LIST OF RCAF REVISIONS

ROYAL CANADIAN AIR FORCE

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PAINTING AND MARKING OF GROUND HANDLING EQUIPMENT

"REVISION"

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ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF

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Revised 23 Feb 62

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LIST OF RCAF REVISIONS

DATE	PAGE	NO	DATE	PAGE	NO
10 Dec 58	3				
10 Aug 60	1				
23 Feb 62	3				
23 Feb 62	4				
23 Feb 62	5				
23 Feb 62	9				
23 Feb 62	11				
23 Feb 62	13				
23 Feb 62	14				

PAINTING AND MARKING OF GROUND HANDLING EQUIPMENT

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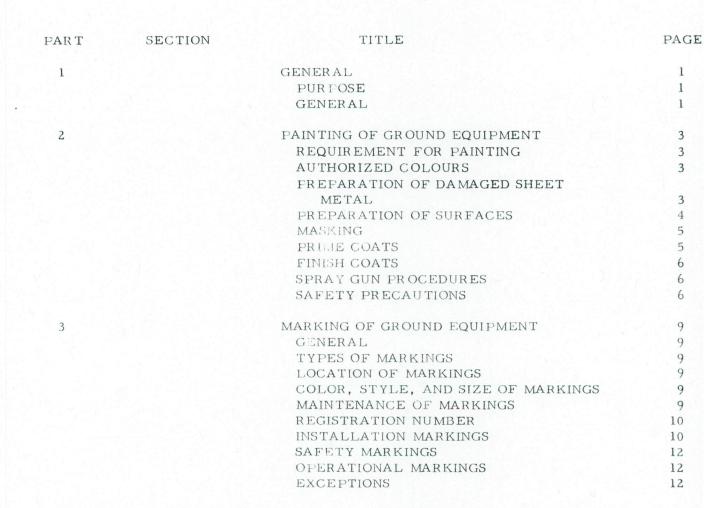
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II JUN 58

Revised 23 Feb 62

TABLE OF CONTENTS



LIST OF ILLUSTRATIONS

Figure	Page
1	10
2	11

TABLE OF CONTENTS

		1
	PAINTING OF GROUND EQUIPMENT REQUIREMENT FOR PAINTING AUTHORIZED COLOURS FREPARATION OF DAMAGED SHEET METAL FREPARATION OF SURFACES MARKUNG PRILE COATS FINISH COATS SPRAY GUN PROCEDURES SAFETY PRECAUTIONS	
9 9 9 9 10 10 12 12 12		

LIST OF ILLUSTRATIONS





PART 1

GENERAL

PURPOSE

1 The purpose of this Engineering Order is to provide instructions and procedures for the painting and marking of ground equipment assigned to the RCAF.

GENERAL

The provisions herein apply to all ground equipment assigned to the RCAF. Under the terminology "Ground Equipment" are included such items as:

- (a) Aircraft tow bars, chocks, cradles, dollies, hoists, jacks, ladders, scaffolds, stands, supports, utility trailers, etc.
- (b) Cleaners, compressors, coolers, engine or motor driven generator sets, heaters, hydraulic test stands, and similar equipment.
- (c) This Engineering Order does not apply to vehicular mobile equipment.
- (d) Further instructions with regard to painting etc. may be found in, Canadian Army EME Manual General T100.





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PAINTING OF GROUND EQUIPMENT

REQUIREMENT FOR PAINTING

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1 Ground equipment will be painted when it is determined that inadequate protection is afforded against rust or corrosion and not merely to change the color or gloss characteristics. Equipment will not be repainted if finish is still serviceable.

SPOT PAINTING TEST IIA LESSON STANDARDS

- 2 Previously painted sections which are not properly blended will be spot painted in lieu of complete refinishing provided that not more than 25 percent of the entire surface is affected.
- 3 Painted sheet metal which has become bare and exposed due to deterioration of paint or accident will be immediately spot painted to prevent further deterioration.

