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| TriskelUnited States Department of TransportationNational Highway Traffic Safety Administration | VEHICLE INSPECTION (CAPI) | Form Approved O.M.B. No. 2127-0626Expiration Date: xx/xx/xxxx Tire Pressure Monitoring System – Outage Rates and Repair Costs |

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Formatting conventions:

Questionnaire item

///PROGRAMMING LOGIC///

Explanatory notes

Programmer Notes:

* All variables are assumed to be numeric
* For SELECT ALL THAT APPLY items, create a series of variables with **\_1**, **\_2**, etc. appended to original variable name to indicate selection status of each response option
* For OTHER: SPECIFY items, create a new variable (length $ 256) with **\_OTHER** appended to original variable name to hold open-end text

Disposition Definitions:

* 61 = Completed inspection
* Create GPS variable to tag location of interview

NHTSA Form 1273

///PROGRAMMER: generate QR CODE containing MASTERID

INSPECTOR: GET INTERVIEWER TO SCAN QR CODE for ID syncing///

## MODULE 1 : ALL VEHICLES APPROACHED

///Set MASTERID to contain crew ID and timestamp to enable linking with Driver Interview///

DATE [INTERNAL]

TIME [INTERNAL]

PSUID [1-24]

CREWID [1-4]

BODY\_OBS Body type of vehicle

1. AUTO (INCLUDES SEDAN/WAGON/HATCHBACK)
2. SPORT UTILITY VEHICLE (SUV)
3. VAN (INCLUDES TRADITIONAL AND MINIVANS)
4. LIGHT TRUCK

MAKE\_OBS Make of vehicle

1. AUDI
2. BMW
3. BUICK
4. CADILLAC
5. CHEVROLET
6. CHRYSLER
7. DODGE
8. FORD
9. GMC
10. HONDA
11. HYUNDAI
12. JEEP
13. KIA
14. LEXUS
15. MAZDA
16. MERCEDES
17. NISSAN
18. RAM
19. SUBARU
20. TOYOTA
21. VOLKSWAGEN
22. VOLVO
23. OTHER: SPECIFY

98. DON’T KNOW

LANG\_OBS Language spoken

1. ENGLISH
2. SPANISH
3. OTHER

98. DON’T KNOW

AGE\_OBS Age of driver

1. YOUNG ADULT (Up to 25)
2. ADULT (25-69)
3. SENIOR (70 and over)

98. DON’T KNOW

SEX\_OBS Sex of driver

1. MALE
2. FEMALE

98. DON’T KNOW

OCCUPAD Number of ADULT occupants (if ages are unclear, count all as adult)

 /RANGE 1-10/

 98. DON’T KNOW

OCCUPCH Number of CHILD occupants (if ages are unclear, count all as adult)

 /RANGE 1-10/

 98. DON’T KNOW

DAMG\_OBS Is there damage to the vehicle?

1. NONE VISIBLE (ALLOWING FOR PAINT SCRAPES, WINDOW ISSUES, WIPER ISSUES)
2. MINOR (E.G., DENTED FENDERS/BODY PANELS)
3. MAJOR (E.G., MAJOR DAMAGE TO HOOD, FRONT END, REAR END, DOORS THAT WOULD MAKE PARTS OF VEHICLE UNUSABLE)

98. DON’T KNOW

HITCH Is the vehicle equipped with a rear hitch?

1. YES
2. NO

98. DON’T KNOW

ELEC\_OBS Is the car a hybrid or electric?

1. YES
2. NO

98. DON’T KNOW

FUEL\_OBS Fuel type purchased

1. DIESEL
2. REGULAR (GENERALLY 87 OCTANE)
3. MID-GRADE (GENERALLY 89 OCTANE)
4. PREMIUM (GENERALLY 91 OCTANE)
5. OTHER
6. NONE

98. DON’T KNOW

PAY Where was payment for fuel made?

