

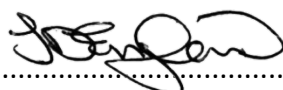


CT0101

COMPONENT SUPPLIERS TOOLING CONTROL DOCUMENT

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APPROVED BY:



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Central Tooling Manager

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REVISION HISTORY

Issue	CHANGE DESCRIPTION	ISSUE DATE
18	LMW references changed to LUK 3. Definitions added. 5.9 – ‘Material master number’ must now be included on the certificate of conformity/purchase order compliance certificate. 5.11 – Section has been added. 10.3 – Section has been added. 10.4 – Section has been added. 11.2 – Section re-worded. 16.1 – Section Re-written, including: ‘Material master number’ added to marking on ident plates, and permanent marking on tools where an ident plate is not viable. 18.1 – Section re-worded. Change Request Form removed from appendices.	13/07/2022

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PART ONE

1. SCOPE AND AUTHORITY

1.1 Introduction

This is the definitive document to qualify the Terms and Conditions to be conformed to, by Suppliers producing *tooling* to support LUK contracts.

1.2 Suppliers

The document sets out the *tooling* policies and requirements to be followed by Component Suppliers participating in the manufacture of *tooling* and/or use of *tooling* supplied to support the production of aircraft parts, components and assemblies. It does not cover, nor is it a requirement for standard tools, consumable tools e.g. drills, reamers, cutters, etc., and equipment e.g. spanners, micrometers, machine tools, etc. However, any validation, inspection, measurement or test equipment must be controlled within a calibration regime.

1.3 Sub Tier Suppliers

The supplier shall ensure that sub tier suppliers are compliant and comply with this document.

1.4 Implementation

These policies and requirements form part of the contract to supply *tooling*/equipment for LUK. The requirements of this document shall be deemed to be accepted and complied with by the Supplier where the Contract invokes its implementation. Acceptance and conformance is instigated by the supplier signing and returning the contract (Purchase Order) acknowledgement copy, to Leonardo Ltd Procurement, acknowledging via the Supply-On portal, or after 14 days contract is deemed accepted through auto acknowledgement.

2. PURPOSE

2.1 The purpose of this document is to ensure that:

2.1.1 A common policy for *tooling* is adopted by all suppliers who will produce/procure *tooling* to manufacture and produce components.

2.1.2 Compliant products can be produced to a conforming and repeatable standard from *tooling* being provisioned by the supplier and/or *tooling* supplied for the contract.

2.1.3 The standard of the *tooling* meets the specification for achieving the contract dependent upon contractual quantities/schedules as qualified by the following sections, where relevant:

- (i) Volume manufacture (Part One)
- (ii) Low volume manufacture (Part Two)

(ii) Appendices (Part Three)

- 2.1.4 Ownership of the *tooling*, records, maintenance, identification, storage and control is defined and complied with.

3. DEFINITIONS

LUK	Leonardo UK Ltd, Yeovil, Somerset, BA20 2YB
Tooling	Any Jig, Fixture, Template, Gauge, Master, Rig, Test Equipment or Validation Equipment including mechanical test and alignment, hydraulic, electrical, fuel or pneumatic equipment or part thereof.
CATIA	Computer Aided Three dimensional Interactive Application
CAD	Computer Aided Design
Material	Unique number given to each tool, can be found on <i>tooling</i> PO, material numbers for Master Number <i>tooling</i> start with 'TOOL'.

4. GENERAL REQUIREMENTS

- 4.1 *Tooling* provisioned by the Contractor for use to discharge the product contract shall achieve conforming products to their respective specifications as follows:
- 4.1.1 All *tooling* shall be of a quality, accuracy and durability to allow manufacture of the required quantity of parts and assemblies to the specified production rate as identified by the contract.
 - 4.1.2 Production *tooling* should be designed to be sufficiently robust and rigid in construction to avoid distortion and maintain dimensional stability and be compatible with the manufacturing processes to which the *tooling* will be subjected.
 - 4.1.3 All *tooling* or equipment including duplicates, shall be designed and/or specified to achieve an output of a minimum of 2.5 Aircraft sets of components per calendar month, unless otherwise contracted. The *tooling*/equipment shall also be required to have a minimum life of 250 Aircraft sets. Where some types of *tooling*/equipment by virtue of the process or activity cannot sustain this level, then the quantities and costs shall be identified by the supplier and agreed by LUK prior to *tooling* order placement.
 - 4.1.4 The accuracy and repeatability of the *tooling* shall achieve the Engineering and contract requirements along with the ability to meet Interchangeability requirements where specified. A re-calibration programme for re-certification of *tooling* controlling interchangeable features shall be established and maintained and records of the calibration shall be held for three years.
 - 4.1.5 It is preferred that the Supplier shall use a LUK CT approved *Tooling* manufacturer

where *tooling* is to be sub contracted for manufacture. The Supplier may request Central *Tooling* to approve a *Tooling* Supplier of their choice where a specific process is required that is not covered by existing Approved *Tooling* Companies. The Supplier may also request Approval of a *tooling* manufacturer where they are the Suppliers preferred option, by submitting Company data / approvals / accreditations. This would be reviewed and accepted/rejected by Central *Tooling*. Approved *Tooling* Manufacturer Matrix is available on request.

4.2 *Tooling* supplied as free issue shall be appraised as follows:

4.2.1 The receiving Contractor shall be responsible to make sure the *tooling* is compatible to the process and produces correct components to the Engineering Design or specification. The *tooling* shall be appraised for conformance to paragraph 3.1 and where non-conforming, then the Contractor shall have recourse in writing to LUK to adjudicate and agree the acceptance criteria.

5. COMMERCIAL REQUIREMENTS

5.1 The supplier shall identify to LUK, the *tooling* necessary to discharge the Aircraft Component manufacturing requirements as a Tool Quotation.

Note: The supplier is not to include Engineering NRC costs within *Tooling* quotations. This is to be covered by the associated component order.

Below are the requirements for all *Tooling* Quotations:

- Quotations must be on company headed paper,
- Quotations must have a reference number and be dated,
- Quotations must be signed by a representative of the company,
- The LUK part number for each tool must be identified,
- The LUK tool number and description of each tool must be identified,
- Individual costs for manufacture of each tool must be quoted,
- Individual lead time for manufacture of each tool must be quoted,
- Individual design cost and lead time for each tool if applicable,
- Quotations must include if tool is New, or a Modification / Refurb to existing tool

5.2 Central *Tooling* reserve the right to request a competitive Tender for all *tooling* required to support the contract.

5.3 For a contract which may have an extended duration to completion, the supplier may request that any subsequent *Tooling* Order raised to perform the work should be prepared with several line items to reflect the various activities but must have tangible verifiable milestones. The supplier can then invoice progressively for each line item as the contract is discharged.

