

IIH Matrix Test Stand Inspection Discrepancies and Resolutions

Southwest Research 10/1/14

OHT oil pan and plug missing – Not available at the time of inspection, and has since been included.

OHT modified water pump – Was sent back to OHT for additional modification, and has since been received.

Air resonator modification within procedure specification – Procedure was since modified to allow a tolerance of ± 1 cm which brings location into conformance.

3 k Ω resistor used for ECU coolant temperature – 500 Ω resistor in parallel to increase ECU coolant temperature on test has been removed.

Intertek 10/1/14

OHT oil pan and plug missing – Not available at the time of inspection, and has since been included.

Air resonator modification within procedure specification – Procedure was since modified to allow a tolerance of ± 1 cm which brings location into conformance.

3 k Ω resistor used for ECU coolant temperature – 500 Ω resistor in parallel to increase ECU coolant temperature on test has been removed.

Lubrizol 11/5/14

Minimum 48 in of Tygon tube vertically into the Aerecology system – Length has been extended.

Ultrasonic parts cleaner and detergents not on hand – They have since been received.

3-way coolant temperature valve substitution has been found to be equivalent.

Type J thermocouples in use – Procedure has been amended to allow for either type E or J thermocouples.

Micro-motion model has found to be equivalent.

Missing throttle pedal – Procedure has been modified to allow the use of drive-by-wire as an appropriate substitution.

Afton 11/6/14

OHT crossover missing – Slave engine installed incorporated factory crossover, and has since been replaced.

Alternate coolant heat exchanger installed – Procedure has since been modified to allow for a tube and shell heat exchanger as an acceptable alternative.

Ashland 3/10/15

Minimum 48 in of Tygon tube vertically into the Aerecology system – Length has been extended.

Intake air pressure transducer ranges – Procedure has since been modified to allow for a wider selection of pressure ranges.

Type J thermocouples in use – Procedure has been amended to allow for either type E or J thermocouples.

Location of 2-way coolant control valve on wrong side of engine – Valve was re-plumbed per the coolant schematic in the procedure.

Specified Equipment & Hardware

Test Lab:

SR

Test Stand #:

64/77

Date of Inspection:

10-1-14

Equipment and Other Hardware
IIIH

Parts

Yes

No

Comments

Engine, part number 05184464AG
Phaser, Intake Fixed at 110 OHT3H-001-1
Phaser, Exhaust Fixed at 112 OHT3H-002-1
Fuel rail, using factory
Oil Pan OHT3H-304-1
Plug, E9DZ-6730-B

✓
✓ not available

Equipment and reagents

Ultrasonic parts cleaner

Ultrasonic 7 soap

Ultrasonic B

Mopar Threebond p/n 68082860AA

PCM 5150 497289

Coolant System items

Test Lab:

SR

Test Stand #:

64/77

Date of Inspection:

10-1-14

Cooling System
IIIH

Coolant System

Does the coolant system incorporate OHT3H-302-1 Crossover

Yes

No

Comments

Does the coolant system incorporate OHT3H-300-1 Modified water pump

✓

Does the coolant system incorporate OHT3H-303-1 Crossover adapter

Is the coolant system pressurized to 200 kPa

Is the 2 way control valve a Badger 9003GCW36SV3AXXL36

Does the system use a ELANCO M-71-FL Heat exchanger

Is the 3 way valve a Badger 9003TCW36SV3AXXL36

Sensotec

Is coolant pressure monitored with a 0 - 700 kPa transducer connected to the to the OHT3H-303-1 adapter

Is the coolant in temperature monitored with a type E T/C located in the modified water pump with tip in center of flow?

Is the coolant out temperature monitored with a type E T/C located in the crossover with tip in center of flow?

✓
✓
✓

OHT Bards

Coolant System Items

What type of pump is used, identify horsepower, etc

Is a micromotion R200S418NCAMEZZZZ1700113ABWMEZZZ used for flow measurement

Is a mixture of 50% Havoline Dexcool and 50% de-ionized water being used

80 GPM 3HP
Averca

63 Ave P707 tube probes

Exhaust and Fuel System

Test Lab:

SR

Test Stand #:

64/77

Date of Inspection:

10-1-14

Exhaust and Fuel System
IIIH

Exhaust

Are turndown tubes per drawing IIIH-ETP30-C installed

Yes

No

Comments

Are thermocouples installed in center of flow in left and right exhaust

Are AFR sensors and O2 sensors located properly in exhaust

ECM Nox 5210 used for AFR

Are backpressure sensors located as per TMC IIIH-ETP40-B, position 4 and do transducers have a range of 0 - 100 kPa

O2 sensor, part number 56029050AAA

Fuel

Is fuel pressure regulated to 400+/-20kPa

Is the Fuel temperature thermocouple located on the inlet side of the fuel rail

Identify the location of the Fuel pressure sensor

PL

front of engine

Remove probes -

Induction System

Test Lab: SR

Test Stand #: 64777

Date of Inspection: 10-1-14

Induction System IIIH

Induction

Yes No

Comments

Is air resonator 04861731AB installed?

Is air filter, part number 04861729AB installed?

Is air hose, part number 04861732AB utilized?

