

# URGENT

TB 1-1520-240-20-129

## DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

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### COMBINING TRANSMISSION COOLING FAN DRIVE SHAFT INSPECTIONS ON ALL CH-47D, MH-47D AND MH-47E AIRCRAFT

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Headquarters, Department of the Army, Washington, D. C.  
29 September 2000

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**DISTRIBUTION STATEMENT A:** Approved for public release; distribution is unlimited.

#### NOTE

THIS PUBLICATION IS EFFECTIVE UNTIL RESCINDED OR SUPERSEDED.

1. **Priority Classification. Urgent**

#### NOTE

In accordance with AR 95-1, paragraph 6-6A, 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.

a. Aircraft in Use. Upon receipt of this Technical Bulletin, make the following entry on the DA Form 2408-13-1. Enter a red horizontal dash //--// status symbol with the following statement: "Inspect combining transmission cooling fan drive shaft in accordance with CH-47-00-07, TB 1-1520-240-20-129 prior to next flight, but no later than 11 OCT 00." Clear the red horizontal dash //--// entry when the procedures in accordance with paragraph 8 and 9 are completed. The affected aircraft shall be inspected as soon as practical but no later than 11 OCT 00. Commanders who are unable to comply with the requirements of this Technical Bulletin 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 Technical Bulletin.

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

d. Aircraft in Transit.

(1) Surface/Air Shipment. Prior to first flight.

(2) Ferry Status.

This TB supersedes USAAMCOM Message 261530Z SEP 00 SOF CH-47-00-07

**TB 1-1520-240-20-129**

- (a) Prior to next flight.
- (b) Boeing will inspect DD 250 aircraft prior to those aircraft departing for ferry to final destination.
- e. Maintenance Trainers (Category A and B). Same as paragraph 1a.
- f. Component/Parts in Stock at All Levels (Depot and Others) including War Reserves. Upon receipt of this Technical Bulletin, Depot and Materiel Activity Commanders will ensure the materiel condition tags of all items in all condition codes listed in paragraphs 6 and 7 are annotated to read "CH-47-00-07, TB 1-1520-240-20-129, Combining Transmission Cooling Fan Drive Shaft Inspections Not Complied With".
  - (1) Wholesale Stock -N/A.
  - (2) Retail Stock - Upon receipt of this Technical Bulletin, Commanders and Facility Managers maintaining retail stock at Installation level and below shall contact the supported aviation unit to perform the procedures required in accordance with paragraphs 8 and 9 on suspect materiel. Return discrepant materiel in accordance with paragraph 10. Report compliance with this Technical Bulletin in accordance with paragraph 14d. (2).
- g. Components/Parts in Work (Depot Level and Others) - Components/Parts in Work must comply with this message before they are issued.

**2. Task/Inspection Suspense Date.** Complete the inspection in accordance with paragraph 8 prior to next flight but no later than 11 OCT 00 and report in accordance with paragraph 14b.

**3. Reporting Compliance Suspense Date.** Report compliance in accordance with paragraph 14a no later than 18 OCT 00.

**4. Summary of the Problem.**

a. A MH-47E aircraft experienced a failure of the combining transmission cooling fan drive shaft, P/N 145D5319-5. Failure of this shaft was contained by the "stove pipe". But, since the cooling fan was no longer operating, the oil temperature of the combining transmission and both engine transmissions exceeded the operating limits. This high temperature condition required landing of the aircraft as soon as possible without delay and replacement of the combining and both engine transmission. Currently there is an ongoing investigation as to the cause of the fan shaft failure.

b. For manpower/downtime and funding impacts see paragraph 12.

c. The purpose of this Technical Bulletin is to:

- (1) Remove from service those cooling fan shafts and combining transmissions found unserviceable, in accordance with this Technical bulletin.
- (2) Gather data to assist in the investigation.
- (3) Require an initial and recurring (every 100 hours) inspection of the combining transmission cooling fan drive shaft.
- (4) Require an initial and recurring (every 100 hours) inspection of the combining transmission cooling fan drive gear splines.

