

URGENT

*TB 1-2840-229-20-27

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

ALL UH-1 AND AH-1 SERIES HELICOPTERS WITH T-53 ENGINE INSTALLED, INTERIM LIFE LIMITS FOR CRITICAL ROTATING COMPONENTS

Headquarters, Department of the Army, Washington, D. C.
14 January 2000

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NOTE

•THIS PUBLICATION IS EFFECTIVE UNTIL RESCINDED OR SUPERSEDED

•This TB incorporates corrections to UH-1-00-03 and AH-1-00-04, issued on 232044Z DEC99 and 271853Z DEC99 Refer to paragraph 9 Additional guidance has been provided regarding the use of the calculated times listed in paragraph 9 c The equation in paragraph 9 a (1)(c) will be used for all parts with an identifiable serial number and TSN The equation in paragraph 9 a (1)(d) will be used for parts which have a calculated time applied IAW paragraph 9 c

•This TB also includes changes as a result of Revisions UH-1-00-04 and AH-1-00-05, 051129Z, JAN00

1. Priority Classification. URGENT.

NOTE

See AR 95-1, paragraph 6-6 a, for exception authority of major commanders

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 engine historical records IAW UH-1-00-03/AH-1-00-04 and UH-1-00-04/AH-1-00-05 (TB 1-2840-229-20-27) prior to next flight " The **Red Horizontal Dash -** may be cleared when the inspection in paragraph 8 and the correction procedures in paragraph 9 are completed Inspect aircraft not flying as soon as practical but no later than 7 January 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

*This TB supersedes USAAMCOM Safety of Flight (SOF) Messages, UH-1-00-03/AH-1-00-04 (232044Z and 271853Z, DEC 99) and UH-1-00-04/AH-1-00-05 (051129Z, JAN 00).

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

(2) **Ferry Status.** For aircraft away from home station, this TB authorizes a one-time flight, with intermediate stops, to a suitable maintenance facility The one-time flight duration will not exceed 5 flight hours

(3) **Those Aircraft that have a DD 250 and are at US Helicopters.** Will be inspected prior to ferry to final destination

e. Maintenance Trainers (Category A and B). Same as paragraph 1 a

f. **Component/Parts in Stock at All Levels (Depot and Others) Including War Reserves** Upon receipt of subject message (w/revisions) 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-1-00-03/AH-1-00-04, and UH-1-00-04/AH-1-00-05 (TB 1-2840-229-20-27), Interim Retirement Lives for T53 Rotating Components Not Complied With "

(1) **Wholesale Stock.** Report receipt of subject message (w/revisions) or this TB (whichever occurs first) IAW paragraph 14 c (1) Upon receipt of subject message or this TB (whichever occurs first), all serviceable items (condition codes A, B, C, D, and E) listed in paragraphs 6 and 7 located in wholesale depot storage shall be placed in condition code J and tagged with a suspended tag/label - Material, DD Form 1576/DD Form 1576-I Do not remove original condition tags Report compliance with subject message/TB IAW paragraph 14 d (1) Upon completion of inspection, original material condition code tags should be updated to reflect compliance

(2) **Retail Stock.** Report receipt of subject message (w/revisions) 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).** Items listed in paragraphs 6 and 7 in work will not be issued until compliance with this TB has been completed

2. **Task/Inspection Suspense Date.** Prior to next flight, NLT 7 Jan 00 IAW paragraph 14 b

3. **Reporting Compliance Suspense Date.** No later than 30 Dec 1999 in accordance with paragraph 14 a of this TB

4. Summary of the Problem.

a. Engineering analysis shows that 16 T53 critical rotating parts (in addition to the I-1 00-078-07 impeller) are life limited components Although the final analysis is not yet complete, sufficient information has been documented to establish interim retirement lives on these components Field reports directed by safety of flight messages UH-1-00-02 and AH-1-00-03 (TB 1-2840-229-20-23) show that many T53 engines contain components that currently exceed these interim lives and are therefore at risk of failure

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

c. **The purpose of this TB is to:**

- (1) Establish interim retirement lives for 16 T53 critical rotating components
- (2) Assign a calculated Time Since New (TSN) and initiate tracking on previously non-tracked components
- (3) Remove for repair all T53 engines with a part and/or parts exceeding the interim retirement lives