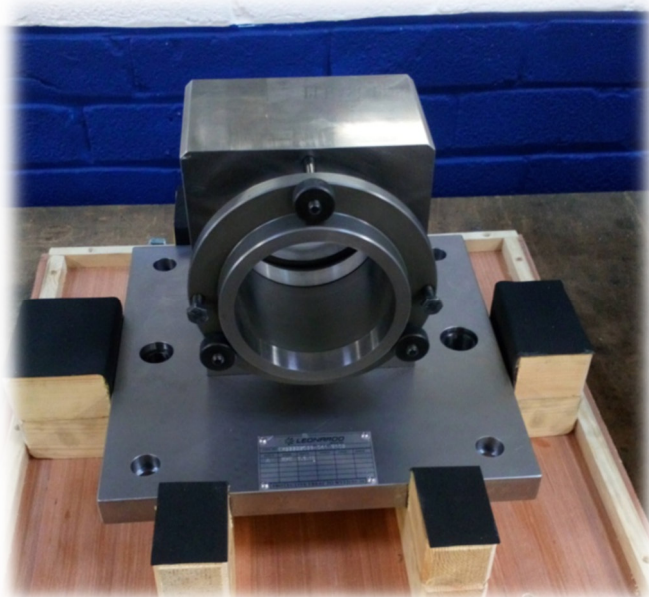
5.4 Upon acceptance of the supply of any *tooling* or equipment from LUK, the supplier shall review and confirm its compliance for suitability, conformance and condition and will be responsible

for the quality of parts produced from such *tooling*/equipment.

- 5.5 The supplier will be responsible for maintenance, refurbishment, calibration, storage and reconditioning of the *tooling*, at no additional cost to LUK.
- 5.6 LUK reserves the right to carry out audits and progress status checks at the supplier's premises on all *tooling*/equipment and gauges provisioned under the contract. (see Section 20 - Audits) LUK shall give fourteen (14) days notice to the supplier prior to an audit.
- 5.7 It may be necessary for suppliers to report at agreed intervals achievement against an agreed programme. This should be in the form of a Microsoft Project Plan. For milestone payments evidence of achievement (C of C, and in some cases audit) will be required.
- 5.8 On completion of the *tooling* contract, milestone activity or line item, a Certificate of Conformity (C of C) or Purchase Order Compliance Certificate shall be raised and accompanied (unless otherwise stated on the individual item text on the purchase order) with a digital photograph of each tool. These shall be supplied via email to central_tooling@leonardo.com. Each photo should be in a PDF format and be identified with the relevant LUK Part No./Tool No. (eg WG1593-0328-041 W105.pdf). This will form part of the C of C process. The photo must show the overall tool, and must clearly show the permanent part marking on the *tooling* manufactured, in accordance with the *tooling* purchase order short text.



Where the Part No/Tool No. on the overall image is unclear, a second image shall be supplied of the permanent part marking.



- 5.9 The Certificate of Conformity or Purchase Order Compliance Certificate on company headed paper shall contain :-
- The Purchase Order Number
 - The Purchase Order line item number
 - The LUK Part Number
 - The LUK Tool Number
 - The Material Master Number
 - A statement to certify that all requirements of the Contract (Tooling Purchase Order) and this Document are complied with
 - Relevant authorised signature
- 5.10 Upon receipt of the Certificate of Conformity and relevant *tooling* photograph, payment will be authorised (subject to audit or other evidence as may be required) where upon ownership title of the *tooling* shall pass to LUK.
- 5.11 Where tool designs have been created, a Design CofC/Purchase Order Compliance Certificate, as per section 5.9, shall be provided. Design files must also be supplied via Leonardo PDCE, FAO Joshua Frankpitt or Ellie England. Contact PDCE@leonardo.com for further assistance on PDCE process.

6. LIAISON

- 6.1 The supplier will liaise with LUK CT Department personnel prior to the commencement of a tool design/procurement programme, to confirm the requirements for interchangeability control

and to ensure maximum compatibility between *LUK* and suppliers of tool design and manufacturing standards is achieved.

- 6.2 Advice may be sought/provided as appropriate of *LUK* approved *tooling* suppliers where this may assist with compliance to *LUK* procedures and processes.

7. RECORDS

- 7.1 The supplier shall maintain a separate electronic register on a PC database flat file, e.g. Microsoft Excel, of all tools, jigs, fixtures, gauges, rigs, etc. provided/procured for the production of parts to which the contract relates including all sub tier suppliers who may retain *tooling*.
- 7.2 This register shall include particulars of any additions or alterations made to the jigs, tools etc. after the initial provision.
- 7.3 Such registers shall clearly show that *tooling* listed in the register and associated *tooling* designs are owned by *LUK* and are held at the disposal of *LUK* including *tooling* funded through amortisation. The register must also include *tooling* which are specific to *LUK* contracts and are required to manufacture *LUK* components but have been funded by the supplier.
- 7.4 The supplier shall not transfer any jig, tools, etc. without *LUK* written permission and any such transfer must be properly recorded. Where *tooling* is required for transfer by *LUK* this must be co-ordinated through *LUK* CT Department.
- 7.5 Records of *tooling* despatch documentation, and *tooling* receipt (free issue) documentation must be held and maintained by the supplier.
- 7.6 It is mandatory for the register to record:
- a) *LUK* Part Number / Tool Number e.g. WG1412-1234-041 / W95
 - b) Issue Status (to relate to Product identity or revision)
 - c) Product Description
 - d) Tool Location (including sub-tier locations)
 - e) Ownership (*LUK* or Supplier owned)
 - f) *LUK* Tooling Purchase Order Number
- 7.7 It is desirable for the register to record:
- g) Date of Manufacture
 - h) Value
- 7.8 The supplier shall, within 28 days of the request by *LUK*, supply an electronic copy of the register of the *tooling*/equipment.

8. MAINTENANCE

- 8.1 All *tooling* produced, supplied or managed in compliance of this document shall be maintained

in accordance with this document until such time as *LUK* request their return or issue disposal instructions. This shall include appropriate control, insurance and maintenance as required to keep the *tooling* in a production readiness state.

- 8.2 All original *tooling* drawings held by the supplier, including those supplied by *LUK*, shall be maintained by the supplier at their cost, in good condition and kept up to date.
- 8.3 *Tooling* shall be used by the supplier only in connection with the contract for *LUK*'s purpose only.
- 8.4 The supplier shall indemnify *LUK* against any loss of or damage to any such *tooling* which occurs, during the period commencing from the time when the supplier takes possession of the *tooling* and ending when the *tooling* is being returned to the destination specified by *LUK*.

9. **DISPOSAL**

- 9.1 The supplier is not permitted by any means to dispose of any *LUK* owned *tooling*, tool designs or specifications in their possession without prior written authority from Central *Tooling*, *LUK*.

10. **TOOL RETURNS**

- 10.1 Where request are made for *LUK* Jigs, Tools and Test equipment to be returned back to *LUK* Yeovil which had originally been procured against an *LUK Tooling* contract then it is the suppliers responsibility to return the requested *tooling* asset at zero cost to *LUK*.
- 10.2 Where *tooling* has been supplied direct from *LUK* to the supplier free issue, then it is *LUK* responsibility to cover the transport cost for return.
- 10.3 All tooling requests must be responded to within 10 working days of the return request.
- 10.4 Where tooling is no longer required for contract and it is desired to be returned to *LUK* by the vendor, a return request must be made to *LUK* Central Tooling to ensure able to facilitate at that time.
- 10.5 All *LUK* Tool returns in all instances must be accompanied with the appropriate returns paperwork and must clearly list each individual *LUK* Part /Tool Number of each tool being returned.