AUTHORIZED COLOURS

- Ground equipment used on landing strips, taxi ways, perimeter roads, aircraft flight areas, parking and hangar areas, (including equipment being used in hangar), will be painted externally with enamel to CGSB Spec 1-GP-88P colour to CGSB Spec 1-GP-12b yellow 5-2, and internally with enamel to CGSB Spec 1-GP-88P colour to CGSB Spec 1-GP-12b grey 1-7.
- 5 Items of ground equipment permanently operated in areas other than those listed above will be painted with enamel CGSB Spec 1-GP-88B colour to CGSB Spec 1-GP-12b grey 1-10.
- 6 Portable wooden ladders shall be coated with clear lacquer or shellac for preservation.

These items shall not be painted with opaque material as this practice conceals the defects in the wood.

- 7 Shop equipment permanently installed or fixed in hangars will be painted with enamel to CGSB Spec 1-GP-88P colour to CGSB Spec 1-GP-12b grey 1-10.
- 8 Engines, engine accessories, and components will be painted with enamel, heat resisting to CGSB Spec 1-GP-76a colour to CGSB Spec 1-GP-12b colour grey 1-10. Engine coolling baffles and cowlings will be painted original colour. Air cooled cylinder fins shall not be painted.
- 9 Battery boxes and areas surrounding the battery, that are susceptible to contamination by spilled or overflowing acid will be painted with varnish, asphalt, black acid resistant.
- 10 If camouflage painting is required, this shall be carried out using paint, exterior, quick drying, flat CGSB Spec. 1-GP-49a.

PREPARATION OF DAMAGED SHEET METAL

- Prime requisite for high quality, smooth, even finish on equipment depends upon the preparation of sheet metal sections, prior to painting. The specific type of equipment concerned should be the governing factor in determining the number of man-hours to be expended in repair of sheet metal damage.
- 12 All bumps and dents causing any change in the original contour of sheet metal will first be roughed out with proper body tools. Hydraulic jacks and heat may be applied as necessary.

Old paint can be removed with a grinder equipped with a #16 grade grinding disc prior to filing: Grinder marks can be removed and feathered edging accomplished with electric or airdriven sanders. A #24 grade disc may be used on heavy equipment to conserve man-hours and in cases where maximum quality is not justifiable or required.

- Rough areas resulting from welding should be removed with a power grinder using #16,24 or 36 grade sanding disc, as appropriate.
- Body solder can be used where it is determined to be practical and expedient. File smooth and sand solder-filled areas with appropriate grit sanding discs or sandpaper.
- Thoroughly remove all excess solder acid, oil or grease deposited by solder paddle with a solution of one part metal conditioner 31-GP-107 to three parts water. When mixing acid and water, the acid will always be poured slowly into the water and the mixture stirred. Personnel will wear appropriate protective clothing to prevent acid contact with eyes and skin.
- Bare metal surfaces will be treated immediately with a solution of metal conditioner, as in para 15.

PREPARATION OF SURFACES

CLEANING

- 17 Cleaning of surfaces will be carried out as follows:
- (a) Protect all electrical equipment such as generator regulators, generators, starters, distributors, etc., from direct impact of cleaning jets when using vapor or steam cleaning compounds. Disconnect battery cable prior to steam cleaning engine compartments.

- (b) Clean engine exterior, fire wall, side pans, and under side of hood, using cleaning compound and hot water.
- (c) Wash entire battery and carrier with a colution of sodium bicarbonate.
- (d) Completely clean the equipment base by applying under pressure a solution of hot water and vapor cleaning compound. Remove deposits of oil, grease and foreign materials from recessed parts of springs and axles.
- (e) Wash the equipment with a pressure type power washer. Remove all deposits of cleaning compounds by using high pressure moisture free compressed air.
- (f) When the surface to be refinished is checked, cracked, or rusted, remove the paint down to the bare metal. All bare metal surfaces to be painted must be dry and free from all rust and loose scale by wirebrushing, applying phosphoric acid metal conditioner, or flame descaling.

NOTE

This work will not be performed in the spray painting area or where spray painting is in progress.

(g) When paint cannot be sanded to a smooth finish for overspraying without excessive expenditure of man-hours, residual paint may be stripped by use of paint remover, CGSB Spec 1-GP-78 or 31-GP-278.

NOTE

Do not apply this compound to rubber seals.

