URGENT

***TB 1–2840–229–20–28**

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

ALL UH–1 AND AH–1 SERIES HELICOPTERS WITH T–53 ENGINE INSTALLED, T–53 TURBINE WHEEL COMPONENTS

Headquarters, Department of the Army, Washington, D. C.
17 March 2000

NOTE

THIS PUBLICATION IS EFFECTIVE UNTIL RESCINDED OR SUPERSEDED.

1. Priority Classification. URGENT.

NOTE

IAW AR 95–1, paragraph 6–6.a., MACOM Commanders may authorize temporary exception from SOF message requirements. Exceptions may only occur when combat operations or matter of life or death in civil disasters or other emergencies are so urgent that they override the consequences of continued aircraft operations.

a. Aircraft in Use. Upon receipt of the message/TB (whichever occurs first), the condition status symbol of the cited aircraft will be changed to a **Red Horizontal Dash //–//.** The **Red Horizontal Dash //–//** entry shall state "Inspect aircraft records IAW UH–1–00–06/AH–1–00–06 (TB 1–2840–229–20–28) within the next 7 hours, but NLT 13 March 2000". The **Red Horizontal Dash //–//** may be cleared when the inspection in paragraph 8 is completed. The affected aircraft shall be inspected as soon as practical but NLT the next 7 flight hours or 13 march 2000. Failure to comply with the requirements of the message/TB within the time frame specified will cause the status symbol of the affected aircraft to be changed to a **Red //X//**.

b. Aircraft in Depot Maintenance. Aircraft will not be issued until compliance with this TB has been completed.

c. Aircraft Undergoing Maintenance. Aircraft will not be released until compliance with this TB has been completed.

d. Aircraft in Transit.

(1) Surface/Air Shipment. Same as paragraph 1.a.

***This TB supersedes USAAMCOM Safety of Flight (SOF) Messages, UH–1–00–06 and AH–1–00–06 (251301Z Feb 00).**

(2) Ferry Status.

(a) Inspect at final destination.

(b) Those aircraft that have a DD Form 250 and are at U.S. Helicopters will be inspected prior to ferry to final destination.

e. Maintenance Trainers (Category A and B). N/A.

f. Component/Parts in Stock at All Levels (Depot and Others) Including War Reserves. Upon receipt of subject message or this TB (whichever occurs first), the material condition tags of all items in all condition codes listed in paragraphs 6 and 7 shall be annotated to read "SOF UH–1–00–06 and AH–1–00–06, (TB 1–2840–229–20–28), T53 Turbine Wheel Components Not Complied With."

(1) Wholesale Stock. N/A

(2) Retail Stock. Report receipt of subject message or this TB (whichever occurs first) IAW paragraph 14.c.(2). Upon receipt of subject message or this TB, commanders and others maintaining retail stock at installation level and below shall contact the supported aviation unit to perform the inspection required by paragraph 8 and the correction procedures of paragraph 9 on discrepant materiel. Disposition of discrepant materiel will be IAW paragraph 10. Report compliance with subject message/TB IAW paragraph 14.d.(2).

g. Components/Parts in Work (Depot Level and Others). N/A

2. Task/Inspection Suspense Date. Complete the inspection IAW paragraph 8 within the next 7 flight hours, but NLT 13 March 2000, and report IAW paragraph 14.b, as applicable.

3. Reporting Compliance Suspense Date. No later than 17 March 2000 in accordance with paragraph 14.a. of this TB.

4. Summary of the Problem.

a. Background.

(1) As a result of UH–1–00–03/AH–1–00–04 and UH–1–00–04/AH–1–00–05 (TB 1–2840–229–20–27), a significant number of engines were categorized as unserviceable if the engine DA Form 2408–16 did not list all tracked components. For components with high interim lives (greater than 9000 hours) a calculated time since new (TSN) was used when DA Form 2408–16 information was not available. Components with low lives (less than 5000 hours) could not be assigned a calculated TSN with the same degree of conservatism and were deemed unserviceable.