Delivery address for all *LUK Tooling* to be returned is:

Leonardo Helicopter (UK) Division
Jig & Tool Receiving Wharf
Building 200
Lysander road
Yeovil
Somerset
BA20 2YB

11. TOOL DESIGN

- 11.1 Unless *tooling* is being procured against a *tooling* standard or specification, the supplier should provide a *tooling* design on *CAD*, *CATIA*, conventional drawing or sketch. *Tooling* such as main assembly/sub assembly fixtures, interchangeability media, acceptance/checking gauges and test/ validation equipment should all have a *tooling* design. These *tooling* designs, whether conventional, *CATIA* or *CAD*, must normally be produced on *LUK* format. *CATIA* V4 & *CATIA* V5 Leonardo standard Draw Formats are available on request.
- 11.2 Where tool designs have been created, design files must also be supplied via Leonardo PDCE, FAO Joshua Frankpitt or Ellie England. Contact PDCE@leonardo.com for further assistance on PDCE process.
- 11.3 The supplier's *Tooling* Design format requires prior written approval by *LUK*. In such cases the design shall always be clearly identified as owned by *LUK*.

12. TOOLING PHILOSOPHY

- 12.1 This section sets out the main criteria to be implemented when producing *tooling*. Specialist *tooling* may require specific conditions.

All *tooling* shall conform in principal with the Central *Tooling* Standards Manual CT0591 Volume 2 to a production standard (see Section 4).

12.2 Assembly Fixture

Major assembly fixtures are defined as those used for the assembly of other sub-assemblies and parts. They are considered to be jigs, which would generally be sited and attached to the floor.

Jig structure shall be of welded construction, using hollow steel box section, with pads at positions of attachments.

Jig structure shall be of robust and rigid construction to avoid distortion for dimensional stability.

The utilisation and maximum use of standard materials sections, aluminium *tooling* plate and standard jig parts (bushes, pins, clamps, etc.) being considered wherever practical.

Jigs shall be constructed around predetermined datum points and/or surfaces, with full utilisation of optical alignment equipment and interchangeability media.

Tooling in this category producing interchangeable products will be subject to periodic inspection/calibration and must be in compliance with an agreed schedule (annual

recommended) in accordance with ISO 9001.

12.3 Sub Assembly Tooling

Sub-assembly tools are defined as tools used for the assembly of a number of several detail parts, and are to be designed and to give repeatability of product to required tolerances.

The manufacturing criteria shall be the same as for Assembly Fixtures.

Nominated *tooling* in this category producing interchangeable products will be subject to periodic inspection/calibration, and must be in compliance with an agreed schedule (annual recommended) in accordance with ISO 9001.

12.4 Detail Tooling

12.4.1 Detail Tooling (Sheetmetal)

All detail tools are to be manufactured to a production standard, capability and durability. It is not expected that designs will be required for all tools as it is anticipated that a proportion of *tooling* will be made direct from component/full scale layout information or *CAD/CATIA* geometry.

12.4.2 Detail Tooling (Machining)

Where suitable, N.C. machines should be used with holding fixtures being considered to hold and locate the material. Where more than 1 spindle is used, separate fixtures shall be provided for each spindle.

12.4.3 Cutting Tools/Gauges

The supplier shall be responsible for the supply, procurement, maintenance and inspection of all gauges, standard tools and consumable tools at his expense.

(a) Standard

Standard cutting tools/gauges shall be procured and maintained by the supplier at his own expense.

(b) Special

Cutting tools/gauges are those which include features controlled by component drawing requirements, e.g. taper, profile, etc., but not corner radii which may readily be added to a standard tool. These may form part of the schedule of *tooling* but maintenance and replacement costs shall be at the supplier's expense.

12.5 Composite Tooling

12.5.1 Master Models/Splashes

LUK shall be responsible for the manufacture and supply of all master models/splashes, which control interchangeable features unless otherwise specified.

Such master models and splashes will generally provide shape, cut-lines and hole positions, and will be fully certified by *LUK*.

The supplier will be responsible for the quality of tools and resultant product produced from the media supplied by *LUK*.

Tooling in this category will be subject to periodic inspection/calibration by *LUK* unless otherwise specified in accordance with ISO 9001.

12.5.2 Moulds

For the construction of moulds, the material selection (glass, kevlar, carbon-fibre, metallic), utilisation and lay-up procedures with costs, durability and production quantities shall be the prime considerations.

Where components require to be produced from *tooling* in an Autoclave process then the *tooling* must hold a vacuum or allow for complete bagging.

Material selection must consider expansion/contraction characteristics of the component to be produced to ensure dimensional accuracy is achieved, within the appropriate environmental conditions.

For composite mould tools the lay-up procedure must place emphasis on ply orientation laminate consolidation with the achievement of a rigid structure (shape retention).

Nominated *tooling* in this category producing interchangeable products will be subject to periodic inspection/calibration and must be in compliance with an agreed schedule (annual recommended) in accordance with ISO 9001.

12.5.3 Drill and Trim/Rout Facility

Material utilisation for this type of facility will be greatly influenced by shape, size and complexity of component part.

For glass reinforced plastic (g.r.p.) *tooling*, a proven *tooling* resin system must be employed for the purpose of maintaining dimensional stability. *Tooling* location/lugs, matched across the *tooling* suite, must be a prime consideration in all cases.

Nominated *tooling* in this category producing interchangeable products will be subject

to periodic inspection/calibration and must be in compliance with an agreed schedule (annual recommended) in accordance with ISO 9001.

13. INTERCHANGEABILITY (ICY)

13.1 General Requirement

Generally, full interchangeability (ICY) is a requirement for any component or assembly, which is recognised as a spare or replacement item. Full ICY is only achieved when geometric and functional requirements are met. Geometric ICY is achieved when an item is designed and produced in such a way that it can be readily exchanged for another item without the need for select fit. Functional ICY is achieved when operational or performance characteristics are maintained on interchange.

Interchangeability control media shall be stored/transported in dedicated transport cases. *Tooling* either provided or made by the component supplier which controls interchangeable features shall be inspected/calibrated by the supplier (annual recommended) in accordance with ISO 9001 unless otherwise instructed.

13.2 Categorisation

Interchangeable items fall into two categories:-

13.2.1 Interchangeable

Those items which are designed to be changed during the life of an aircraft, i.e. gearboxes, engines, rotor blades, fairings etc.

13.2.2 Manufacturing Interchangeability

Those items not intended to be changed during the life of an aircraft, but for reasons of assembly/production or cost are manufactured to an interchangeable standard i.e. shelves, customer kits, panels etc.

13.3 Philosophy

The *LUK* philosophy for producing an interchangeable item is to manufacture a set of tools for the item and its counterpart structure/interface. This set of tools must be to a standard that when the components are produced, a satisfactory assembly within the specified tolerances will be obtained.

Dependent upon the component/assembly tolerances, configuration and installation accuracy then the method of manufacture and compatibility of the set of tools can be achieved by any one of the following methods:-

a) Co-ordinates/dimensions.

Normally used when components are fully machined or when a generous manufacturing tolerance has been specified and the tools can be measured for

conformance.