**5. End Items to be Inspected.** All H-47 series aircraft.

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

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
COMBINING TRANSMISSION	145D5300-21	NO NSN
COMBINING TRANSMISSION	145D5300-20	1615-01-464-3974
COMBINING TRANSMISSION	145D5300-16	1615-01-397-9921

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
COMBINING TRANSMISSION	145D5300-17	NO NSN
COMBINING TRANSMISSION	145D5300-15	NO NSN
COMBINING TRANSMISSION	145D5300-13	1615-01-310-4980
COMBINING TRANSMISSION	145D5300-12	1615-01-310-4981
COMBINING TRANSMISSION	145D5300-11	1615-01-315-9365
COMBINING TRANSMISSION	145D5300-10	1615-01-315-4069
COMBINING TRANSMISSION	145D5300-9	1615-01-312-2390
COMBINING TRANSMISSION	145D5300-5	1615-01-216-3828
COMBINING TRANSMISSION	145D5300-3	1615-01-114-0850

### 7. Parts to be Inspected. .

COOLING FAN DRIVE SHAFT P/N 145D5319-5 NSN 3040-01-310-4977

**8. Inspection Procedures.** The following inspections are required to be performed by the task/inspection suspense date of paragraph 2 and every 100 flight hours thereafter.

#### NOTE

Cooling Fan Shaft, part number 145D5319-7 is not inspectable under this SOF. Inspections, flight operations and restrictions of the -7 fan shaft are directed by safety of flight message CH-47-98-02, TB 1-1520-240-20-105, dating 16123Z.

#### NOTE

Aircraft that are away from home station or the nearest available maintenance facility are authorized a return flight to home station not to exceed 6 flight hours, not to exceed 2000 feet above ground level with no flights over water when another ground route is available even if the land route is longer in distance.

- a. Remove the fan shaft in accordance with TM 55-1520-240-23, Task 6-182 (CH-47D) or TM 1-1520-252-23, Task 6-220 (MH-47E).
- b. Using 10X magnification, visually inspect the aluminum fan shaft tube for cracks extending from under the steel adapters. No cracks are allowed. If cracks are found proceed to paragraph 9.

#### CAUTION

#### DO NOT USE TOOLS TO CHECK FOR LOOSENESS ON THE JO-BOLTS, DAMAGE TO SHAFT WILL RESULT.

- c. Inspect the jo-bolts that attach the adapters to the fan shaft tube for looseness. Attempt to turn the bolts by hand only. If the bolts can be turned by hand proceed to paragraph 9.
- d. Perform a check of the fan shaft spline wear per TM 55-1520-240-23, Task 6-182.1 (CH-47D) or TM 1-1520-252-23, Task 6-221 (MH-47E). If the spline wear exceeds 0.015 inch proceed to paragraph 9.
- e. Perform a check of the combining transmission output gear spline wear using spline wear (go/no-go) gauge, part number SK33330-018. Insert the spline wear (go/no-go) gauge into the output gear where the cooling fan shaft normally fits. If the gauge does not fit, then the transmission is serviceable. If the gauge fits into the splines of the output gear, proceed to paragraph 9.

**CAUTION**

**Torque wrench must be used during reinstallation of cooler fan drive shaft retaining shield (do not exceed 80 inch pounds). Failure to use a torque wrench will result in damage to the combining transmission.**

f. Record serial numbers of combining transmission and fan drive shaft and if possible determine the part number of the transmission cartridge assembly 145D5307-9, -7 or -5. Report this information to the logistics point of contact in paragraph 16b.

g. Reinstall fan shaft and fan in accordance with TM 55-1520-240-23, Task 6-186, (CH-47D) or TM 1-1520-252-23, Task 6-222.1 (MH-47E).