1. AT PUMP
2. IN STORE
3. NOT APPLICABLE [ONLY ENABLED IF FUEL\_OBS=06]

98. DON’T KNOW

### END MODULE 1

SET DISPOSITION 61= “COMPLETE” IF MAKE\_OBS – BODY\_OBS IS ANSWERED IN MODULE 1 AND TPMSTAPE - EMAG IS ANSWERED IN MODULE 2

## MODULE 2: IF DRIVER IS PARTICIPATING AND 2006<=MODELYEAR<=2016

**///ASK ALL///**

**VINSCAN INSPECTOR: SCAN VIN**

PROGRAMMER: SET VINSCANSTAT=1 IF SUCCESSFUL SCAN, ELSE SET VINSCANSTAT=2

**///IF VINSCANSTAT=1 THEN SET MODELYEAR = MODELYEAR EXTRACTED FROM VIN SCAN AND VPIC ///**

///ASK IF VINSCANSTAT=2, Failed to obtain successful VIN scan ///

MY\_BPILLAR1 INSPECTOR: MANUALLY ENTER VIN

 PROGRAMMER: ALLOW 17 alpha/numeric character

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 999999999999 NOT ENTERED

**///IF MODELYEAR NOT SET YET AND MY\_BPILLAR1 <> MISSING OR <> 999999999999, SET MODELYEAR = MY\_BPILLAR1///**

**///PROGRAMMER: USE VIN TO CONNECT TO SAFERCARS.GOV TO ACCESS RECALL STATUS; SET RECALL=0 IF NO OPEN RECALLS, ELSE SET RECALL=1 IF 1+ OPEN RECALLS///**

**IND\_TPMS PROGRAMMER: SET IND\_TPMS=01 (INDIRECT TPMS VEHICLE) IF VPIC MATCHES NHTSA Table 3/Table 4, ELSE SET IND\_TPMS=02**

**//IF MODELYEAR < 2006 OR MODELYEAR > 2016//**

**INELIG INSPECTOR INFORM DRIVER: Your vehicle is not eligible for our survey.**

 **01 CONTINUE**

**//IF 2006<=MODELYEAR<=2016 AND FMVSS 138 COMPLIANT//**

**ELIG INSPECTOR INFORM DRIVER: Your vehicle is eligible for our survey.**

 **01 CONTINUE**

//ASK IF ELIG=01//

TPMSTAPE Has an attempt been made to cover up any indicator lights on the dash (e.g., with tape)?

1. YES
2. NO

///IF ELIG=01, TURN IGNITION FROM LOCK (0) TO ON (II) POSITION AND PAUSE 5 SECONDS///

TPMSON Select all TPMS-related indicator lights or readouts visibly illuminated on the dash (allowing for minor stylistic variations or differences in wording):

 [SELECT ALL THAT APPLY FROM GRAPHICAL GRID]

 ///VALIDATE: SELECTION OF “NONE VISIBLE” MEANS NO OTHER OPTIONS ARE SELECTED///

|  |  |
| --- | --- |
| 1. tire pressure monitoring system warning light icon
 | 1. C:\Documents and Settings\Charlene.Doyle\Local Settings\Temporary Internet Files\Content.Word\Santa Fe TPMS.JPG
 |
| 1. C:\Documents and Settings\Charlene.Doyle\Local Settings\Temporary Internet Files\Content.Word\Santa Fe TPMS.JPG
 | 1. C:\Documents and Settings\Charlene.Doyle\Local Settings\Temporary Internet Files\Content.Word\Safe_Braking_tpms.jpg
 |
| 1. WORDS ON DIGITAL READOUT: “CHECK {LEFT FRONT} TIRE PRESSURE”
 | 1. WORDS ON DIGITAL READOUT: “TIRE PRESSURE TOO LOW”
 |
| 1. WORDS ON DIGITAL READOUT: “TPMS SYSTEM MALFUNCTION”
 |  |
| 1. DASH OBSTRUCTED (e.g., tape, paper)
 | 1. CLEAR VIEW OF DASH, NO TPMS LIGHTS VISIBLE
 |

//ASK ALL IF ELIG=01//

WARN1 Are ANY indicator lights (other than TPMS indicators) illuminated in ON (II) position?