- b) Physical application of the production tools to each other. Normally used when each tool can be easily applied to the other and the component has the same manufacturing source.
- c) Interchangeability Media.
Normally used when the component is of a complex construction and cannot be easily checked by ordinates, also used at major interfaces for ease of manufacture and certification of assembly *tooling*.

13.4 Media Identification

13.4.1 Control Master Gauge

A control master gauge is used for the co-ordination and inspection of the master-*tooling* gauge.

Only one control master gauge can exist and it shall be produced by LUK.

In general it has a limited requirement, but it is essential when it is necessary to provision more than one master *tooling* gauge.

13.4.2 Master Tooling Gauge

A master-*tooling* gauge is used for the adjustment, co-ordination, inspection and re-certification of production *tooling* and checking gauges. It simulates the interchangeable features of a specific component. A Master *Tooling* Gauge will be provisioned by LUK.

It is generally set to dimensions and co-ordinated to the master *tooling* gauge for its mating part.

When multiple master *tooling* gauges are provisioned, due to multiple sources of supply, these gauges will be set and co-ordinated to a control master gauge.

13.4.3 Checking Gauge

A checking gauge is an inspection facility to enable the final checking of any item to be effected efficiently and economically to a common standard, ensuring that all interchangeability features within a component are checked in relation to each other.

Checking gauges, however, will only serve to confirm the standard of component when all operations are complete and therefore should only be used when essential.

The supplier shall ensure that adequate jig control is exercised during the manufacture

of the component and eliminate the need for rework after erroneous operations.

13.4.4 Master Component

Master components may be provisioned as a facility for establishing/confirming a standard to modular equipping and final line build, e.g. master pipes, cowls and LRU equipment. Master components representing role equipment may be required to enable the proving out of structural fixed fittings, ensuring an interchangeable fit of role equipment.

13.5 Responsibilities

The supplier will ensure that manufacturing methods/procedures, processes are documented to make sure *tooling* is used correctly/in the appropriate sequence to achieve consistent production.

Design, manufacture and supply of interchangeability control media, will normally be determined and provided by LUK. Where the supplier makes both part and counter-part, the supplier may produce interchangeability media with the agreement of LUK.

All interchangeability control media is subject to periodic inspection that must be in accordance with ISO 9001 with a programme and records to substantiate calibration. These records shall be held for a period of 3 years. See paragraph 16.

When requested the supplier will provide LUK with identities of *tooling* provisioned to control interchangeable features in both part/counterpart components.

14. TOOL STORAGE

- 14.1 The supplier is responsible for providing an appropriate storage environment (dry, covered) for *tooling*, including when not in use, at his own expense for all *tooling* under the contract that is in his possession. Refer to the Central *Tooling* Manual CT0591 Volume 2 Section 3.08 for Storage requirements.
- 14.2 When not in use, all *tooling* shall be recorded and stored on racking, shelves, pallets, storage bins or a nominated area. Tools must not be stacked upon one another.
- 14.3 No *tooling* shall be stored externally.
- 14.4 Where the supplier produces Master Media, including Patterns and Models, then enclosed wooden boxes shall be provided by the supplier for all such media and shall be manufactured in compliance with Central *Tooling* Manual CT0591 Volume 2 Section 3.08.

15. PROTECTION

- 15.1 The supplier shall ensure that all *tooling*, equipment and interchangeability media, provisioned and under this contract, is protected against corrosion or degradation in accordance with Central *Tooling* Manual CT0591 Volume 2 Section 3.10.

16. TOOL IDENTIFICATION

- 16.1 In all instances where it is viable, an Ident Plate (*see fig 3*) shall be applied to the tool.

When required, a Re-Certification Plate (*see fig 4*) shall be applied to the tool (in addition to the ident plate).

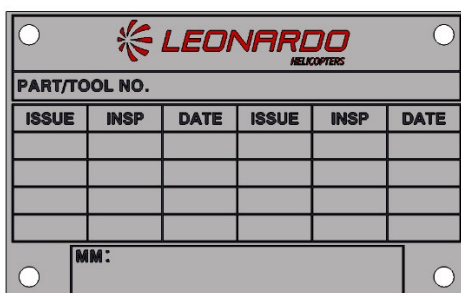
Ident and Re-Certification Plates shall either be screwed or riveted to the tool as deemed applicable, on non-working faces in a clearly visible and easily accessible location.

Ident plates shall be stamped, CNC Engraved or Laser Etched at the supplier's discretion with the part and tool number from the Purchase Order, *material master number* from the Purchase Order, issue of tool, inspection stamp, and date in the applicable positions of the ident plate.

Ident plates must be updated with the issue of the tool, inspection stamp, and date, when a tool is modified.

If a re-certification plate is required (in addition to the ident plate), the tool number and WAW number(which can be obtained on request from Central *Tooling* if not stated in the Purchase Order) should also be stamped, CNC Engraved or Laser Etched at the supplier's discretion, in the applicable positions of the re-certification plate.

The Supplier or third party's recorded inspection/acceptance mark shall be applied to the plate on approval of the tool.

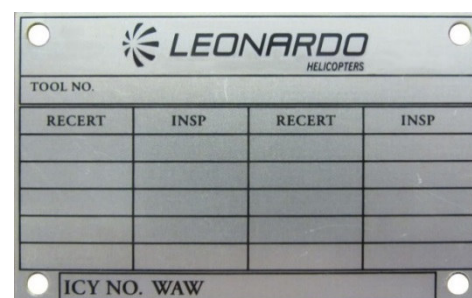


Ident Plate Template (Fig 3) showing fields for PART/TOOL NO., ISSUE, INSP, DATE, and MM.

PART/TOOL NO.					
ISSUE	INSP	DATE	ISSUE	INSP	DATE

MM:

Fig 3



Re-Certification Plate Template (Fig 4) showing fields for TOOL NO., RECERT, INSP, and ICY NO. WAW.

TOOL NO.			
RECERT	INSP	RECERT	INSP

ICY NO. WAW

Fig 4

In instances where it is not viable to attach Labels to the tool due to insufficient size, material or shape, then the Tool shall be marked with the part and tool number, and *material master number*, as per the PO, with an inspection stamp adjacent and if applicable the WAW number, by one of the following methods:

- CNC Engraving
- Laser Etching
- Stamping
- Cable Identification Sleeves

Where a storage box is required; an Ident Plate, and Re-certification Plate (if applicable), shall also be either screwed or riveted to the box.

Note: attaching an ident plate to the storage box, should only be carried out in addition to, and not in lieu of physical tool identification.

- 16.2 The manufacturer may permanently attach the manufacturing Company's official label to the tool, or if this is not possible due to size or shape, the Company's name may be permanently marked, stamped, engraved or etched in a prominent and non-wearing position upon the tool.

17. TOOL VALIDATION, CALIBRATION & RE-CERTIFICATION

- 17.1 The supplier shall undertake the periodic re-calibration for any *tooling* or gauge which establishes, controls or verifies interchangeable features or interface airframe joints at regular intervals every 12 months or designated Aircraft sets as defined and agreed with LUK.

- a. Validation, calibration, re-certification of Master *Tooling* Gauges, Models and Standards supplied by LUK will be controlled by LUK.