**9. Correction Procedures.**

a. The fan shaft is unserviceable if cracks are found or if the jo-bolts are found to be loose. Change the aircraft status to a red // X // and make the following entry on the 2408-13-1 "Combining transmission cooling fan shaft has loose jo-bolts. Contact the technical point of contact in paragraph 16a for disposition instructions." Submit a category I deficiency report.

b. If the fan drive shaft spline wear exceeds 0.015 inch, change the aircraft status to a red // X // and make the following entry on the 2408-13-1 "Combining transmission cooling fan shaft spline wear exceeds 0.015 inch." Contact the technical point of contact in paragraph 16a for disposition instructions. The red // X // may be cleared when the fan shaft has been replaced.

c. If the combining transmission fan drive gear fails the spline wear (go/no-go) gauge check, the combining transmission is unserviceable. Change the aircraft status to a red // X // and make the following entry on the 2408-13-1 "Combining transmission fan drive gear fails the spline wear gauge check." The red //X// may be cleared when the combining transmission has been replaced. Refer to paragraph 10d for disposition instructions.

**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) "X06", "(X-RAY-ZERO-SIX)".

**NOTE**

Project code "X06", 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.

(1) Dispose of combining transmissions removed due to spline wear using normal supply procedures. All turn-in documents must include project code (CC 57-59) "X06" (X-RAY-ZERO-SIX).

(2) Contact the technical point of contact listed in paragraph 16a for disposition of unserviceable fan shafts.

e. Disposition of Hazardous Material. N/A.

**11. Special Tools and Fixtures Required.** Go - No-Go Gauge, part number SK33330-018, national stock number 5220-01-462-1741.

**12. Application.**

a. Category of Maintenance. AVUM. aircraft downtime will be charged to AVUM. Report aircraft non-mission capable maintenance (NMCM) while undergoing inspection and correction in accordance with this Technical Bulletin.

- b. Estimated Time Required-
  - (1) For inspection-
    - (a) Total of 3 man-hours using 1 person.
    - (b) Total of 3 hours downtime for one end item.
  - (2) For replacement of combining transmission -
    - (a) Total of 50 man-hours using 5 persons.
    - (b) Total of 10 hours downtime for one end item.
- c. Estimated Cost Impact to the Field.

NOMENCLATURE	PN/NSN	QUANTITY	COST EACH	TOTAL
COOLING FAN DRIVE SHAFT	145D5319-5/ 3040-01-310-4977	1	\$5618.00	\$5618.00
COMBINING TRANSMISSION	145D5300-20/ 1615-01-464-3974	1	\$360,000.00	\$360,000.00
COMBINING TRANSMISSION	145D5300-21/ NO NSN	1	\$384,000.00	\$384,000.00

**MAXIMUM TOTAL COST PER AIRCRAFT = \$384,000.00**

- 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 – The following publications shall be changed as noted below to reflect this Technical Bulletin. A copy of this Technical Bulletin shall be inserted in the appropriate TM as authority to implement the change until the printed change is received.
  - (1) TM 55-1520-240-23, Aviation Unit and Aviation Intermediate Maintenance Manual, CH-47D Helicopter.
    - (a) Add a 100 hour inspection to Task 1-92, Operating Time Special Inspection for Aircraft on PM/PMD. The inspection requirement shall read as follows, "Inspect the combining transmission cooling fan shaft per Task 6-182.1". ULLS-A units will use this Technical Bulletin as authority to add inspection number A216 to the ULLS-A inspection master file for Task 6-182.1.
    - (b) Add a 100 hours inspection to Task 1-92, Operating Time Special Inspection for Aircraft on PM/PMD. The inspection shall require a check of the combining transmission output gear spline wear step using the spline wear (go/no-go) gauge, part number SK33330-018. ULLS-A units will use this Technical Bulletin as authority to add inspection number A217 to the ULLS-A inspection master file for combining transmission output gear spline wear.
    - (c) Revise Task 6-182.2 to incorporate the inspections listed in paragraph 8 of this SOF.
  - (2) TM 1-1520-252-23, Aviation Unit and Aviation Intermediate Maintenance Manual, MH-47E Helicopter.
    - (a) Add a 100 hour inspection to Task 1-100, Operating Time Special Inspection/Actions for Aircraft on PM/PMD. The inspection requirement shall read as follows, "Inspect the combining transmission cooling fan shaft per Task 6-221".
    - (b) Add a 100 hour inspection to Task 1-100, Operating Time Special Inspection/Actions for Aircraft on PM/PMD. The inspection shall require a check of the combining transmission output gear spline wear step using the spline wear (go/no-go) gauge, part number SK33330-018.
    - (c) Revise Task 6-221 to incorporate the inspections listed in paragraph 8 of this SOF.