(2) After an extensive examination of the applicable forms and the record keeping procedures, AMCOM has determined the DA Form 2408–19 (Aircraft Engine Turbine Wheel Historical Record) can be used to accurately determine the TSN on some components previously deemed unserviceable due to a lack of records.

NOTE

The DA Form 2408–19 cannot be used for all subcomponents of the turbine wheels.

b. For Manpower/Downtime and Funding Impacts. See paragraph 12.

c. The purpose of this TB is to:

(1) Allow use of the DA Form 2408–19 to determine the TSN on certain turbine wheel components.

(2) Provide work unit codes (for reporting purposes) for the 16 components covered by SOF UH–1–00–03/AH–1–00–04 and UH–1–00–04/AH–1–00–05 (TB 1–2840–229–20–27), and provide other administrative clarifications to address problems reported as a result of the previous messages.

(3) Require a status report on every engine IAW paragraph 14.b.

(4) Require a special report IAW paragraph 14.b. for any engine that is returned to service as a result of DA Form 2408–19 information, controlled exchange of hot end components, or other maintenance actions.

5. End Items to be inspected. All AH–1 and UH–1 series aircraft T53 engines.

6. Assembly Components to be Inspected.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
1ST GP Rotor Assy (–13B)	1–100–880–12	2840–01–031–8758
2ND GP Rotor Assy (–703)	1–101–100–08	2840–01–010–1450
2ND GP Rotor Assy	1–101–360–04	2840–01–008–5983
2ND GP Rotor Assy	1–100–820–08	2840–00–176–8753
1ST PT Rotor Assy	1–190–010–03	2840–01–010–5949
2ND PT Rotor Assy	1–140–550–07	2840–01–008–5982

NOTE

An engine can have either P/N 1–101–360–04 or 1–100–820–08 installed. Both part numbers will not be found in one engine.

7. Parts to be Inspected.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
1ST STG GP Disc	1–100–133–01	2840–00–924–7933
2ND ST GP Disc	1–100–063–05	2840–00–924–8521
1ST PT Disc	1–190–009–05	2840–00–925–9560
2ND PT Disc	1–140–272–04	2840–01–008–5986

8. Inspection Procedures.

NOTE

Refer to paragraph 9A for work unit codes needed for reporting requirements IAW UH–1–00–03/AH–1–00–04 and UH–1–00–04/AH–1–00–05 (TB 1–2840–229–20–27).

a. Review engine records for compliance with UH–1–00–03/AH–1–00–04 and UH–1–00–04/AH–1–00–05 (TB 1–2840–229–20–27). If the records show that the engine is serviceable IAW UH–1–00–03/AH–1–00–04 and UH–1–00–04/AH–1–00–05 (TB 1–2840–229–20–27), report engine status IAW paragraph 14.b. No further action is required and the inspection is complete.

b. If the engine is unserviceable IAW UH–1–00–03/AH–1–00–04 and UH–1–00–04/AH–1–00–05 (TB 1–2840–229–20–27), inspect the engine DA Form 2408–16 to verify if the engine was unserviceable due to exceeding an interim retirement life, or due to incomplete entries for one or more of the parts listed in paragraph 7 of this TB.

NOTE

DA Form 2408–19 records are not on file at AMCOM, nor can the AMCOM 2410 Hotline reconstruct an erroneous/incomplete DA Form 2408–19.

(1) If the engine is unserviceable due to exceeding an interim retirement life, the engine remains unserviceable and the inspection is complete. Report the engine status IAW paragraph 14.b.

(2) If the engine is unserviceable due to incomplete entries on one or more of the parts listed in paragraph 7 of this TB, locate the DA Form 2408–19 for the next high assembly identified in paragraph 6 of this TB.