18. PERFORMANCE MONITORING

18.1 Performance

The supplier will be responsible for the provisioning of appropriate *tooling* unless otherwise stated, for achievement of the contract and programme milestones agreed and contained within the terms of the contract and to create and monitor the *tooling* schedule/plan to meet the Product delivery schedule.

Where monthly progress reports are required (identified on Purchase Order) they shall be submitted in the form of a Microsoft Project Plan to the Engineer via e-mail.

The supplier shall be responsible to determine the number of tool designs and *tooling* and create the appropriate plan against which performance shall be measured.

The scope of performance monitoring will depend upon the size of each individual contract and will be determined prior to contract award.

18.2 Conformance

LUK shall conduct a *tooling* audit/review, either against the *Tooling* purchase order or the Suppliers Management, Control and Processes to ensure compliance with this document. A pro forma of the checklist is included (see CT0399) for information. The results of the audit will be presented as a Questionnaire and Record document.

18.3 First Article Inspection (F.A.I.)

In conjunction with LUK Supplier Quality Department the Central *Tooling* Department may support the F.A.I. process to ensure adequate *tooling* and control features have been provisioned along with supporting evidence of inspection and calibration.

Where LUK has devolved re-certification responsibility to the supplier, the supplier shall have a system to record *tooling* which requires to be re-calibrated on a regular frequency and to undertake the re-certification and maintain records.

18.4 Orderbook Management

The Supplier is responsible and required when requested, to report on the current status of each *tooling* order placed on them.

As required, the Supplier is to report and identify that each *tooling* line item is on schedule to meet the contracted completion date, in line with the purchase order requirements. The frequency for the Supplier submitting this information will be at the discretion of LUK Central *Tooling* department.

Where there are delays to the contracted completion dates for *tooling* purchase order line items, the Supplier is required to report this as soon as known and before the contracted dates has passed, with reasons for the delay and identification of a revised forecast date. This would then be reviewed and the contract dates realigned where possible.

Upon completion of each *tooling* purchase order line item, the Supplier is to submit the required supporting documentation to enable payment to be authorised, see commercial requirements in Section 5.

19. PURCHASE ORDER TERMS & CONDITIONS

19.1 Tool Design & Specification

19.1.1 Tool Design Clause

The design of *tooling* produced in compliance of a contract shall be in accordance with the principles contained in the *LUK Central Tooling Manual CT0591 Volume 2*.

19.1.2 Intellectual Property Clause

The property in the design of *tooling* covered by a contract (hereinafter called 'the said Design') shall, subject to the rights of any owner in any invention or design incorporated or used in the said Design, belong to *LUK* and or *LUK's* customer.

19.2 Tooling/Equipment Manufacture/Supply

19.2.1 Manufacture Clause

The manufacture or supply of any *tooling* or equipment or repair/refurbishment covered by a contract shall be in accordance with the requirements contained in the *LUK Central Tooling Manual CT0591 Volume 2*. Where *tooling* and equipment is procured through a sub-tier manufacturer or supplier then that contractor or supplier shall be a *LUK Central tooling* approved *tooling* company or supplier.

19.2.2 Tooling Manufacturing Clause

The *tooling* manufactured in accordance with the contract shall be deemed to have been accepted following receipt and acceptance by *LUK* of a signed and detailed Certificate of Conformity/Purchase Order Compliance Certificate.

However, any product or tool upon usage, found to be incorrect to specified requirements, shall be corrected at the supplier's expense, even if the time lapse between usage and delivery is such that payment has already been made. In the case of 'non-design *tooling*', if it is proved the tool is not to the information supplied for manufacture, the supplier will be requested to take corrective action at the supplier's expense.

The *tooling* shall remain the sole property of *LUK* and or *LUK's* customers and shall be so marked in accordance with the *Tooling Purchase Order*. In addition, the *tooling* shall be stamped or otherwise permanently marked, and the *tooling* shall be recorded in a tool register in a form acceptable to *LUK*, the register and the *tooling* shall be made available for inspection by *LUK* upon giving reasonable notice.

The *tooling* shall be maintained in good and serviceable condition and shall not be used for any third party contract without the prior written consent of *LUK* and *LUK* shall be entitled to payment for such use at a rate determined when the written consent to use the tool is given.

On receipt of instructions from *LUK* the *tooling* shall be delivered to *LUK Yeovil*, or to such other location as shall be notified in the instructions at no cost to *LUK* other than

fair and reasonable costs for packing and carriage.

19.2.3 Intellectual Property Clause

No *tooling* shall be manufactured to the design or created from specifications/requirement documents, nor any license granted to manufacture *tooling* to the design, for or to any person or company, other than *LUK*, without the prior agreement of *LUK* who shall be entitled to charge such sums as should be reasonably paid for the use of the said design and require a full indemnity from any party wishing to use said design.

19.3 Inspection of Equipment, Products or Work

19.3.1 Inspection Clauses

This *tooling* shall be deemed to have been accepted by *LUK* on the successful manufacture of the first component using the *tooling*.

Should the first component so manufactured be unacceptable to *LUK* by reason of faulty *tooling*, such fault being attributable to the supplier, *LUK* shall either:-

19.3.1.1 Require the supplier to modify, repair or replace at the supplier's option, the defective *tooling* or part thereof at no cost to *LUK*, or

19.3.1.2 Require the supplier to credit the cost of the *tooling* or part thereof together with the costs incurred by *LUK* in the dismantling and return of the rejected *tooling* or part, or

19.3.1.3 Repair, rework or otherwise correct the rejected *tooling* or part and charge the supplier with the cost thereof.

19.3.2 Inspection Clause

Each item of *tooling* produced against a contract must be new and unused and be subject to inspection for conformance with the tool design, specification and commercial/ contractual requirements for release by the supplier's inspection organisation. Evidence of this inspection and release shall be shown by the impression of the supplier's official inspection stamp.

19.3.3 Inspection Clause

Each suite of *tooling* produced against a contract must be subject to inspection and release by the supplier's inspection organisation with Certificates of Conformity and delivery/advice notes.

19.3.4 Calibration Clause

For *tooling* that requires calibration and periodic re-certification, where requested a 'Certificate of Conformity' stating Calibration carried out in accordance with Tool Design requirements shall be provided by the supplier.

19.3.5 Warranty Clause

The supplier warrants that the *tooling* delivered will be free from any defects in design, workmanship and material and that they will give proper services under the operating and design conditions as specified, for a period of 12 months calculated from the day on which the *tooling* is installed and commissioned.

The period of 12 months specified above shall be extended by any period(s), which the *tooling* after delivery is out of action as a result of any defect covered by this warranty.

In the event of defects covered by this warranty then *LUK* shall notify the supplier as soon as possible and the supplier shall without delay remedy repair or replace free of charge (cost of labour and transportation not excluded) the goods having such defects or authorised *LUK* to do so. In the latter event the supplier shall reimburse to *LUK* labour plus overheads and administrative costs.

LUK without prior approval may effect remedying and repairing by the supplier in cases where it would be unreasonable to demand that prior approval be obtained.

In such cases the supplier and *LUK* shall agree which party shall bear the costs and expenses thereof or in what proportion these costs and expenses shall be divided between them. This warranty shall remain in effect provided the remedying and repairing do not result in any detriment to the *tooling*. In no event will this warranty cover defects due to normal wear and tear, disregard by *LUK* of operating instruction, excessive overloading by *LUK* of operating conditions.