**13. References.**

## TB 1-1520-240-20-129

- a. DA PAM 738-751, 15 MAR 99..
- b. TM 55-1520-240-23, Aviation Unit and Aviation Intermediate Maintenance Manual, CH-47D Helicopter.
- c. TM 1-1520-252-23, Aviation Unit and Aviation Intermediate Maintenance Manual, MH-47E Helicopter.

### 14. Recording and Reporting Requirements.

- a. Reporting Compliance Suspense Date (Aircraft). Upon entering requirements of this Technical Bulletin on DA Form 2408-13-1 on all subject MDS aircraft, Commanders will forward a priority message, datafax or e-mail to Commander, AMCOM, ATTN: AMSAM-SF-A (SOF Compliance Officer), Redstone Arsenal, AL 35898-5000, in accordance with 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 Technical Bulletin and TB number, date of entry in DA Form 2408-13-1, the aircraft mission design series and serial numbers of aircraft in numerical order.
- b. Task/Inspection Reporting Suspense Date (Aircraft). Upon completion of inspection, Commanders will forward a priority message to: Logistic point of contact, paragraph 16b. The report will cite this Technical Bulletin and TB number, date of inspection, aircraft serial number, aircraft and component hours, and results of the inspection. Inspection and reports will be completed no later than 18 OCT 00.
- c. Reporting Message Receipt (SPARES). N/A.
- d. Task/Inspection Reporting Suspense Date (SPARES).
  - (1) Materiel in Wholesale Depot Storage -. N/A.
  - (2) Materiel in Retail Storage - Commanders and Facility Managers will report compliance with this Technical Bulletin to the logistical point of contact in paragraph 16b no later than 4 OCT 00. 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 Pam 738-751, 15 Mar 99.

#### NOTE

ULLS-A users will use applicable "E" Forms.

- (1) DA Form 2408-5-1, Equipment Modification Record (Combining Transmission).
- (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 the combining transmission or fan drive shaft are removed and replaced).
- (7) DD Form 1574/DD Form 1574-1, Serviceable Tag/Label - Materiel (color yellow). Annotate remarks block with "Inspected serviceable in accordance with CH-47-00-07, TB 1-1520-240-20-129."
- (8) DD Form 1577-2/DD Form 1577-3, Unserviceable (repairable)Tag/Label - Materiel (color green). Annotate remarks block with "Unserviceable in accordance with CH-47-00-07, TB 1-1520-240-20-129."
- (9) SF Form 368, Product Quality Deficiency Report.

15. Weight and Balance. N/A.

16. Points of Contact.

a. Technical point of contact for this Technical Bulletin is Mr. Larry Wieschhaus, AMSAM-RD-AE-I-P-C, DSN 897-3341 or commercial (256) 313-3341, datafax is DSN 897-4348 or commercial (256) 313-4348. E-mail is "larry.wieschhaus@redstone.army.mil".

b. Logistical point of contact for this Technical Bulletin is Mr. William Olson, SFAE-AV-CH-L, DSN 897-3379 or commercial (256) 313-3379, datafax is 897-4348. E-mail is "william.olson@peoavn.redstone.army.mil".

c. Forms and Records point of contact for this Technical Bulletin is Ms. Ann Waldeck, AMSAM-MMC-RE-FF, DSN 746-5564 or commercial (256) 876-5564, datafax is DSN 746-4904. E-mail is "ann.waldeck@redstone.army.mil".

d. Safety Points of Contact are –

(1) Primary – Mr. Frank Rosebery (SAIC), AMSAM-SF-A, DSN 788-8631 or commercial (256) 842-8631, datafax is DSN 897-2111 or commercial (256) 313-2111. E-mail is "frank.rosebery@redstone.army.mil".