5. **End Items to be inspected.** All AH-1 and UH-1 series aircraft

6. **Assembly Components to be Inspected.**

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
Engine, Aircraft, Turbine T53-L-13B	I-000-060-22	2840-00-I 34-4803
Engine, Aircraft, Turbine T53-L-703	I-000-060-23	2840-00-621-I 860

7. **Parts to be Inspected.**

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
Second PT Disc	I-I 40-272-04	2840-01-008-5986
First PT Disc	1-190-009-05	2840-00-925-9560
First GP Seal Disc	1-100-135-03	2840-00-925-2972
First Stage GP Disc	I-I 00-I 33-01	2840-00-924-7933
Disc and Hub	I-I 01-250-04	2840-01-I 54-7142
Disc and Hub	I-I 01-250-03 (replaced by I-1 01-250-04)	2840-00-I 76-3746
Second Stage GP Disc	I-1 00-063-05	2840-00-924-8521
GP Spacer	I-I 00-294-03	5365-00-947-6225
Front Compressor Shaft	I-1 00-495-07	2840-01-006-I 118
Rear Compressor Shaft	I-I 00-501-01	2840-00-I 76-3751
Second GP Seal Disc	I-I 00-544-03	2840-01-008-7874
First GP Seal Disc	I-I 00-545-03	2840-01-009-3689
GP Spacer	I-1 00-546-02	5365-01-008-5952
First GP Spacer	I-1 00-559-01	5365-01-01 O-0958
Power Shaft	I-1 00-800-04	2840-00-943-2206
PT Spacer	I-140-169-04	5365-01-008-5947

8. **Inspection Procedures.**

- a. Review the engine DA Form 2408-I 6 to obtain the Time Since New (TSN) for the following parts
Compare the TSN with the new interim life limit shown below

NOTE

For parts where the TSN can not be determined, refer to paragraph 9 c

PART NUMBER	NATIONAL STOCK NUMBER	INTERIM LIFE LIMIT (HOURS)
I-140-272-04	2840-01-008-5986	1875
I-I 90-009-05	2840-00-925-9560	4000

PART NUMBER	NATIONAL STOCK NUMBER	INTERIM LIFE LIMIT (HOURS)
1-100-135-03	2840-00-925-2972	4575
1-100-133-01	2840-00-924-7933	4760
1-101-250-04	2840-01-154-7142	9425
1-100-063-05	2840-00-924-8521	12400
1-100-294-03	5365-00-947-6225	14275
1-100-495-07	2840-01-006-1118	14275
1-100-501-01	2840-00-176-3751	14275
1-100-544-03	2840-01-008-7874	14275
1-100-545-03	2840-01-009-3689	14275
1-100-546-02	5365-01-008-5952	14275
1-100-559-01	5365-01-010-0958	14275
1-100-800-04	2840-00-943-2206	16650
1-140-169-04	5365-01-008-5947	16650
1-101-250-03	2840-00-176-3746	9425

b. If the TSN for all parts are less than the interim life limit identified in the right hand column of paragraph 8 a, apply the correction procedures IAW paragraph 9 a

c. If the TSN for any of the parts listed in paragraph 8 a exceeds the life limit identified in the right hand column of paragraph 8 a , apply the correction procedures IAW 9 b

9. Correction Procedures.

a. If all engine components listed in paragraph 8 a do not exceed their applicable TSN from the right hand column, or you are entering a calculated TSN for a component from paragraph 9 c , annotate the engine records that the inspection is complete and enter into the engine DA Form 2408-16 the appropriate replacement time for each part in paragraph 8 a from the interim life limit column

(1) Change the current entries on the engine DA Form 2408-1 6 for all items listed in paragraph 7 as follows

(a) Blocks 6D and 6G change from "CC" to "RC"

(b) Block 6J enter the new life limit (hours) for each part

(c) For items where the serial number and TSN is known use the following formula = Block 6K enter the replacement due time (A/C hours) using the following equation = (Engine DA Form 2408-1 6) 6J minus 6H plus 6E (Aircraft TC DA Form 2408-16 engine installation entry) 6E minus 6H equals 6K on engine DA Form 2408-1 6 This calculation must be done for each item listed in paragraph 7

(d) For items where the serial number is not known and the item is being assigned a serial number and calculated TSN IAW paragraph 9 c , use the following formula = Block 6K enter the replacement due time (A/C hours) using the following equation = Item assigned interim life limit (paragraph 8 a) minus item calculated time since new (paragraph 9.c) plus current aircraft hours equals block 6K