19.4 Packaging

19.4.1 Packaging Clause

It is the responsibility of the supplier, when requested, to deliver all *LUK* / Customer owned *tooling* assets to *LUK* at the suppliers cost. This includes *tooling* which has either been manufactured by the holding supplier including IS3 requirements or been free issued to the holding supplier. The return of *tooling* assets must be with appropriate and effective preservation, packaging and shipping, to *LUK* or designated destination. The shipment shall be marked in accordance with applicable specifications and/or purchase order requirements with appropriate documentation and records.

19.4.2 Packaging Clause

Tooling shall be adequately protected against corrosion, contamination and damage during shipment and handling. All fluid openings and connectors must be protected

against contamination and damage. Hydraulic or fuel component parts or openings shall be plugged or sealed with proper fitting closures that will not deteriorate in contact with these fluids. Only closures of metal material are acceptable for sealing hydraulic or fuel system component, but must be so designed as to prevent the fitting of these components without the removal of the closures.

Plastic closures are acceptable for non-fluid application such as electrical connectors.

19.4.3 Weight & Centre of Gravity Requirements

The weight of *tooling*, rig or equipment in excess of 15kg shall be suitably and prominently marked and where stored in an enclosed container shall also include the total weight value and an approximate Centre of Gravity position identified on the container for safe lifting or handling.

20. AUDITS

The scope of audits is to determine compliance and conformance with the contract order and this Terms and Conditions document (CT0101).

20.1 Supplier Tooling Control & Purchase Order Audit Document, CT0399

20.1.1 Section 1:

Section 1 of this audit document will be used when auditing component suppliers against specific *Tooling* Purchase Orders.

Frequency of audits shall be determined by the Central *Tooling* Department, dependent upon utilisation and/or total Purchase Order Value criteria.

This audit, when performed, will, upon a successful outcome sanction Invoice settlement.

20.1.2 Section 2:

Section 2 of this audit document will be used when auditing component suppliers that manufacture and or hold supplied, free issue *tooling*.

It may also be used in conjunction with section 1, if section 1 is unsuccessful and payment is to be withheld.

Frequency of auditing will be based on using a new component supplier identified by commercial department and thereafter annually or at the direction of Central *Tooling*.

Existing component suppliers which hold *tooling* for the use on LHUL parts, will be audited annually or at the direction of Central *Tooling* using this section of the

document.

20.2 Supplier Self Certification - CT0216

CT0216 is a Self Certification register issued at the discretion of Central *Tooling* to Suppliers holding *LUK tooling* inclusive of a SAP generated tool list for that Supplier's vendor code.

The Supplier shall evaluate the submitted list and to confirm compliance, sign and return the register.

Deviations to be advised to Central *Tooling* for corrective action.

PART TWO

ADDENDUM TO DOCUMENT FOR LOW VOLUME MANUFACTURE

(Shall be a specific contracted requirement when
this type of philosophy is required)

PART TWO

INTRODUCTION

Part Two of the *Tooling* Supplier Control Document CT0101 identifies the approach, when specifically contracted within the *Tooling* Purchase Order, to qualify the philosophy to be adopted to achieve a low volume production policy, commensurate with achieving an acceptable build standard whilst minimising *tooling* costs. Where a *Tooling* Purchase Order does not invoke this Part Two Section, then Part One shall always be the precedent.

Where sections are omitted then the relevant existing sections contained within Part One shall apply given that they do not conflict with Part Two.

SECTION 1 SCOPE & AUTHORITY

This document sets out the *tooling* philosophy and requirements to be adopted by suppliers provisioning *tooling* in the support of component packages being undertaken for low volume production of Aircraft parts, components and assemblies.

SECTION 2 PURPOSE

The purpose of Part Two is to ensure that where the method of production engineering of package details, sub assemblies, assemblies and installations has considered and eliminated free hand produced manufacturing techniques, then any *tooling* to be provisioned is to be to a 'diluted' standard.

Wherever possible and practical, the *tooling* should be capable of being economically upgraded to full production requirements should production rates dictate at a later period.

SECTION 3 TOOLING PHILOSOPHY

3.1 Assembly Fixtures

Where an existing fixture can be utilised by modification or by the provisioning of a new fixture, then the philosophy to be adopted shall be:-

a) **Modification to existing Tooling**

Additional jig features to be incorporated, but to a production standard.

b) **New Tooling**

Only the absolute minimum of features necessary to control the standard to be incorporated, but to a production standard.

3.2 Sub Assembly Tooling

Where an existing fixture can be utilised by modification or by the provisioning of a new fixture, then the philosophy to be adopted shall be:-

a) Modification to existing Tooling

Additional jig features to be incorporated, but to a full production standard. Where practical and cost effective, consideration may be given to use densified wood or similar approach as alternative to metal.

b) New Tooling

Only the absolute minimum of features necessary to control the standard to be incorporated, but to production standard. When practical and cost effective, consideration may be given to use densified wood or similar approach as alternative to metal.

3.3 Detail Tooling

3.3.1 Detail Tooling - Sheet Metal

Where *tooling* is essential to enable the manufacture of a detail part to be produced then the following philosophy shall be adopted:

- Templates to be light alloy (for marking out) and unbushed.
- Form Blocks - Utilise production solution materials but to be to a 'diluted' standard i.e.:

no over bend
no top plates
no intensifiers.

3.3.2 Detail Tooling (Machining)

Where suitable N.C. machines should be utilised which will minimise *tooling* requirements. Holding fixtures should be to a basic standard or consideration should be given to utilising *CATIA* or similar *tooling* techniques.

3.3.3 Cutting Tools/gauges

The supplier shall consider wherever practical the utilisation of standard cutters, form tools, drills etc. Where specials are required, they are to be kept to a minimum. Where gauging is necessary then these shall be kept to a minimum with consideration directed to co-ordinated measuring machine techniques.

3.4 Composite Tooling

3.4.3 Drill and Trim/rout Facility

Wherever practicable the drilling and routing of components shall employ either:

- No fixturing by utilising 'end of part lines' and hole centres by the transfer of this geometry from the mould tool and hand finishing the component.
- By utilising a 'splash' from the Master Model.
- A thin gauge bushless cage.

SECTION 4 INTERCHANGEABILITY PHILOSOPHY

The achievement of full interchangeability status for components produced by employing a diluted standard of *tooling* approach will be difficult to reconcile.

As the basic Airframe and Major interchangeable items may be already controlled with existing full production *tooling*, the instances where a conflicting circumstance will prevail should be minimal.

Product features that require controlling to enable compatibility with an interface or are features that are identified as interchangeable will determine the minimum controls necessary to be built into the *tooling*.

Where features or components are required to a standard at variance with a diluted *tooling* philosophy, then recourse to LUK Central *Tooling* Department for dispensation shall prevail.