1. YES
2. NO

98. DON’T KNOW

///ASK ALL IF ELIG=01///

TPMSSTART TURN IGNITION FROM ON (II) TO START (III) POSITION AND PAUSE 5 SECONDS

Select all TPMS-related indicator lights or readouts visibly illuminated on the dash (allowing for minor stylistic variations or differences in wording):

 [SELECT ALL THAT APPLY FROM GRAPHICAL GRID]

 ///VALIDATE: SELECTION OF “NONE VISIBLE” MEANS NO OTHER OPTIONS ARE SELECTED;

SELECTION OF 01, 03, 05, 06, 07, 08 MEANS 02, 04, 09 CANNOT BE SELECTED AND VICE VERSA///

|  |  |
| --- | --- |
| 1. tire pressure monitoring system warning light icon SOLID
 | 1. tire pressure monitoring system warning light icon FLASHING
 |
| 1. C:\Documents and Settings\Charlene.Doyle\Local Settings\Temporary Internet Files\Content.Word\Santa Fe TPMS.JPG SOLID
 | 1. C:\Documents and Settings\Charlene.Doyle\Local Settings\Temporary Internet Files\Content.Word\Santa Fe TPMS.JPG FLASHING
 |
| 1. C:\Documents and Settings\Charlene.Doyle\Local Settings\Temporary Internet Files\Content.Word\Santa Fe TPMS.JPG
 | 1. C:\Documents and Settings\Charlene.Doyle\Local Settings\Temporary Internet Files\Content.Word\Safe_Braking_tpms.jpg
 |
| 1. WORDS ON DIGITAL READOUT: “CHECK {LEFT FRONT} TIRE PRESSURE”
 | 1. WORDS ON DIGITAL READOUT: “TIRE PRESSURE TOO LOW”
 |
| 1. WORDS ON DIGITAL READOUT: “TPMS SYSTEM MALFUNCTION”
 |  |
| 1. DASH OBSTRUCTED (e.g., tape, paper)
 | 1. CLEAR VIEW OF DASH, NO TPMS LIGHTS VISIBLE
 |

//ASK ALL IF ELIG=01//

WARN2 Are any other indicator lights (other than TPMS indicators) illuminated in START (III) position?

1. YES
2. NO

98. DON’T KNOW

* IF TPMSON NE 9 AND TPMSSTART IN 2,4,9 THEN TPMSMALF=1; indicator(s) working @ ON, system malfunction @ START
* ELSE IF TPMSON NE 9 AND TPMSSTART IN 1,3,5,6,7,8 THEN TPMSMALF=2; indicator(s) working @ ON, low pressure only @ START
* ELSE IF TPMSON=9 AND TPMSSTART=11 THEN TPMSMALF=3; no TPMS indicator(s) @ ON, no TPMS indicator(s) @ START
* ELSE IF TPMSON NE 9 AND TPMSSTART=11 THEN TPMSMALF=4; indicator(s) @ ON, no indicator(s) @ START
* ELSE TPMSMALF=5; status unclear

PROGRAMMER: TRANSFER DATA TO INTERVIEWER TABLET ALONG WITH MODELYEAR AND IND\_TPMS

INSPECTOR: If transfer does not work then communicate result to interviewer verbally or via pre-determined hand signal. DISPLAY DASH INSPECTION RESULT.

//ASK ALL IF ELIG=01//

ODOMETER Odometer reading

 /RANGE 1-1,000,000/

**//ASK ALL IF ELIG=01//**

EMAG Does the vehicle contain visible equipment that could cause electromagnetic interference (e.g., radar detector)? [Toll collection tags do NOT count as electromagnetic interference equipment]

1. YES
2. NO

///**IF IND\_TPMS=01 AND MALFCODE=02,04///**

**MANU\_TSPR VEHICLE INSPECTOR: ENTER TIRE SIZE AND PRESSURE RECOMMENDED BY MANUFACTURER; SEE DRIVER-SIDE DOOR JAMB/DRIVER-SIDE DOOR POST. If only one size is listed on the placard, then enter that size AND PRESSURE; if more than one tire size is listed on the placard, then enter all listed tire sizes AND PRESSURES on the placard.**

**PROGRAMMER: ALLOW 2 numeric characters and up to 3 tire size AND PRESSURE ENTRIES**

 **TSR\_X**

 **TPR\_X**

///**IF IND\_TPMS=01 AND MALFCODE=02,04///**

**ACT\_TS\_X VEHICLE INSPECTOR: ENTER ACTUAL TIRE SIZE THAT MOST CLOSELY MATCHES PLACARD RECOMMENDATION.**

 **PROGRAMMER: ALLOW 2 numeric characters**

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**PROGRAMMER SET REC\_TP\_X (RECOMMENDED MANUFACTURER TIRE PRESSURE) BASED ON TIRE SIZE RECORDED IN ACT\_TS\_X AND TSR\_X**

///IF IND\_TPMS=02, LOOP: X = {LF, LR, RR, RF}///

STEMCON\_X What is the condition of the valve stem on the X tire?

