URGENT

***TB 1–2840–229–20–30**

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

ALL UH–1 SERIES AIRCRAFT WITH T53 ENGINES, REPAIR PROCEDURES FOR ENGINES THAT FAIL VIBRATION SCREENING IAW TB 1–2840–229–20–15, UH–1–01–02

Headquarters, Department of the Army, Washington, D. C.

20 November 2000

NOTE

THIS PUBLICATION IS EFFECTIVE UNTIL RESCINDED OR SUPERSEDED.

NOTE

This is a Safety of Flight Message/TB issued IAW AR 95–1, Chapter 6, 1 Sep 97. This message/TB has not been transmitted to units subordinate to addressees. Addressees should immediately retransmit this message/TB to all subordinate units, activities, or elements affected or concerned. The retransmittal shall reference this message/TB. Action addresses will immediately verify this transmission to CDR, AMCOM, ATTN: AMSAM–SF–A (SOF Compliance Officer).

1. Priority Classification. URGENT.

NOTE

IAW AR 95–1, paragraph 6–6.a., MACOM commanders may authorize temporary exception from SOF message requirements. Exception 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 operation.

***This TB supersedes USAAMCOM Aviation Safety Action Message 191713Z OCT 2000, UH–1–01–02.**

a. Aircraft in Use. Upon receipt of this message/TB, make the following entry on the DA Form 2408–13–1. Enter a **Red HORIZONTAL DASH //–//** status symbol with the following statement: "Inspect aircraft engine historical records IAW UH–1–01–02 (TB 1–2840–229–20–30) as soon as practical, but NLT 2 November 2000" Clear the **RED HORIZONTAL DASH //–//** when the procedures IAW paragraphs 8 and 9 are completed. Commanders who are unable to comply with the requirements of this message/TB within the time frame specified will upgrade the affected aircraft status symbol to a **RED //X//.**

b. Aircraft in Depot Maintenance. Depot Commanders will not issue aircraft until they are in compliance with this message/TB.

c. Aircraft Undergoing Maintenance. Commanders and Facility Managers will not issue aircraft until they are in compliance with this message/TB.

d. Aircraft in Transit.

(1) Surface/Air Shipment. Inspect at final destination.

(2) Ferry Status.

(a) Inspect at final destination.

(b) U.S. Helicopters will inspect DD Form 250 aircraft prior to those aircraft departing for 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. N/A.

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

2. Task/Inspection Suspense Date. NLT 2 November 2000.

3. Reporting Compliance Suspense Date. Report compliance IAW paragraph 14.a. NLT 9 November 2000.

4. Summary of the Problem.

a. UH–1–98–05 (TB 1–2840–229–20–15) established the vibration screening procedures initially used to detect the vibrations associated with N2 spur gear. When these screening procedures were revised by UH–1–98–08 (TB 1–2840–229–20–18), the plan was announced that a certain quantity of "vibing engines" would be repaired by Corpus Christi Army Depot (CCAD) Engine Service Center trained repair sites. There are now limited quantities of modified nose reduction gearboxes, redesigned accessory carrier assemblies, and replacement sun gears (including consumable items) to be used by the CCAD Engine Service Center trained repair sites to return vibing engines to service. Once repaired and returned to service. These engines will be subject to the recurring 150 hour vibration inspection in accordance with TB 1–2840–229–20–18.

(1) The parts/assemblies required to repair these engines will not be free issue.

(2) Due to the impending retirement of the AH–1 fleet, this message/TB is not applicable to the –703 engine.

(3) Any engine overhauled after January 2000 at Corpus Christi Army Depot will have the new configuration assemblies (nose reduction gear assembly and accessory carrier assembly) installed.

(4) Aircraft with engines that have received the coated N2 Spur Gear and have passed the vibration inspection of TB 1–2840–229–20–18 shall continue to adhere to the inspection requirements of TB 1–2840–229–20–18 as long as they pass the screening. These engines will receive new configuration

components during the next major repair at Depot or CCAD Engine Service Center Trainer Repair Sites if the engine fails a subsequent AVA vibration test or requires major repairs.

(5) In accordance with SOF UH–1–99–04, all T53–L–13B series engines that do not have the coated Spur Gear installed should have been removed from service on 30 June 2000.

(6) FMS Users – Due to the limited availability of assets to repair vibrating engines, FMS message 3 (R041921Z Dec 98) remains in effect.