(2) Alternate – Mr. Russell Peusch, AMSAM-SF-A, DSN 788-8632 or commercial (256) 842-8632, datafax is DSN 897-2111 or commercial (256) 313-2111. E-mail is "russell.peusch@redstone.army.mil".

e. Foreign Military Sales recipients requiring clarification of action advised by this Technical Bulletin should contact CW5 Joseph L. Wittstrom, Security Assistance Management, AMSAM-SA, DSN 897-0410 or commercial (256) 313-0410. E-mail is "wittstromjl@redstone.army.mil" or Mr. Ronnie 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 "sammonsrw@redstone.army.mil". Huntsville, AL is GMT minus 5 hours.

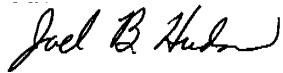
f. After hours contact the AMCOM COMMAND OPERATIONS CENTER (COC) DSN 897-2066/7 or commercial (256) 313-2066/7.

**TB 1-1520-240-20-129**

**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*  
0027702

**DISTRIBUTION:**

To be distributed in accordance with Initial Distribution Number (IDN) 313934, requirements for TB 1-1520-240-20-129.



**TB 1-1520-240-20-129**

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@avma27.army.mil>

To: <ls-lp-@redstone.army.mil>

Subject: DA Form 2028

1. **From:** Joe Smith
2. **Unit:** home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** MO
6. **Zip:** 77777
7. **Date Sent:** 19-OCT-93
8. **Pub no:** 55-2840-229-23
9. **Pub Title:** TM
10. **Publication Date:** 04-JUL-85
11. **Change Number:** 7
12. **Submitter Rank:** MSG
13. **Submitter FName:** Joe
14. **Submitter MName:** T
15. **Submitter LName:** Smith
16. **Submitter Phone:** 123-123-1234
17. **Problem: 1**
18. **Page:** 2
19. **Paragraph:** 3
20. **Line:** 4
21. **NSN:** 5
22. **Reference:** 6
23. **Figure:** 7
24. **Table:** 8
25. **Item:** 9
26. **Total:** 123
27. **Text:**

This is the text for the problem below line 27.

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.

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

# The Metric System and Equivalents

## Linear Measure

1 centimeter = 10 millimeters = .39 inch  
 1 decimeter = 10 centimeters = 3.94 inches  
 1 meter = 10 decimeters = 39.37 inches  
 1 dekameter = 10 meters = 32.8 feet  
 1 hectometer = 10 dekameters = 328.08 feet  
 1 kilometer = 10 hectometers = 3,280.8 feet

## Weights

1 centigram = 10 milligrams = .15 grain  
 1 decigram = 10 centigrams = 1.54 grains  
 1 gram = 10 decigrams = .035 ounce  
 1 dekagram = 10 grams = .35 ounce  
 1 hectogram = 10 dekagrams = 3.52 ounces  
 1 kilogram = 10 hectograms = 2.2 pounds  
 1 quintal = 100 kilograms = 220.46 pounds  
 1 metric ton = 10 quintals = 1.1 short tons

## Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce  
 1 deciliter = 10 centiliters = 3.38 fl. ounces  
 1 liter = 10 deciliters = 33.81 fl. ounces  
 1 dekaliter = 10 liters = 2.64 gallons  
 1 hectoliter = 10 dekaliters = 26.42 gallons  
 1 kiloliter = 10 hectoliters = 264.18 gallons

## Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch  
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet  
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

## Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch  
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches  
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

## Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

## Temperature (Exact)

°F Fahrenheit temperature      5/9 (after subtracting 32)      Celsius temperature      °C

**PIN: 078526-000**