1. GOOD
2. POOR (E.G., CRACKED OR CORRODED)
3. NOT VISIBLE

///ASK IF STEMCON\_X = 1,2, Not missing valve stem on X tire///

STEMMAT\_X Of what material is the valve stem on the X tire made?

1. RUBBER/PLASTIC
2. METAL
3. OTHER

///ASK IF STEMCON\_X = 1,2, Not missing valve stem on X tire///

CAPCON\_X What is the condition of the valve cap on the X tire?

1. GOOD
2. POOR (E.G., CRACKED OR CORRODED)
3. NOT VISIBLE

///ASK IF CAPCON\_X = 1,2, Not missing valve cap on X tire///

CAPMAT\_X Of what material is the valve cap on the X tire made?

1. RUBBER/PLASTIC
2. METAL
3. OTHER

///ASK IF IND\_TPMS=01 AND MALFCODE=02, 04 AND REC\_TP\_X<>MISSING///

TP\_1-4

TP\_x INSPECTOR: (USING SUPPLIED TIRE PRESSURE GAUGE) MANUALLY READ THE TIRE PRESSURE FROM THE IDENTIFIED TIRE.

**PROGRAMMER: ALLOW 2 numeric characters**

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 99 NOT ENTERED

///ASK IF IND\_TPMS=01 AND MALFCODE=02, 04 AND REC\_TP\_X<>MISSING///

TEMP\_1-4

TEMP\_x INSPECTOR: (USING THE SUPPLIED PYROMETER) MANUALLY CAPTURE THE TIRE TEMPERATURE FROM THE IDENTIFIED TIRE.

**PROGRAMMER: ALLOW 3 numeric characters**

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 999 NOT ENTERED

///ASK IF TP\_X<>MISSING AND TEMP\_X<>MISSING///

TP\_ADJ\_X PROGRAMMER: Temperature Adjustment to Observed Tire Pressure

**Adjusted pressure = TP\_X - [(TEMP\_X - 65) ∗ .1]**

///ASK IF TP\_ADJ\_X<>MISSING///

TP\_SET PROGRAMMER: SET TIRE PRESSURE OF LOWEST TP\_ADJ\_X VALUE TO REPRESENT VEHICLE

///ASK IF IND\_TPMS=01 AND TP\_SET <>MISSING///

TP\_LOW INTERNAL CALCULATION TO COMPARE REC\_TP\_X AND TP\_SET.

IF ((REC\_TP\_X-TP\_SET)/(REC\_TP\_X)>=.25 THEN SET TP\_LOW=01, ELSE SET TP\_LOW=02

 PROGRAMMER: TRANSFER TP\_LOW TO INTERVIEWER TABLET

///END LOOP///

//ASK ALL IF ELIG=01//

SPARE Does the vehicle appear to have one or more spare tires (mini- or full-size) or non-matching wheels installed?

1. YES
2. NO

## END MODULE 2

## MODULE 3

/// ASK ALL///

**CHK\_RECALL1 Would you like the details of any open recalls on your vehicle?**

01 YES

02 NO

**///IF CHK\_RECALL1=01 AND RECALL=0///**

**CHK\_RECALL1A. Your vehicle has no open recall.**

**///IF CHK\_RECALL1=01 AND RECALL=1///**

**CHK\_RECALL1B. Your vehicle has an open recall. Would you like the recall information now?**

 **01 YES**

 **02 NO**

**///ASK IF CHK\_RECALL1B=01//**

**CHK\_RECALL2. PROGRAMMER: DISPLAY RECALL RESULTS**

**INSPECTOR: REPORT AND/OR DISPLAY RECALL RESULTS TO RESPONDENT; IF DISPLAY DOESN’T WORK THEN HAND DRIVER THE WALLET CARD WITH INFO ON ACCESSING RECALL DETAILS**

## END MODULE 3