(h) Rust-preventive compound that has been applied to parts and sections of the sheet metal and bodies may be removed by a spray applica-

tion of a mixture of one part of grease cleaning compound, one part trichlorethylene, and three parts cleaner Spec 3-GP-8a. Allow to penetrate for approximately five minutes and then respray. Before it dries, remove the softened material with a steam cleaner. If removal is incomplete and re-application of the solvent is considered necessary, water condensed from the steam cleaning must be allowed to dry completely before re-spraying with the solvent. This work will only be performed in exhaust ventilated booths with a minimum face velocity of 250' per minute. No more than one operator will normally work in the booth at one time except when operational necessity requires more than one operator in the booth. All operators will wear air respirators, and other appropriate protective clothing to avoid skin contact with sprayed solvents.

(j) When paint is removed before application of primer surfacer, wipe or brush onto bare metal surfaces one coat of phosphoric acid metal conditioner consisting of one part acid to two parts water. Dry surfaces thoroughly with high pressure moisture free compressed air.

MASKING

- Prior to spray gun operation, it is necessary to cover or mask all parts such as rubber and chrome moldings, gauges, lubrication fittings, instructions, and similar components which are not required to be painted. Unpainted radiator cores will also be masked to prevent the application of paint which may contribute to cooling system overheating. Radiator cores originally painted by the contractor will be repainted only to the extent necessary to prevent corrosion.
- 19 Small areas or irregular shaped parts will be covered with crepe-backed masking tape. Large areas will require a sheet of wrapping or other paper slightly smaller than the part to be masked. This will be held in place by

a strip of masking tape. Overlap the edge of the paper with tape applied to the surfaces being masked. Masking provides a convenient method for spray painting to irregular outlines.

- 20 Paste-like materials may be applied to areas where paint is not desired, and when the paint is dry, these areas may be wiped clean.
- When spraying engines, the use of bandages and socks instead of masking tape to protect rubber hose, ignition wires, and flexible tubing saves much time and material. The bandages will be fabricated from pieces of cloth cut to fit the part to be covered, the length being determined by the length of the object and allowing the bandage to overlap about one-half the circumference. Draw strings at each end, a string around the center of the bandage and tucked under prevents overspray from contacting the protected part. The sock is a cloth bag which fits over the ignition wires and distributor cap and has a draw string which is drawn and tied below the distributor cap.

PRIME COATS bestrodies ton

- 22 Prime coats will be applied as follows:
- (a) The first coat of surface primer will be applied within five hours after completion of cleaning or treatment of bare metal surfaces. Allow to dry thoroughly and sand lightly. For steel, apply one thin coat of primer conforming to CGSB Spec 1-GP-81b. For aluminum and its alloys, apply one thin coat of zinc chromate primer conforming to 1-GP-132a.
- (b) Apply one or two coats, as required, of clear varnish, oil, type to wood surfaces allowing a minimum of one hour drying time between coats.
- (c) Such assemblies as oil pans, transmissions, transfer cases, differentials, mufflers, and tailpipes which are required to dissipate heat will not be coated.

FINISH COATS

- 23 Finish coats will be applied as follows:
- (a) Apply one coat of enamel of the appropriate color as specified in paragraphs 4 to 10, Part 2. This coat should be a thin mixture applied in a manner to facilitate quick drying and provide a tacky surface for the application of the final coat. Apply final coat before the initial coat is thoroughly dry.
- (b) This second or final coat should be applied with a mixture as prescribed by the paint manufacturer adequate for complete coverage to produce a smooth even surface free from runs, sags, and overspray.
- (1) Utilization of enamel finishes will provide a high luster, therefore, the application of rubbing compounds and/or like materials is not authorized or necessary.
- (2) Simonizing, waxing, or polishing of RCAF equipment by commercial contract is not authorized.

SPRAY GUN PROCEDURE

- 24 To obtain the best results when spray painting, the gun should be held perpendicular to the work at all times and approximately six to ten inches from the surface. The proper stroke is made with a free arm motion, keeping the face of the air cap parallel with the surface at all points of the stroke. The ends of the stroke are feathered out by beginning the stroke before pulling the trigger of the gun and releasing the trigger just before ending the stroke. Avoid arcing the gun during the stroke to prevent uneven application and excessive overspary at the end of the stroke.
- Adjust gun to operate at maximum speed consistent with material, rate of flow, surface, and individual skill.