NOTE

Enter current engine hours in block 6E of the component form (Engine DA Form 2408-1 6)

b. If the TSN for any one part exceeds the life limit identified in the right hand column of paragraph 8 a , the engine is considered unserviceable Change the aircraft condition status 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 I-2840-229-20-27) " Replacement engines may not be immediately available Coordinate with the Logistics POC prior to removing engines from aircraft on a **RED X** condition status symbol Maintain aircraft on a **RED X** condition status symbol in flyable storage to include ground run-ups Report aircraft on a **RED X** condition status symbol as non mission capable supply (NMCS)

c. Some of the components in paragraph 8 a were not previously tracked components or the engine records do not reflect a TSN or a component serial number Therefore, a calculated TSN must be assigned If the TSN for the following components (only) cannot be determined from the engine records, assign the following calculated TSN and apply the corrective action IAW paragraph 9 a -

NOTE

Parts that are assigned a calculated TSN and the serial number is unknown, the DA Form 2408-I 6 will show the part as having the same serial number as the engine in which it is installed Annotate in the remarks section of the DA Form 2408-16 all parts that have a calculated TSN Directions concerning DA Form 2410 submittal will be forthcoming

PART NUMBER	NATIONAL STOCK NUMBER	CALCULATED TSN (HOURS)
I-101-250-04	2840-01-154-7142	9000
I-I 00-063-05	2840-00-924-8521	10200
I-I 00-294-03	5365-00-947-6225	10200
I-I 00-495-07	2840-01-006-I 118	7800
I-I 00-501-01	2840-00-I 76-3751	9600
I-I 00-544-03	2840-01-008-7874	8100
I-I 00-545-03	2840-01-009-3689	8100
I-I 00-546-02	5365-01-008-5952	8100
I-I 00-559-01	5365-01-01 O-0958	8100
I-100-800-04	2840-00-943-2206	10200
I-140-169-04	5365-01-008-5947	9000
I-I 01-250-03	2840-00-176-3746	9000

10. Supply/Parts and Disposition.

a. **Parts Required** - Items cited in paragraphs 6 and 7 may be required to replace defective items

b. **Requisitioning Instructions** - Requisition replacement parts using normal supply procedures All requisitions shall use project code (CC 57-59) "**XF9**" (**XRAY-FOXTROT-9**) 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 "**XF9**" 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 Consumable 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) **XF9**

e. **Disposition of Hazardous Material** - IAW Environmental Protection Agency directives as implemented by your servicing Environmental Coordinator (AR 200-I)

11. Special Tools, Jigs and Fixtures Required. N/A

12. Application.

a. Category of Maintenance.

- (1) AVUM for the records review and removal and reinstallation of the engine
- (2) Aircraft downtime will be charged to AVUM maintenance

b. Estimated Time Required.

- (1) Total of 10 man-hours using 1 person to conduct the records review
- (2) Total of 280 man-hours using 2 persons to remove and reinstall the engine
- (3) Total of 14 hours downtime for one end item.

c. Estimated Cost Impact to the Field.

NOMENCLATURE	NATIONAL STOCK NUMBER	P/N	QTY	COST EA.	TOTAL \$
Engine, AFCT, Turboshaft, T53-L-13B	2840-00-I 34-4803	I-000-060-22	1	\$416,768	6416,768

Total cost per UH-1 = \$416,768

NOMENCLATURE	NATIONAL STOCK NUMBER	P/N	QTY	COST EA.	TOTAL \$
Engine, AFCT, Turboshaft, T53-L-703	2840-00-621-I 860	I-000-060-23	1	\$158,215	\$158,215

Total cost per AH-1 = \$158,215

d. TB/MWOs to be Applied prior to or concurrently with this Inspection. N/A

e. **Publications which Require Change as a Result of this SOF message/TB.** - A copy of this message/TB shall be inserted in the appropriate TM as authorii to implement the change until the printed change is received,

- (1) TB I-I 500-341-01
- (2) TM 55-2840-229-23 series
- (3) DMWR 1-2840-I 13 series