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

c. The Purpose of this Message/TB is to:

(1) Inform the UH–1 community that the parts required for repair of vibing engines are now available.

(2) Provide instructions to the CCAD Engine Service Center Trained Repair Sites for obtaining the repair procedures and MACOM approval to repair failed engines.

5. End Items to be inspected. All UH–1 T53–L–13B (P/N 1–000–060–22) engines.

6. Assembly Components to be Inspected.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
T53–L–13B Engine	1–000–060–22	2840–00–134–4803

7. Parts to be Inspected. N/A.

8. Inspection Procedures

a. Inspect the aircraft engine historical records to determine which engines have failed the engine vibration inspection IAW TB 1–2840–229–20–15 or TB 1–2840–229–20–18. Any engine that has failed either of these inspections is a potential candidate for this repair.

NOTE

When identifying candidate engines to be repaired, SOF UH–1–01–01 (TB 1–2840–229–20–29) should also be used to determine future serviceability of engines due to component finite lives.

b. For engines that have passed the vibration screening IAW TB 1–2840–229–20–18, the inspection is complete and the **RED HORIZONTAL DASH //–//** entry shall be cleared.

c. For engines identified as having failed the vibration screening IAW TB 1–2840–229–20–18, proceed to paragraph 9.

9. Corrective Procedures.

NOTE

The CCAD Engine Service Center Trained Repair Sites will be using a revised AMCOM approved procedure to install the nose reduction gearbox assembly, accessory carrier assembly, and replacement Sun Gear. The DMWR 1–2840–113, TM 55–2840–229–23, and TM 1–2840–260–23P have been updated to show changes and parts.

a. For engines that have failed the vibration screening IAW TB 1–2840–229–20–15 or TB 1–2840–229–20–18, contact your MACOM to schedule repair of the engine by a CCAD Engine Service Center Trained Repair Site.

b. Only MACOM approved and CCAD Engine Service Center Trained Repair Sites shall repair the High N2 vibration engines on priority aircraft engines. Authorized sites will:

(1) Contact the MACOM POC (paragraph 16.c.) for the quantity of engines to be returned to service.

(2) Contact the logistical POC in paragraph 16.b. to:

(a) Confirm that previously trained technicians are still available and current in the repair procedure, prior to receiving the procedure.

(b) Obtain the revised procedure for this repair.

NOTE

All T53 engines (including engines repaired via this message/TB) shall continue to be tested IAW TB 1–2840–229–20–18. A test cell vibration inspections does not replace the field level inspection due when an engine is installed in an airframe. For follow–on inspections, it is allowable to apply a plus or minus ten percent time tolerance per TM 1–1500–328–23 for the purpose of completing the vibration screening during the 150 phase inspection.

c. Upon completion of installing the new nose reduction gearbox, accessory carrier assembly, and replacement Sun Gear, the CCAD Engine Service Center Trained Repair Sites shall send the worksheet to the logistical POC (paragraph 16.b.)

d. Upon installation of the engine into the airframe the AVA vibration inspection shall be performed IAW the procedures specified in TB 1–2840–229–20–18.

e. If the engine passes the vibration inspection after installation of the components:

(1) The condition status symbol **RED *//X//*** may be cleared and the aircraft shall be released from all flight restrictions imposed by TB 1–2840–229–20–15.

(2) Engines that are repaired and returned to service will be subject to the recurring 150 hour vibration inspection in accordance with TB 1–2840–229–20–18.

f. Following repair of the engine IAW this message, if the engine fails the vibration inspection after installation:

(1) The aircraft condition status symbol shall be changed to **RED *//X//*** and shall not be flown.

(2) Contact the logistics POC listed in paragraph 16.b.

(3) At the discretion of the local commander, all aircraft that fail the AVA vibration inspection (**RED *//X//*** status) shall be placed in an appropriate aircraft storage category per TM 55–1520–210–23–3.

10. Supply/Parts and Disposition.

a. Parts Required.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
Nose Reduction Gearbox	1–030–350–18	2840–01–459–1267
Accessory Carrier Assy	1–070–220–10	2840–01–458–8639
Sun Gear	1–030–192–04	3040–00–878–5940

b. Requisitioning Instructions. Use normal supply system procedures. AMCOM/DA is not funding the effort. Contact the MACOM POC (paragraph 16.c.) for funding questions. For the purpose of this

message/TB, the nose reduction gearbox, accessory carrier assembly, Sun Gear, and N2 replacement kit shall be requisitioned at the same time.

c. Bulk and Consumable Materials.