SAFETY PRECAUTIONS

- The safety precautions contained in Engineering Order 00-80-4/ series which are applicable to the operation of paint shops and spray painting of equipment will be adhered to during cleaning and repainting of ground equipment. The following specific safety precautions will be taken to insure the safety of personnel and to prevent accidental damage to equipment.
- (a) Mask, gas, pressure cylinder type, full face piece. RCAF Ref. 22G/1382 shall be worn for continuous operations, mask gas, cannister type, paint spray RCAF Ref. 22G/452 shall be worn for short duration painting operations. One or the other type of mask shall be worn at all times when painting is in progress.
- (b) All indoor spray painting will be accomplished in a paint spray room equipped with spray booths having a minimum face air velocity of 250' per minute.
- (c) Preparations containing benzene or benzol will not be used for spraying. Inhalation of these fumes is extremely injurious to health.
- (d) Never use flammable solvents to clean the walls of spray booths or any part of the equipment.
- (e) Smoking is prohibited in the paint shop. The mist that comes from a spray gun is highly flammable and a spark or flame of any type will cause it to flash or explode.
- (f) Accumulations of paint spray dust in booths and in cracks and corners of the paint shop is hazardous as it is highly flammable and thick coatings of it are subject to spontaneous combustion. It also causes deposits on newly painted surfaces when exposed to sudden drafts. To eliminate this hazard it is essential to keep the paint shop clean. Walls of paint shops and paint spray booths may be covered with paper, which should be replaced when dirty. The paint





and/or paint residue removed from the booth should be removed from the building and safely disposed of immediately as it is subject to spontaneous combustion.

- (g) Dirty rags and paper refuse will be kept in separate metal containers with self-closing lids and appropriately marked. The contents will be removed and disposed of at the end of each operating shift.
- (h) All electrical equipment in the painting area will be of the type required by the CSA approved equipment list. The equipment will be installed in accordance with CSA electrical code.
- (j) All supplies of paints, thinner, etc., authorized within the paint room will be kept in a metal cabinet with vent holes to prevent accumulation of vapors. Thinners, solvents, and other highly volatile flammable agents will be kept in approved safety cans.
- (k) All paint spraying equipment will be

kept thoroughly clean and will be inspected frequently to insure that it is in a serviceable condition.

- (m) Frequent inspections will be made of electrical equipment by qualified electricians to insure proper operation and to eliminate fire hazards due to short circuits, defective electric switches, or improper maintenance.
- (n) The paint spray room or paint spray booths will be protected by an adequate quantity of the proper size and type fire extinguishers (CO_2) .
- (p) All personnel engaged in acid or caustic cleaning operations will wear rubber gloves aprons, boots, goggles, and approved protective equipment.
- (q) No acid or other oxidizing agents will be permitted in the paint room or stored where they may come in contact with painting materials at any time.



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MARKING OF GROUND EQUIPMENT SINCE MOON SO SOLDINGS

GENERAL

1 Ground equipment as defined in Part 1, paragraph 2, may be required at the discretion of the command concerned, to bear identification markings consistent with safe practice, types and models, and the availability of space.

TYPES OF MARKINGS

INSTALLATION MARKINGS

Installation markings will be applied to all ground equipment assigned to or upon receipt, by the base or unit by which they are to be operated. The markings will be carried on the equipment at all times while it is so assigned. These markings will be removed when the equipment is transferred from the jurisdiction of the command concerned.

SAFETY MARKINGS

3 Safety markings will be applied to all ground equipment to indicate danger and prevent injury to personnel or damage to equipment.

OPERATIONAL MARKINGS

- 4 Operational markings will be applied to indicate such requirements as; "voltage and power rating", "fuel octane rating", "tire pressure", etc.
- 5 Letters and numerals will be sharply defined block type. Unless otherwise specified, the size selected will be largest size practiceable in available space consistant with good appearance and visibility.

LOCATION OF MARKINGS

6 The various types and models of ground equipment prohibits the establishment of de-

tailed instructions for the application of markings for each type of model.

(a) The registration number on ground equipment assigned to private contractors will be stenciled on the underside of the hood, inside of a door or some other inconspicuous place.

NOTE

Until such time as registration numbering system is fully implemented, serial
numbers will be utilized.