PART THREE
APPENDICES TO PART ONE

APPENDIX 1 – CENTRAL TOOLING TOOL CODES

TOOL No.	TOOL DESCRIPTION – PROCESS DESCRIPTION
W1	PROFILE TEMPLATE
W2	DRILL AND ROUT TEMPLATE
W3	ROUT TEMPLATE
W4	DRILL AND ROUT TEMPLATE - FIXED HEAD ROUTER
W5	ROUT TEMPLATE - FIXED HEAD ROUTER
W6	SPINDLE FIXTURE
W7	SPINDLE FIXTURE - CANTED HEAD
W8	DRILL AND ROUT FIXTURE - HAND ROUT
W9	BAND SAW FIXTURE OR TEMPLATE
W10	ROUT FIXTURE – MACHINE ROUT
W11	MULTIPLE JOGGLE BLOCKS
W12	JOGGLE BLOCK
W13	PIERCE AND/OR BLANK TOOL - SMALL CUTTING OPERATIONS
W14	FORM TOOL – SMALL FORMING OPERATIONS
W15	CLAPPER BLANK TOOL
W16	BLANKING OR PIERCING TOOL – SMALL CUTTING OPERATIONS
W17	SPINNING FORMER
W18	HOT FORM STRETCH TOOL - HUFFORD
W19	CROPPING TOOL
W20	PIERCE AND/OR BLANK TOOL - POWER PRESS - LARGE CUTTING OPERATIONS
W21	FORM TOOL - POWER PRESS - LARGE FORMING OPERATIONS
W22	RUBBER BOLSTER PRESS TOOL
W23	MODEL – COMPOSITE MOULD MANUFACTURE
W24	STRETCH FORM TOOL - STRAIGHTENING M/C
W25	JAWS FOR STRAIGHTENING MACHINE
W26	STRETCH FORM TOOL – HUFFORD
W27	JAWS AND INSERTS FOR H.S.F.M.
W28	FARNHAM ROLL TEMPLATE
W29	HOT FORM RUBBER BOLSTER TOOL
W30	LOOM LAYOUT BOARD – PHOTOGRAPHIC METHOD
W31	METAL PIPE PAYOUT, CUT OFF AND ASSEMBLY BOARD
W32	HAND SWAGGING TOOL
W33	DIE - PIPE BENDING M/C
W34	DIE - HILLMORE PIPE BENDING M/C CI
W35	DIE - HILLMORE BENCH PIPE BENDING M/C K1-4
W36	BRAZING AND SILVER SOLDER FIXTURE
W37	SPECIAL HAND BEADING TOOL
W38	SPECIAL HAND BELLING TOOL
W39	PIPE BENDING MASTER TABLE
W40	CONTOUR ROLLS
W41	DRILL AND CUT-OFF JIG
W42	DRILL AND FILE TEMPLATE
W43	DRILL AND TRIM CAGE
W44	MARKING-OFF TEMPLATE
W45	DRILL, BANDSAW, NIBBLE AND FILE TEMPLATE
W46	ENGRAVING TEMPLATE
W47	FLAME CUTTING TEMPLATE
W48	BENCH BEND BLOCK
W49	EDWARDS FOLDER SETTING PLATE AND MARKHAM FOLDER LOCATION PLATE
W50	MARKHAM FOLDER SPECIAL EQUIPMENT
W51	HEEL LINE TEMPLATE

TOOL No.	TOOL DESCRIPTION – PROCESS DESCRIPTION
W52	JIG AND TOOL LOFT TEMPLATE
W53	PULLMAN TOOL
W54	PULLMAN EQUIPMENT
W55	WELDING FIXTURE
W56	SPOT WELD FIXTURE
W57	BONDING FIXTURES - FOR HONEYCOMB PANELS
W58	BALANCING EQUIPMENT
W59	HEAT TREATMENT FIXTURE
W60	TREATMENT FIXTURE - SURFACE FINISH/PLATING
W61	GEAR SHAPING FIXTURE OR MANDREL
W62	GEAR CUTTER
W63	CHUCK JAWS - LATHES AND CYLINDRICAL GRINDERS
W64	DRILL OR DRILL AND REAM JIG OR PLATE
W65	PANTOGRAPH DRILL PLATE
W66	SPECIAL DRILL OR REAMER
W67	SPECIAL COUNTER - BORE, COUNTER-SINK OR SPOTFACE CUTTER
W68	SPECIAL TAP
W69	SPECIAL DIE
W70	MILLING FIXTURE - HORIZONTAL AND VERTICAL
W71	SPECIAL MILLING CUTTER
W72	MILLING MANDREL
W73	PROFILE MILLING FIXTURE - HYDRO-TEL, RIGID OR BRIDGEPORT
W74	PROFILE MILLING TEMPLATE - HYDRO-TEL, RIGID OR BRIDGEPORT
W75	PROFILE MILLING FIXTURE AND TEMPLATE – ASQUITH
W76	PROFILE TEMPLATE - TURNING/GRINDING/MILLING
W77	TURNING OR BORING FIXTURE – LATHE
W78	JIG BORING FIXTURE - JIG HORIZONTAL AND VERTICAL BORDER
W79	TURNING ADAPTOR, MANDREL
W80	TURNING MANDREL
W81	FORM TOOL - LATHE OR BORER
W82	BORING BAR
W83	BROACHING FIXTURE
W84	BROACH
W85	SLOTING FIXTURE
W86	GRINDING FIXTURE - ROTARY AND SURFACE
W87	GRINDING MANDREL
W88	HONING FIXTURE
W89	PROFILE TRACK PLANE MILL AND FIXTURE
W90	VICE JAWS – MACHINE
W91	HAND GAUGE – INSPECTION
W92	JIG BORING FIXTURE - NEWALL AND SPACEMATIC
W93	SPECIAL PURPOSE MACHINE
W94	MAIN ASSEMBLY FIXTURE - TO COMPLETE MAJOR AIRCRAFT ASSEMBLIES
W95	SUB-ASSEMBLY JIG OR FIXTURE - TO COMPLETE MINOR AIRCRAFT ASSEMBLIES
W96	CHECKING JIG
W97	REFERENCE PLATE
W98	MECHANICAL TEST RIG – TRANSMISSION
W99	TRANSPORT TROLLEY
W100	HOLDING FIXTURE – CONTOURMATIC
W101	ACCEPTANCE GAUGE
W102	TOOL/TEMPLATE SET UP
W103	MOCK UP
W104	SKINNING HORSE

