in full the costs of all materials, dies, tools, patterns and fixtures, provided for this order, that are on hand or for which we are obligated together with all labor and other expense incurred in connection therewith. Invoices covering said costs shall be due and payable immediately upon our acceptance of cancellation.

5. **LAWS -** To the best of our knowledge, we are complying with all state and federal laws. Our acceptance of your order and our obligations thereunder are subject to all applicable state and federal laws and rules and regulations issued thereunder.

6. **DELIVERIES -** While we shall endeavor to schedule your order for delivery as nearly in accordance with your instructions as possible and advise you accordingly, we do not guarantee nor assume liability for failure to meet any delivery dates.

7. **TAXES -** Any tax imposed on Dana Corporation by any law on the sale or use of articles made or sold by us shall be in addition to the sales price thereof.

8. **TERMS OF PAYMENT AND FAILURE TO PAY -**

   a. If terms of payment stated in the order are different from our quoted terms, the latter shall apply to the order.

   b. Purchaser shall make prompt payment of our invoices in accordance with quoted payment terms. Failure to make such payment or failure to make prompt payment on any existing contract with us, shall entitle us to suspend delivery until all payments due are made or arrangements satisfactory to us are made, or to cancel any such contract. Such rights are not exclusive and are in addition to any other right or remedy we may have and the exercise of such rights shall not prejudice any claim for damages we may assert.

9. **TRANSPORTATION -** Delivery is F.O.B. shipping point as designated by catalog or price list. In absence of shipping instructions, Seller will use own discretion in choice of carrier. Seller assumes no responsibility for insuring shipments unless specifically requested by Buyer and then at his expense and valuation.

10. **INSPECTION -** The items ordered as a result of this quotation will be manufactured in accordance with the latest prints and specifications in our possession. Quality inspection will be performed to the extent practical to assure conformance of the end item only to the final assembly drawing covering that item as accepted by the Seller.

11. **GENERAL -** There will be no understandings, agreements or warranties, implied, verbal or written, with respect to this quotation that are not fully expressed herein and no change can be made in this quotation unless reduced to writing and signed by both parties. No statement, recommendation or assistance made or offered by us through our representative to the Purchaser or his representative in connection with the use of any product sold by us shall be or constitute a waiver by us of any of the provisions hereof or affect the obligations of the respective parties under any order received from you as modified by these conditions.

12. **ACCEPTANCE -** Seller's acceptance of any purchase order is limited to buyer's assent to the expressed terms contained on the face and back of this document. Any proposal for additional or different terms, or any attempt by buyer to vary any of the terms of this document is rejected, but such proposal shall not operate as a rejection of buyer's offer unless such variances are in the terms of the description, quantity, price or delivery of the goods but shall be deemed a material alteration thereof, and the terms of this document shall be deemed accepted by buyer without said additional or different terms. If this document shall be deemed an initial offer, buyer's acceptance is limited to the expressed terms contained on the face and the back hereof.

13. **FORCE MAJEURE -** Dana will not be liable for delays or other failures in performance arising from strikes or other labor difficulties, labor shortage, fire, flood, war, breakdowns of or failure of plant machinery or equipment, delays in or lack of transportation, actions of governmental entities, delays of suppliers, or any other cause beyond the reasonable control of Dana.

14. **CHANGES -** Seller shall have the right at any time to make changes in drawings, designs, specifications, materials, packaging, time and place of delivery and method of transportation. If any such changes cause an increase or decrease in the cost, or the time required for performance, an equitable adjustment shall be made and this agreement shall be modified accordingly. Buyer agrees to accept any such changes subject to this paragraph.

15. **TOOLING -** Any equipment which seller constructs or requires for use in the production of materials for the buyer shall be and remain seller's property. Seller shall use its best efforts to handle and store any materials in its possession furnished by the buyer carefully, but seller shall not be liable for any damage or loss thereof.

GRESEN®

DANA

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