NOTE

The serial number of the turbine wheel and the serial number on the disc within the wheel should be identical. If the DA Form 2408–16 data contains a serial number for the wheel or the disc, but not the time data, the serial number listed on the DA Form 2408–16 shall be compared with the serial number of the wheel listed on the DA Form 2408–19. If the serial numbers are not the same, the DA Form 2408–19 shall not be used to assign time to the disc pending engine teardown to determine the actual component serial number in the engine. Using the DA Form 2408–19 data is acceptable even in the event that a turbine wheel serial number is not shown on the DA Form 2408–16.

c. Verify that the serial number of the turbine wheel assemblies on the DA Form 2408–19 is identical to the serial numbers shown on the engine DA Form 2408–16. If the same serial numbers are shown on both forms, or if no serial number is found on the engine DA Form 2408–16, the DA Form 2408–19 can be used to determine the TSN for the lower assembly discs. Proceed to paragraph 8.e.

NOTE

The DA Form 2408–19 is not usable when conflicting information (different serial numbers) is found when comparing the DA Form 2408–16 and the DA Form 2408–19.

d. If different serial numbers are shown on the DA Form 2408–19 and the engine DA Form 2408–16, physical verification of the serial numbers on the installed components is required before being authorized to use the DA Form 2408–19 information.

e. If the serial numbers on the DA Form 2408–16 and DA Form 2408–19 are identical, or no serial number is found on the DA Form 2408–16, use the DA Form 2408–19 to complete the DA Form 2408–16 for each disc as follows:

(1) From the DA Form 2408–19, block 11c(2), enter the engine time to the DA Form 2408–16, block 6e.

(2) From the DA Form 2408–19, block 11e, enter the W/T to the DA Form 2408–16, block 6h.

(3) Enter the Interim Life Limit from paragraph 8.f. of this TB to the DA Form 2408–16, block 6j.

(4) Using the DA Form 2408–16, calculate the next replacement due (block 6k) IAW DA PAM 738–751, page 176, paragraph 6.k.

f. Compare the TSN with the interim life limits previously established IAW UH–1–00–03/AH–1–00–04 and UH–1–00–04/AH–1–00–05 (TB 1–12840–229–20–27) as follows:

PART NUMBER	NATIONAL STOCK NUMBER	INTERIM LIFE LIMIT (HOURS)
1–140–272–04	2840–01–008–5986	1875
1–190–009–05	2840–00–925–9560	4000

PART NUMBER	NATIONAL STOCK NUMBER	INTERIM LIFE LIMIT (HOURS)
1–100–133–01	2840–00–924–7933	4760
1–100–063–05	2840–00–924–8521	12400

NOTE

T53–L–13B Users Only – The DA Form 2408–19 cannot be used to determine the TSN of the 1–100–135–03 1ST GP Sealing Disc. If DA Form 2408–19 has the sealing disc listed, call the 2410 HOTLINE to confirm serviceability. It is possible that the sealing disc was replaced and not recorded on the DA Form 2408–19**.**

NOTE

T53–L–703 Users Only – The –703 engine uses a different 1ST GP Sealing Disc (P/N 1–100–545–03) than the –13B engine. IAW UH–1–00–03/AH–1–00–04 and UH–1–00–04/AH–1–00–05 (TB 1–2840–229–20–27), if the engine DA Form 2408–16 does not list TSN information on the 1–100–545–03 sealing disc, a calculated TSN of 8100 hours can be assigned to this part.

g. Using the recalculated TSN DA Form 2408–19 information:

(1) If any components listed in paragraph 7 of this TB exceed the interim retirement life IAW paragraph 8.e. of this TB, proceed to paragraph 9.b.

(2) If all components listed in paragraph 7 of this TB are below the interim retirement life IAW paragraph 8.e. of this TB, proceed to paragraph 9.c.

9. Correction Procedures.

NOTE

A special report IAW paragraph 14.b. is required if an engine status is changed from unserviceable to serviceable as a result of this TB, Hot End Component Exchange, or other maintenance action.

a. For reporting purposes, the following work unit codes have been assigned to the following components:

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER	WORK UNIT CODE
2ND PT Disc	1–140–272–04	2840–01–008–5986	04A3E01B
1ST PT Disc	1–190–009–05	2840–00–925–9560	04A3A01
1ST GP Seal Disc	1–100–135–03	2840–00–925–2972	04A02B12
1ST Stage GP Disc	1–100–133–01	2840–00–924–7933	04A02B01
Disc and Hub	1–101–250–04	2840–01–154–7142	04A01C08
2ND Stage GP Disc	1–100–063–05	2840–00–924–8521	04A02B04
GP Spacer	1–100–294–03	5365–00–947–6225	04A02B13
Front Comp Shft	1–100–495–07	2840–01–006–1118	04A01C07
Rear Comp Shft	1–100–501–01	2840–00–176–3751	04A01C04
2ND GP Seal Disc	1–100–544–03	2840–01–008–7874	04A02B14
1ST GP Seal Disc	1–100–545–03	2840–01–009–3689	04A02B12

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER	WORK UNIT CODE
GP Spacer	1–100–546–02	5365–01–008–5952	04A02B13
1ST GP Spacer	1–100–559–01	5365–01–010–0958	04A02B11
Power Shaft	1–100–800–04	2840–00–943–2206	04A03F
PT Spacer	1–140–169–04	5365–01–008–5947	04A03A02
Disc and Hub	1–101–250–03	2840–00–176–3746	04A01C08
2ND GP Rotor	1–100–820–08	2840–00–176–8753	04A02D

b. If the TSN for any one component exceeds the interim retirement life IAW paragraph 8.e. of this TB, the engine is considered (remains) unserviceable. Change the aircraft condition staus symbol to a **RED *//X//***. The **RED *//X//*** entry shall state “Replace T53 Engine IAW SOF message UH–1–00–03/AH–1–00–04 and UH–1–00–04/AH–1–00–05 (TB 1–2840–229–20–27).” Replacement engines may not be immediately available. Maintain aircraft on **RED *//X//*** status in flyable storage to include ground run–ups. Report aircraft on **RED *//X//*** status as non mission capable supply (NMCS).

c. If all components listed in paragraph 7 of the message/TB are below the interim retirement life IAW paragraph 8.e. of the message/TB, and no other parts are unserviceable as a result of a previous T53 message/TB, annotate the aircraft records that the engine is serviceable and report engine change of status to the logistical POC IAW paragraph 14.b.

10. Supply/Parts and Disposition.

a. Parts Required. N/A.

b. Requisitioning Instructions. Requisition replacement parts authorized by your maintrenance level using normal supply procedures. All requisitions shall use Project Code (CC 57–59) “XGG” (X–RAY–GULF–GULF). Contact the wholesale materiel POC, paragraph 16.c., prior to submitting requisitions. HQDA will approve releases of available serviceable engines to meet established priorities.

NOTE

Project Code “XGG” is required to track and establish a data base of stock fund expenditures incurred by the Field as a result of SOF actions.

c. Bulk and Consummable Materials. N/A

d. Disposition. Dispose of removed parts/components using normal supply procedures. All turn–in documents must include Project Code (CC 57–59) “XGG”.

e. Disposition of Hazardous Material. N/A.

11. Special Tools and Fixtures Required. N/A

12. Application.

a. Category of Maintenance – AVUM. Aircraft downtime will be charged to AVUM maintenance.

b. Estimated Time Required. Total of 0.5 man–hours using 1 person to conduct the records review.

c. Estimated Cost Impact to the Field. N/A

d. TB/MWOs to be Applied prior to or concurrently with this Inspection. TB 1–2840–229–20–27.

e. Publications which Require Change as a Result of this TB. N/A.

13. References.

a. UH–1–00–03/AH–1–00–04 (DTG 232044Z).

b. Correction to UH–1–00–03/AH–1–00–04 (DTG 271853Z).

c. UH–1–00–04/AH–1–00–05.

d. TB 1–2840–229–20–27.