(b) The roundel, will be painted on the hood or top and both sides of the equipment. On horizontal surfaces the roundel will be placed so that the middle one of the five points of the maple leaf is directed toward the rear of the unit; on vertical or nearly vertical surfaces, this point will be squarely up.

COLOUR, STYLE AND SIZE OF MARKINGS

- 7 Markings will be accomplished by using paint to CGSB Spec 1-GP-88B or ink to CGSB Spec 1-GP-12b colour black 10-1 on equipment painted yellow or grey.
- 8 Block type letters and numerals of 1" or 3" size will be used for marking.

MAINTENANCE OF MARKINGS

- 9 Markings will be clearly maintained on all units of equipment at all times except as follows:
- (a) Upon transfer from the RCAF, all Air Force markings will be removed.

- (b) Upon transfer within the RCAF, all organizational markings will be removed.
- (c) Upon permanent transfer to disposal agencies or upon sale to commercial contractors, all Air Force markings will be obliterated or removed.
- When the requirements for camouflage or concealment outweights the requirement for identification, the markings prescribed herein may, by direction of the command concerned, be obliterated by some readily removable substance.

REGISTRATION NUMBER

11 RCAF registration numbers will be applied to RCAF ground equipment when such numbers have been assigned in accordance with pertinent instructions. These numbers will be applied to equipment in accordance with preceding instructions.

INSTALLATION MARKINGS

- 12 Markings for ground equipment assigned for use by repair depots, bases and detachments shall be in three groups.
- (a) The first group will be a red maple leaf in a blue circle of 3" size, either painted or a decal, to indicate the RCAF as in Figure 1.

(b) The second group will indicate the command to which the equipment is assigned. This group will consist of the letter abbreviations for the command concerned, as follows:

ADC	Air Defence Command
ATC	Air Transport Command
AMC	Air Materiel Command
MAC	Maritime Air Command
IAC	Tactical Air Command
10	Training Command
1 AD	#1 Air Division
5 AD	#5 Air Division

- (c) The third group will be a coloured 1 x 3" block to designate the assigned operator when more than one command and/or squadrons are operating from the same location or base and they wish to have distinction of equipment. The exact colour to be used shall be laid down by the base Chief Technical Officer.
- 13 The markings as prescribed in para 14 will be applied to all ground equipment, however, the location of identification on the rear of the equipment is not definitely prescribed due to the various types of design characteristics of the many type of ground service and support equipment involved. The location and arrangement of identification, however, will be such, that it will not be exposed to excessive abrasive action under normal operation and so that the unit of equipment may easily be identified by the unit concerned.

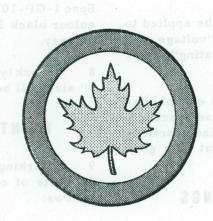


Figure 1

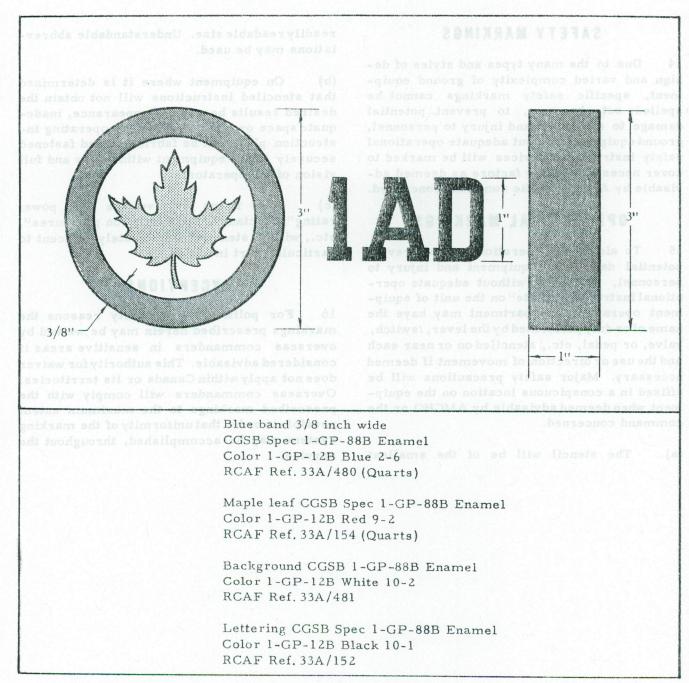


Figure 2 (Issue 1)

SAFETY MARKINGS

Due to the many types and styles of design and varied complexity of ground equipment, specific safety markings cannot be spelled out, however, to prevent potential damage to equipment and injury to personnel, ground equipment without adequate operational safety instructions devices will be marked to cover necessary safety factors as deemed advisable by AMCHQ or the command concerned.