(1) AMCOM provided parts kits are available for each engine repaired.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
N2 Replacement Kit	T5306–KT	3020–01–462–0434

NOTE

The N2 replacement kit was developed for installation of the N2 Spur Gear and may contain items not required for this repair.

(2) Authorized repair facilities may procure the following list of consumable parts individually per each engine to be repaired in lieu of the N2 replacement kit.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER	QTY
Retainer Bolt	1–030–141–03	2840–00–084–7761	1 EA
Seal Tubing	1–300–368–01	5330–00–570–9811	1 EA
Washer Convex	1–030–138–04	5310–00–613–7435	1 EA
Lockcup	1–070–066–03	5340–01–430–0385	1 EA
Gasket	MS9134–01	5330–00–023–7623	2 EA
Packing	M83248/1–230	5330–00–165–1948	1 EA
Packing	M83248/1–008	5331–00–166–0967	2 EA
Packing	M83248/1–012	5331–00–166–0980	2 EA
Packing	M83248/1–013	5331–00–166–0988	6 EA
Packing	M83248/1–014	5331–00–166–0990	7 EA
Packing	M83248/1–015	5331–00–166–0991	5 EA
Packing	M83248/1–113	5331–00–166–1062	2 EA
Packing	M83248/1–114	5331–00–166–1063	1 EA
Packing	M83248/1–122	5331–00–167–5111	2 EA
Packing	M83248/1–128	5331–00–167–5116	1 EA
Packing	M83248/1–131	5331–00–167–5119	1 EA
Packing	M83248/1–144	5331–00–167–5126	1 EA
Packing	M83248/1–138	5331–00–537–3929	1 EA
Gasket	1–080–026–01	5330–01–388–3065	1 EA
Gasket	1–080–025–01	5330–00–656–8534	1 EA
Packing	1–020–017–01	5331–00–766–8653	1 EA
Gasket	1–160–454–01	5330–01–374–9261	1 EA

d. Disposition.

(1) Demilitarize/mutilate the accessory carrier assembly (P/N 1–070–220–13/14) and Sun Gear (P/N 1–030–192–04) IAW TM 1–1500–328–23.

(2) Nose reduction gearbox assembly (P/N 1–030–350–12) shall be returned to the Depot using the routine supply system requirements. No credit will be given for this turn–in.

e. Disposition of Hazardous Material. N/A.

11. Special Tools and Fixtures Required.

TOOL DESCRIPTION	PART NUMBER	NATIONAL STOCK NUMBER
Holding Fixture Carrier Assy	LTCT3040	4920–00–946–2188
Wrench Assy Nut	LTCT4020	5120–00–917–7116
Holder, Sun Gear	LTCT2075	4920–00–923–2773
Installer Spur Gear	LTCT4576	2840–00–842–6130
Puller Sun Gear	LTCT2021	5120–00–804–2629
Flag Backlash Gage	LTCT4564	4920–00–842–6126
Driver Spur Gear	LTCT258	5120–00–778–0661
Flag	LTCT2099	5220–00–906–3926
Puller Mechanical Gear	LTCT2028	5120–00–757–4910
Spanner Nut	LTCT2133	5120–00–952–7257
Backup Gear Block	LTCT108	5120–00–716–5581
Spanner Wrench Socket	LTCT696	5120–00–923–3445
Holder Gear Assy	LTCT4996	CCAD Tool Number 73 SAVAE–D–0068
Puller Mechanical	LTCT675	5120–00–780–4423
Bushing Sleeve	LTCT3636	3120–00–071–8261
Thread Lifting Fixture	LTCT4182	4920–00–994–1129
Machine Bolts (3 EA)	LTCT1429	5120–00–959–7634
Deforming Bolt Retainer	LTCT509	5120–00–446–1586
Bushing Sleeve Bearing Installer	LTCT3640	3120–00–067–8320
Guide Retainer Gear	LTCT4602	4920–00–891–8372
Bearing Remover/Installer	LTCT30741	Contact Log POC

12. Application.

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

b. Estimated Time Required.