14. Recording and Reporting Requirements.

a. Reporting Compliance Suspense Date (Engine). Upon entering requirements of the message/TB on DA Form 2408–13–1 on all subject MDS aircraft, forward a priority message, datafax or e–mail to CDR, AMCOM, ATTN: AMSAM–SF–A (SOF Compliance Officer), Redstone Arsenal, AL 35898–5000, IAW AR 95–1. Datafax number is DSN 897–2111 or (256) 313–2111. E–mail address is <safeadm@redstone.army.mil>. The report will cite UH–1–00–06, AH–1–00–06 (TB 1–2840–229–20–28), date of entry in DA Form 2408–13–1, the aircraft MDS and serial numbers of aircraft in numerical order.

b. Task/Inspection Reporting Suspense Date (Engine). Upon completion of inspection, units will forward a priority message to the logistical POC in paragraph 16.b. The report will cite UH–1–00–06, AH–1–00–06 (TB 1–2840–229–20–28), date of inspection, aircraft serial number (if applicable), engine serial number, results of the inspection (passed or failed due to exceeding a life limit, failed due to unknown life history), and if the engine became serviceable as a result of DA Form 2408–19 information, by controlled exchange of hot end components, or other maintenance actions. Inspection and reports will be completed NLT 7 days after task/inspection suspense date.

c. Reporting Message/TB Receipt (Spares).

(1) Materiel in Wholesale Depot Storage. N/A.

(2) Materiel in Retail Storage – Report receipt of the message/TB by e–mail or datafax to the logistical point of contact listed in paragraph 16.b. within 7 days from the date of the message/TB. Provide local point of contact.

d. Task/Inspection Reporting Suspense Date (Spares).

(1) Material in Wholesale Depot Storage. N/A.

(2) Material in Retail Storage. Report compliance with the message/TB to the logistical point of contact listed at paragraph 16.b within 14 days of the date of subject message/TB. Report the quantity inspected by condition code and the resulting condition code. Report by e–mail or datafax and provide local point of contact.

e. The Following Forms are Applicable and are to be Completed in Accordance with DA Pamphlet 738-751, dated 15 Mar 1999:

NOTE

Unit Level Logistics System–Aviation (ULLS–A) users will use applicable electronic “E” forms.

(1) DA Form 2408–5–1, Equipment Modification Record (Engine).

(2) DA Form 2408–13, Aircraft Status Information Record.

(3) DA Form 2408-13-1, Aircraft Inspection and Maintenance Record.

(4) DA Form 2408-15, Historical Record for Aircraft.

(5) DA Form 2408–16, Aircraft Component Historical Record.

(6) DA Form 2408–19, Aircraft Engine Turbine Wheel Historical Record.

(7) DD Form 1574/DD Form 1574–1, Serviceable Tag/Label – Materiel (color yellow). Annotate remarks block with "Inspected serviceable IAW UH–1–00–06, AH–1–00–06, (TB 1–2840–229–20–28)".

(8) DD Form 1575/DD Form 1575–1, Suspended Tag/Label – Materiel (color brown). Annotate remarks block with "Suspended IAW UH–1–00–06, AH–1–00–06, (TB 1–2840–229–20–28)".

(9) DD Form 1577–2/DD Form 1577–3, Unserviceable (reparable) Tag/Label – Materiel (color green). Annotate remarks block with "Unserviceable IAW UH–1–00–06, AH–1–00–06, (TB 1–2840–229–20–28)".

15. Weight and Balance. N/A.

16. Points of Contact.

a. Technical points of contact for the message/TB are:

(1) Primary – Mr. Mark Heitert, AMSAM–RD–AE–P, DSN 897–4964 or (256) 313–4964, datafax is 897–4961. E–mail is <mark.heitert@redstone.army.mil>.

(2) Alternate – Mr. Steve Monaco, AMSAM–AR–E–I–B–U, DSN 645–0078 or (256) 955–0078, datafax is DSN 645–6590 or (256) 955–6590. E–mail is <steve.monaco@uh.redstone.army.mil>.

b. Logistical points of contact for the message/TB are:

(1) UH–1 Primary – Mr. Howard Reeves, AMSAM–DSA–UH–U, DSN 645–0624 or (256) 955–0624; Datafax is DSN 897–3805 or (256) 313–3805; E–mail is <Howard.Reeves@uh.redstone.army.mil>.

(2) UH–1 Alternate – Mr. Charlie Elkins, AMSAM–DSA–UH–U, DSN 645–0073 or (256) 955–0073, datafax is DSN 645–6590 or (256) 955–6590. E–mail is <charlie.elkins@uh.redstone.army.mil>.