TOOL No.	TOOL DESCRIPTION – PROCESS DESCRIPTION
W105	MOULD TOOL - COMPOSITES MANUFACTURE,
W106	INCIDENCE BOARD
W107	STENCILS
W108	MISCELLANEOUS (TO BE APPROVED BY THE P.E. - TOOL DESIGN)
W109	HOLDING FIXTURE - N.C. M/C
W110	VERO DRILL FIXTURE
W111	MOULD LOFT LOOM LAYOUT
W112	PATTERN TEMPLATE FOR WOVEN COMPOSITE CLOTH
W113	HOLDING FIXTURE FOR FERRANTI OR GZIP CHECKING MACHINE
W114	FIXTURE FOR SHRINKING IN LINERS
W115	MANDREL FOR W114
W116	TRANSPORT BOXES
W117	SCRIBING TEMPLATE - CHEMICAL ETCHING
W118	HORIZONTAL BORING FIXTURE - COLLECT AND ENGLEHARD
W119	PROFILE TEMPLATE – HYPOWERMATIC
W120	PROFILE FIXTURE – HYPOWERMATIC
W121	HOLDING FIXTURE - DEEP HOLE/GUN DRILLING MACHINE
W122	MILLING FIXTURE - DROOP AND REIN PROFILE MILL
W123	SPLIT BUSH
W124	MILLING BLOCK
W125	HOLDING FIXTURE
W126	FILM CUTTING TEMPLATE
W127	SANDWICH JIG – HONEYCOMB
W128	CORING TOOL – HONEYCOMB
W129	INSERT SETTING TEMPLATE – HONEYCOMB
W130	DISCONTINUED. ROTOBOR CUTTER
W131	DISCONTINUED. CORING TEMPLATE HONEYCOMB
W132	DISCONTINUED. USE W44. PRIMER MASK TEMPLATE
W133	HONEYCOMB CRUSH ROLLER
W134	N.C. TAPE
W135	N.C. TAPE/DATA -(FORMAT NOT KNOWN I.E. S/CON)
W136	DISCONTINUED. USE W134. N.C. DRILLING MACHINE TAPE
W137	HOBGING, SHAPING ARBOR
W138	DISCONTINUED. USE PA OR GB. GLEASON ARBOR, BUSH - GEAR CUTTING AND GRINDING ARBOR
W139	DISCONTINUED. USE GA. GLEASON REGISTER PLATES - GLEASON CUTTING AND GRINDING
W140	SPUR AND HELECAL FIXTURE
W141	SHOT PEENING FIXTURE
W142	ASSEMBLY AND DISMANTLING TOOLS FOR TRANSMISSION AND COMPOSITE DEPARTMENT
W143	DISCONTINUED. USE W151. ASSEMBLY AND DISMANTLING TOOLS FOR AIRCRAFT
W144	DISCONTINUED. USE W151. ASSEMBLY AND DISMANTLING TOOLS FOR HYDRAULICS
W145	ELECTRICAL TEST EQUIPMENT
W146	FUEL TEST EQUIPMENT
W147	HYDRAULIC TEST EQUIPMENT
W148	MECHANICAL TEST EQUIPMENT
W149	GUILLOTINE GAUGE STRIP WIDTH FOR PRESS TOOLS
W150	GEAR CHECKING FIXTURE
W151	GROUND HANDLING/LIFTING EQUIPMENT
W152	FIT OUT FIXTURE
W153	DISCONTINUED. USE W204

TOOL No.	TOOL DESCRIPTION – PROCESS DESCRIPTION
W154	DISCONTINUED, USE FP. GRINDING CAMS - MATRIX S.10
W155	DISCONTINUED, USE FP. DRESSER CAM – HOG LUND
W156	PROJECTION LAYOUT
W157	DISCONTINUED, USE IP OR IB. RED RING INDEX PLATES
W158	DISCONTINUED, USE IP OR IB. MATRIX INDEX PLATE
W159	DISCONTINUED, USE IP OR IB. ORCUT INDEX PLATE
W160	ALIGNMENT MEDIA
W161	APERTURE CONTROL FIXTURE
W162	TOOL FOR DROP HAMMER PRESS
W163	DISCONTINUED, USE W167. CROSSLAND TYPE PRESS TOOL - ALLOCATED FOR AEROSPATIALE
W164	CUTTING FORM TOOL - EDWARDS ROLLER PRESS
W165	TESTING FIXTURE - (FOR USE IN MATERIALS LAB)
W166	DISCONTINUED, USE W48. SQUEEZE FORM BLOCK – VICE
W167	STEEL RULE TYPE - FLYPRESS AND KNIFE TOOL – FLYPRESS
W168	RIVETING TOOL – SPECIAL
W169	BEARING OR BUSH ASSEMBLY TOOL
W170	INSPECTION AID – INSPECTION
W171	DISCONTINUED. HAND HELD ROUTING MACHINE – ROTOR BLADES
W172	NYLON PIPE LAYOUT, CUTOFF AND ASSEMBLY BOARD - PITOT STATIC
W173	DISCONTINUED, USE W172. HOT FORMED NYLON PIPE WITHOUT END FITTINGS, LAYOUT AND CUT OFF BOARD
W174	SPACE MODEL - DUMMY COMPONENT, MOCK UP, ETC.
W175	LOCATION TEMPLATE – WAL
W176	DISCONTINUED. PARALLEL BLOCKS (PATTERN PRESS)
W177	DISCONTINUED, USE W105. VACUUM FORMING BLOCK - NOMEX GLASS FIBRE HONEYCOMB
W178	VACUUM FORMING TOOL - VACUUM MOULDING
W179	DISCONTINUED, USE W44. FOAM CUTTING TEMPLATE
W180	TOOL TO CONSOLIDATE BY VACUUM PROCESS - COMPOSITE MANUFACTURE
W181	HOT DIMPLING TOOL
W182	INJECTION MOULDING TOOL - INJECTION MOULDING
W183	TOOL PROFILE CHECKING TEMPLATE - TOOL MANUFACTURE
W184	DISCONTINUED, USE W1. COMPONENT PROFILE CHECKING TEMPLATE
W185	DISCONTINUED, USE W211. HOT FORM TOOL - FOR TITANIUM
W186	HOLDING FIXTURE (FITTING)
W187	STRESS RELIEVING FIXTURE
W188	RUBBER MASK PLATING
W189	MOULD FOR RUBBER MASK PLATING
W190	COLD FORM DIMPLING TOOL
W191	DISCONTINUED, USE □R□. BURNISHING TOOL
W192	CASTING EQUIPMENT (METAL)
W193	FORGING DIE – FORGING
W194	CURING CAM - CURING SEQUENCE FOR HYDRAULIC PRESS
W195	WATER JET CUTTING EQUIPMENT - WATER JET CUTTING
W196	SUPERFORM TOOLING - TI SUPERFORM PROCESS
W197	MANTREL EXTRACTOR TOOL - COMPOSITES MANUFACTURE
W198	PNEUMATIC TEST EQUIPMENT
W199	COLD RUBBER BOLSTER PRESS TOOL - COLD FORMING ON S.P.S. 23000 TONNE PRESS
W200	CONTROL MASTER GAUGE (FORMALLY JIG REFERENCE MASTER)
W201	MASTER TOOLING GAUGE (FORMALLY JIG REFERENCE)
W202	I.C.Y. CHECKING GAUGE

TOOL No.	TOOL DESCRIPTION – PROCESS DESCRIPTION
W203	MASTER COMPONENT
W204	JIG REFERENCE SUPPORT AND APPLICATION
W205	MASTER PIPE REFERENCE - FOR PIPE LAYOUT AND CUTOFF BOARDS
W206	SUB-MASTER - COMPOSITE MANUFACTURE
W207	DIGITAL MASTER SURFACE MODEL
W208	RESERVED FOR REFERENCE TOOLING
W209	RESERVED FOR REFERENCE TOOLING
W210	MOULD LOFT PRINT – MANUFACTURE AID
W211	HOT FORM RUBBER BOLSTER TOOL - HOT FORMING ON S.P.S. 23000 TONNE PRESS
W212	SHOP MADE TEMPLATE
W213	N.C. FIXTURE – COMPOSITE MANUFACTURE
W214	AIRCRAFT STAGING
W215	ASEA FLUID CELL PRESS
W216	BLANKS AND COVERS