13. References. TB I-2640-229-20-23

14. Recording and Reporting Requirements.

a. Reporting Compliance Suspense Date (Aircraft). Upon entering requirements of this message/TB on DA Form 2408-13-I on ail 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-I **Datafax** number is DSN 897-2111 or (256) 313-2111 E-mail address is **<safeadm@redstone army mil>** The report will cite the **message/TB** number, date of entry in DA Form 2408-I **3-1**, the aircraft MDS and serial numbers of aircraft in numerical order.

b. **Task/inspection Reporting Suspense Date (Aircraft).** Upon completion of inspection, units will forward a priority message to the logistical POC in paragraph 16 b The report **will** cite the message number (UH-1 -00-04/AH-1-00-05), TB number, date of inspection, aircraft serial number, engineserial number and operating hours, and results of the inspection (engine pass or fail) Include in the report the pass/fail status of all spare/uninstalled engines Inspection and reports will be completed no later than 07 Jan 00

c. Reporting Message/TB Receipt (Spares).

(1) **Material in wholesale depot storage** – Report receipt of the **message/TB** by e-mail or **datafax** to the wholesale materiel (spares) point of contact listed in paragraph 16 c within 3 working days from the date of subject message Provide local point of contact

(2) **Material 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 subject message Provide local point of contact

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

(1) **Material in Wholesale Depot Storage.** Report compliance with the **message/TB** to the wholesale materiel point of contact (spares) listed in paragraph 16 c within 7 days of the date of the **message/TB** on DD Form 1225 Provide the cost of compliance with the **message/TB** to include an estimate of the cost reimbursable funding required to move serviceable items on hand listed in paragraphs 6 and 7 to a work area, unpack the materiel, repack the materiel after inspection by ATCOM inspectors, and to return the materiel to storage, as appropriate Report, by original serviceable condition code, the quantity of materiel placed in condition code J Report by e-mail or **datafax** and provide local point of contact

(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 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 738751, 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-I 3, Aircraft Status Information Record

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

(4) DA Form 2408-I 5, Historical Record for Aircraft

(5) DA Form 2408-I 6, Aircraft Component Historical Record

(6) DA Form 2410, Component Removal and Repair/Overhaul Record (only if engine is removed)

(7) DD Form 1574/DD Form 1574-1, Serviceable Tag/Label – Materiel (color yellow) Annotate remarks block with "Inspected serviceable IAW UH-I-00-04, AH-1-00-05, (TB I-2840-229-20-27)"

(8) DD Form 1575/DD Form 1575-1, Suspended Tag/Label – Materiel (color brown) Annotate remarks block with "Suspended IAW UH-I-00-04, AH-1 -00-05, (TB I-2840-229-20-27)"

(9) DD Form 1577-2/DD Form 1577-3, Unserviceable (reparable) Tag/Label – Materiel (color green) Annotate remarks block with "Unserviceable IAW UH-I-00-04, AH-I -00-05, (TB I-2840-229-20-27)"

15. Weight and Balance. N/A

16. Points of Contact.

a. Technical point 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 this **message/TB** are

(1) UH-1 Primary – Mr Charles **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>

(2) UH-1 Alternate – 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 <choward.reeves@uh.redstone.army.mil>

(3) AH-1 – LTC William Gavora, **AMSAM-DSA-ASH**, DSN 645-7004 or (256) 955-7004, **datafax** is DSN 645-7125 or (256) 955-7125 E-mail is <william.gavora@redstone.army.mil>

c. Wholesale Materiel point of contact (spares) is Ms Cindy Cash, **AMSAM-MMC-VS-UN**, DSN 897-I 547 or (256) 313-1547, **Datafax** is DSN 897-I 541 or (258) 313-1541 E-mail is <cash-cy@redstone.army.mil>

d. Forms and records point of contact for this **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 <choward.chilton@redstone.army.mil>


f. Foreign Military Sales (FMS) recipients requiring clarification of action advised by this **message/TB** should contact either CW5 Joseph L Wittstrom, Securi Assistance Management, **AMSAM-SA**, DSN 897-0681 or commercial (256) **313-0681**, E-mail is <wittstrom-jl@redstone.army.mil> 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 <sammons-rw@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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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

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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.

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

THE METRIC SYSTEM AND EQUIVALENTS

WEIGHT MEASURE

1 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

WEIGHTS

1 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

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

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
its	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
ometers per Liter	Miles per Gallon	2.354
ometers per Hour	Miles per Hour	0.621



PIN: 077752-000