(3) AH–1 – Leonard Monk, AMSAM–DSA–AS–ASH–L, DSN 645–7605 or (256) 955–7605, datafax is DSN 645–7125 or (256) 955–7125. E–mail is <leonard.monk@redstone.army.mil>.

c. Wholesale Materiel point of contact (spares) is Ms. Cindy Cash, AMSAM–MMC–VS–UN, DSN 897–1547 or (256) 313–1547; Datafax is DSN 897–1541 or (256) 313–1541. E–mail is <cash–cy@redstone.army.mil>.

d. Forms and records point of contact for the message/TB is Ms. Ann Waldeck, AMSAM–MMC–RE–FF, DSN 746–5564 or (256) 876–5564; Datafax is DSN 746–4904 or (256) 876–4904. E–mail is <waldeck–ab@redstone.army.mil>.

e. Safety point of contact for the message/TB is Mr. Howard Chilton, AMSAM–SF–A, DSN 897–2068 or (256) 313–2068; Datafax is DSN 897–2111 or (256) 313–2111. E–mail is <howard.chilton@redstone.army.mil>.

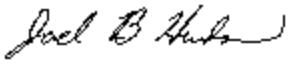
f. Foreign Military Sales (FMS) recipients requiring clarification of action advised by the message/TB should contact either CW5 Joseph L. Wittstrom, Security Assistance Management, AMSAM–SA, DSN 897–0410 or commercial (256) 313–0410; E–mail is <wittstrom–jl@redstone.army.mil>; or alternate POC is Mr. Ronnie W. Sammons, AMSAM–SA–CS–NF, DSN 897–0408 or (256) 313–0408; Datafax is DSN 897–0411 or (256) 313–0411; E–mail is <sammonsrw@redstone.army.mil>. Huntsville, Alabama is GMT minus 6 hrs.

g. After hours contact AMCOM Command Operations Center (COC) DSN 897–2066/2067 or commercial (256) 313–2066/2067.

17. Reporting of Errors and Recommending Improvements. You can improve this TB. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, US Army Aviation and Missile Command, ATTN: AMSAM–MMC–LS–LP, Redstone Arsenal, Alabama 35898–5230. A reply will be furnished to you. You may also send in your comments electronically to our E–mail address at <ls–lp@redstone.army.mil>, or by datafax at DSN 788–6546 or commercial (256) 842–6546. Instructions for sending a DA Form 2028 by E–mail may be found at the back of most Technical Manuals.

By Order of the Secretary of the Army:

Official:



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Chief of Staff

Distribution:

To be distributed in accordance with Initial Distribution Number (IDN) 313894 requirements for TB 1-2840-229-20-28.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER	SIGN HERE

TEAR ALONG PERFORATED LINE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

'VEIGHTS

Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

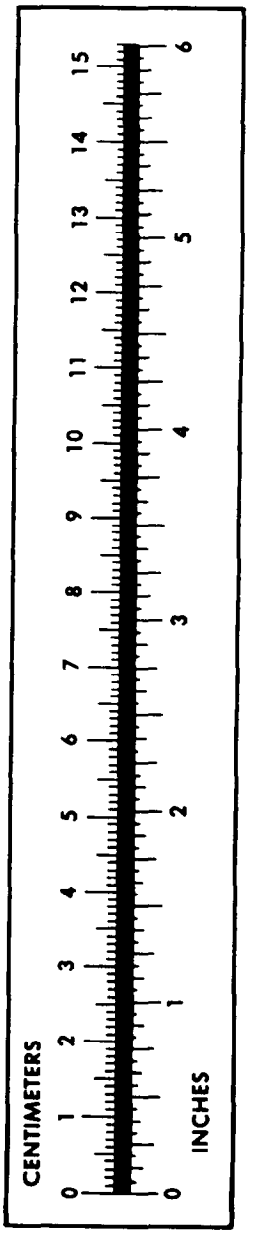
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
ıts	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
lometers per Liter	Miles per Gallon	2.354
meters per Hour	Miles per Hour	0.621



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