(1) Estimated Time to Complete the Records Inspection. Total of 0.5 man–hours using 1 person.

(2) Estimated Time to Repair the Engine:

(a) Total of 42 man–hours using 3 persons.

(b) Total of 14 hours downtime for one end item.

c. Estimated Cost Impact to the Field.

NOMENCLATURE	P/N	NSN	QTY.	COST EA.
Nose Reduction Gearbox	1–030–350–18	2840–01–459–1267	1	$10,001.00
N2 Carrier Assy	1–070–220–10	2840–01–458–8639	1	15,259.02
Sun Gear	1–030–192–04	3040–00–879–5940	1	352.04
N2 Replacement Kit	T5306–KT	3020–01–462–0434	1	252.00
TOTAL COST PER UH–1 AIRCRAFT		$25,864.06		

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 Inspection. A copy of this message/TB shall be inserted in the appropriate TM/DMWR as authority to implement the change until the printed change is received.

(1) TM 1–2840–260–23P.

(2) TM 55–2840–229–23.

(3) DMWR 1–2840–113, Volumes 1– 4.

13. References.

a. DA PAM 738–751, 15 Mar 99.

b. TM 1–2840–260–23P.

c. TM 55–2840–229–23.

d. DMWR 1–2840–113, Volumes 1– 4.

e. TM 1–1500–328–23.

f. TB 1–2840–229–20–15.

g. TB 1–2840–229–20–18.

14. Recording and Reporting Requirements.

a. Reporting Compliance Suspense Date (Aircraft). Upon entering requirements of this message/TB on DA Form 2408–13–1 on all subject mission design series (MDS) aircraft, Commanders will 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 commercial (256) 313–2111. E–mail address is <safeadm@redstone.army.mil>. The report will cite UH–1–01–02 (TB 1–1520–229–20–30), date of entry on DA Form 2408–13–1, aircraft MDS, and serial numbers of aircraft in numerical order.

b. Task/Inspection Reporting Suspense Date (Aircraft). No special report of the results of this inspection is required.

NOTE

Back lash pattern worksheet is require to be forwarded to the Logistics POC in paragraph 16.b.(1). upon completion of repair of each engine.

c. Reporting Message/TB Receipt (Spares). N/A.

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

e. The Following Forms are Applicable and are to be Completed in Accordance with DA Pamphlet 738-751, dated 15 March 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 2410, Component Removal and Repair/Overhaul Record (only if engine is removed/replaced).

(7) DD Form 1577/DD Form 1577–1, Unserviceable (Condemned) tag/label – Materiel (Color Red). Annotate remarks block with "Condemned IAW UH–1–01–02 (TB 1–2840–229–20–30) and mutilated IAW TM 1–1500–328–23."

(8) DD Form 1577–2/DD Form 1577–3, Unserviceable (Reparable) tag/label – Materiel (Color Green). Annotate remarks block with "Unserviceable IAW UH–1–01–02 (TB 1–2840–229–20–30)."

15. Weight and Balance. N/A.

16. Points of Contact:

a. Technical points of contact for this TB are:

(1) Primary – Mr. Martin Ohrenberg, AMSAM–RD–AE–P, DSN 897–3887 or Commercial (256) 313–3887. Datafax is DSN 897–4961 or Commercial (256) 313–4961. E–mail is <martin.ohrenberg@redstone.army.mil>.

(2) Alternate (Airframes) – Mr. Steve Monaco, AMSAM–RD–AE–I–D–U, DSN 645–0078 or Commercial (256) 955–0078. Datafax is DSN 645–6590 or Commercial (256) 955–6590. E–mail is <steve.monaco@UH.redstone.army.mil>.

b. Logistical points of contact for this TB are:

(1) Primary – Mr. Charlie Elkins, AMSAM–DSA–UH–U, DSN 645–0073 or Commercial (256) 955–0073. Datafax is DSN 897–3762 or (256) 313–3762. E–mail is <charlie.elkins@UH.redstone.army.mil>.

(2) Alternate – Mr. Howard Reeves, AMSAM–DSA–UH–U, DSN 645–0624 or Commercial (256) 955–0624. Datafax is DSN 987–3805 or Commercial (256) 313–3805. E–mail is <howard.reeves@UH.redstone.army.mil>.