OPERATIONAL MARKINGS

- To aid in the operation and to prevent potential damage to equipment and injury to personnel, equipment without adequate operational instruction "Plate" on the unit of equipment operator's compartment may have the name of or duty performed by the lever, switch, valve, or pedal, etc., stenciled on or near each and the use or direction of movement if deemed necessary. Major safety precautions will be affixed in a conspicuous location on the equipment when deemed advisable by AMCHQ or the command concerned.
- (a) The stencil will be of the smallest

readily readable size. Understandable abbreviations may be used.

- (b) On equipment where it is determined that stenciled instructions will not obtain the desired results because of appearance, inadequate space or other reasons, an operating instruction plate will be fabricated and fastened securely to the equipment within easy and full vision of the operator.
- (c) Such items as "voltage and power rating", "octane", "tire inflation pressures", etc., will be stenciled immediately adjacent to particular part involved.

EXCEPTIONS

16 For political or security reasons the markings prescribed herein may be waived by overseas commanders in sensitive areas if considered advisable. This authority for waiver does not apply within Canada or its territories. Overseas commanders will comply with the prescribed markings to the maximum extent possible in order that uniformity of the marking system may be accomplished, throughout the service.

MATERIAL REQUIRED FOR PAINTING AND MARKING

INFO	ORM.	AT	ION
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The following materials are required for compliance with this EO:

RCAF REF.	NOMENCLATURE	REMARKS
33A/155 and ballquad	Enamel (CGSB Spec 1-GP-88B Colour 1-GP-12b Yellow 5-2	Supplied in quarts
33A/153 aup of ballaque	Enamel (CGSB Spec 1-GP-88B Colour 1-GP-12b Grey 1-10)	Supplied in quarts
33A/335	Enamel heat resisting (CGSB Spec 1-GP-76 Colour 1-GP-12B Grey 1-7)	
33A/8010-21-106-6042	Lacquer cellulose nitrate, clear	
33A/94	Shellac	
33A/33	Coating Compound, black, acid resistant CGSB Spec. 1-GP-108a, type 2	
33A/456	Remover, paint (CGSB Spec 1-GP-78 or 31-GP-278)	
33C/8030-21-800-6014	Metal Conditioner (CGSB Spec 31-GP-107)	
33C/6810-21-572-2566	1-1-1, Trichloroethane	
33C/790	Cleaning Compound MIL-C-25769B	
22G/1382	Respirators, gas, pressure cylinder type	
22G/452	Respirators, gas, cannister type	
33A/119	Thinner 1-GP-70c	For use with enamel Spec 1-GP-88B and Primer 33A/509
33A/466	Thinner 1-GP-50d	For Lacquer 33A/442
33A/529	Primer, Zinc Chromate 1-GP-132a	
33A/509	Primer Red Oxide (CGSB Spec 1-GP-81b, type 1)	
33A/541	Varnish, Oil type, Gloss 1-GP-99a	
33C/182	Cleaner (CGSB Spec 3-GP-8a)	
33A/541	Varnish	

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RCAF REF.	NOMENCLATURE	REMARKS
33G/103	Tape Masking l" Wide	
33A/480	Enamel (CGSB Spec 1-GP-88b)	
REMARKS	Colour 1-GP-12b Blue 2-6)	Supplied in quarts
33A/154	Enamel (CGSB Spec 1-GP-88b) Colour 1-GP-12b, Red 9-2	Supplied in quarts ARE
33A/481	Enamel (CGSB Spec 1-GP-88b) Colour 1-GP-12b, White 10-2	Supplied in quarts
33G/186	Decal (3 inch roundel) Ink, Stencil for marking non porous surfaces (CGSB Spec 1-GP-107)	Supplied in qty of 10