(3) FMS POC – Mr. Harry Pour, AMSAM–SA–CS–NF, DSN 987–0867 or Commercial (256) 313–0867. Datafax is DSN 897–0411 or Commercial (256) 313–0411. E–mail is "harry.pour@redstone.army.mil".

c. MACOM points of contact are:

(1) AMC – John Savelli, DSN 767–9891 or Commercial (703) 616–9891.

(2) FORSCOM – MSG Tucker, DSN 367–6239.

(3) NGB – MAJ David Gereski, DSN 327–7773 or Commercial (703) 607–7773.

(4) MDW – CPT Al Robison, DSN 656–7647.

(5) ATEC –Jeff Stayton, DSN 761–4985.

(6) TRADOC – Judy Dyer, DSN 680–5683.

(7) USAREUR – Dave Spinks, 011–49–631–413–8900.

d. Wholesale Material Point of Contact (Spares) for this TB is: Ms. Cynthia Cash, AMSAM–MMC–VS–UN, DSN 897–1547 or Commercial (256) 313–1547. Datafax is DSN 897–1541 or Commercial (256) 313–1541. E–mail is <cynthia.cash@redstone.army.mil>.

e. Forms and Records point of contact for this TB is: Ms. Ann Waldeck, AMSAM–MMC–RE–FF, DSN 746–5564 or Commercial (256) 876–5564. Datafax is DSN 746–4904 or Commercial (256) 876–4904. E–mail is <ann.waldeck@redstone.army.mil>.

f. Safety points of contact for this TB are:

(1) Primary – Mr. Harry Trumbull (SAIC), AMSAM–SF–A, DSN 897–2095 or (256) 313–2095. Datafax is DSN 897–2111 or Commercial (256) 313–2111. E–mail is <harry.trumbull@redstone.army.mil>.

(2) Alternate – Mr. Signey Hernandez, AMSAM–SF–A, DSN 897–2094 or Commercial (256) 313–2094. Datafax is DSN 897–2111 or Commercial (256) 313–2111. E–mail is <signey.hernandez@redstone.army.mil>.

g. Foreign Military Sales recipients requiring clarification of action advised by this TB should contact: CW5 Joseph L. Wittstrom, Security Assistance Management, AMSAM–SA, DSN 897–0410 or Commercial (256) 313–0410. E–mail is <joseph.wittstrom@redstone.army.mil>. or Mr. Ronnie W. Sammons, AMSAM–SA–CS–NF, DSN 897–0408 or Commercial (256) 313–0408. Datafax is DSN 897–0411 or Commercial (256) 313–0411. E–mail is <ronnie.sammons@redstone.army.mil>. Huntsville, AL, is GMT minus 5 hours.

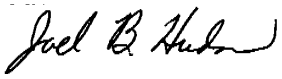
h. After hours contact the AMCOM Command Operations Center (COC) DSN 897–2066/2067 or Commercial (256) 313–2066/2067.

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 35898–5000. 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:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff



JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0031305

DISTRIBUTION:
To be distributed in accordance with Initial Distribution No. (IDN) 313951, requirements for TB 1-2840-229-20-30.

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BE EXACT PIN-POINT WHERE IT IS

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

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PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER	SIGN HERE

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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

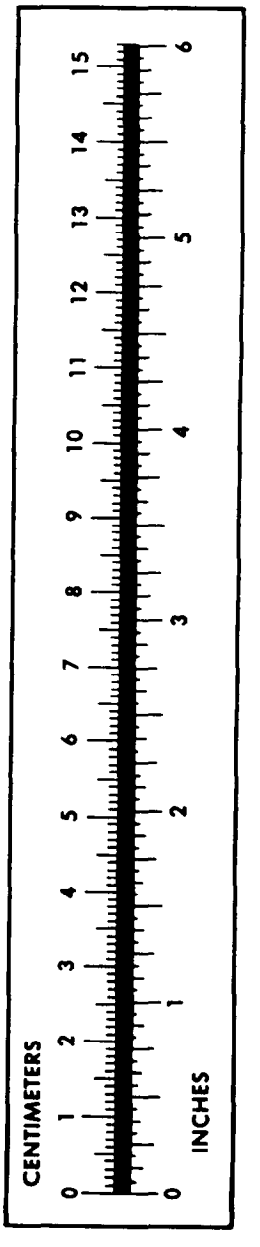
TEMPERATURE

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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