Is the air resonator configured to accept intake air temperature thermocouple and intake air pressure sensor as per Appendix A

Is the intake air temperature thermocouple a type E thermocouple

Is intake manifold pressure measured at the vacuum port on the top of the throttle body behind the throttle plate?

Is crankcase pressure measured at the dipstick tube

Does intake vacuum utilize a 0 to 100 kPa transducer

Does intake air pressure utilize a -125 Pa to 125 Pa transducer

Does crankcase pressure utilize a -125 Pa to 125 Pa transducer

GEM

Sensotec
Sensotec
Sensotec

External Oil Circuit

Test Lab:

SR

Test Stand #:

64/77

Date of Inspection:

10-1-19

Oil Control Circuit
IIIH

Oil System

	Yes	No	Comments
Is a Badger 1002GCN36SVCSALN36 used for Temperature control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is oil gallery temperature monitored with a Type E thermocouple mounted at the oil cooler inlet and matches photo in Appendix A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the oil pump temperature a type E, mounted as per Appendix A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is oil gallery pressure monitored at the oil cooler inlet and matches photo in Appendix A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the oil pump pressure monitored as per Appendix A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the oil sump temperature monitored using a Type E thermocouple inserted in the OHT3H-304-2 drain plug extending 6 mm beyond drain plug end	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Specified Equipment & Hardware

Test Lab:

1AR

Test Stand #:

91/182

Date of Inspection:

8-10-14

Equipment and Other Hardware
IIIH

Parts

→

Engine, part number 05184464AG
Phaser, Intake Fixed at 110 OHT3H-001-1
Phaser, Exhaust Fixed at 112 OHT3H-002-1
Fuel rail, using factory
Oil Pan OHT3H-304-1
Plug, E9DZ-6730-B

Yes

No

Comments

not on engine

not available
factory

Don't know if they
not inspecting
more out

Equipment and reagents

Ultrasonic parts cleaner

Ultrasonic 7 soap

Ultrasonic B

Mopar Threebond p/n 68082860AA

verified IIIH

BU

Coolant System Items

Test Lab:

EG1AR

Test Stand #:

91/182

Date of Inspection:

Cooling System
IIIH

Coolant System

Does the coolant system incorporate OHT3H-302-1 Crossover

Yes

No

Comments

not installed 182

Does the coolant system incorporate OHT3H-300-1 Modified water pump

Yes

No

Comments

Does the coolant system incorporate OHT3H-303-1 Crossover adapter

Yes

No

Comments

Does the system use a ELANCO M-71-FL Heat exchanger

Yes

No

Comments

Is the 3 way valve a Badger 9003TCW36SV3AXXL36

Yes

No

Comments

Is coolant pressure monitored with a ~~700~~ 700 kPa transducer connected to the to the OHT3H-303-1 adapter

Yes

No

Comments

Is the coolant in temperature monitored with a type E T/C located in the modified water pump with tip in center of flow?

Yes

No

Comments

Is the coolant out temperature monitored with a type E T/C located in the crossover with tip in center of flow?

Yes

No

Comments

Is a 3 k ohm resistor installed to maintain ECM coolant temperature input constant, identify the resistance

Yes

No

Comments

switched - 3K for startup - 500K for running

Remove - 500K

K is risk

Room temp 0-25 deg C

Induction System

Test Lab: 1AR

Test Stand #: 91/182

Date of Inspection: 10/10/14

Induction System IIIH

Induction *number 04861737AB*

Yes No Comments

Is air resonator 04861731AB installed? 1729AB

Is air filter, part number 04861732AB installed? 04861737AB

Is air hose, part number 04861732AB utilized?

Is the air resonator configured to accept intake air temperature thermocouple and intake air pressure sensor as per Appendix A

Is the intake air temperature thermocouple a type E thermocouple

Is intake manifold pressure measured at the vacuum port on the top of the throttle body behind the throttle plate?

Is crankcase pressure measured at the dipstick tube

Does intake vacuum utilize a 0 to 100 kPa transducer

Does intake air pressure utilize a -125 Pa to 125 Pa transducer

Does crankcase pressure utilize a -125 Pa to 125 Pa transducer

air pressure may not be Tech 182 & 91 not installed 182

open connection downstream of #115 96 only

External Oil Circuit

Test Lab:

1AR

Test Stand #:

182/91

Date of Inspection:

10-1-14

Oil Control Circuit
IIIH

Oil System

Is a Badger 1002GCN36SVCSALN36 used for Temperature control

Yes

No

Comments

Is oil gallery temperature monitored with a type E thermocouple mounted at the oil cooler inlet and matches photo in Appendix A

X

Is the oil pump temperature a type E, mounted as per Appendix A

X

Is oil gallery pressure monitored at the oil cooler inlet and matches photo in Appendix A

X

Is the oil pump pressure monitored as per Appendix A

X

Is the oil sump temperature monitored using a Type E thermocouple inserted in the OHT3H-304-2 drain plug extending 6 mm beyond drain plug end

see cell Δ

Engine Mounting and Driveline

Test Lab:

1AD

Test Stand #:

182/91

Date of Inspection:

10-19-14

Engine Mounting, Driveline Speed and Load control
IIH

Identify how the front of the engine is mounted	Yes	No	Comments
Does the rear backing plate conform to drawing IIH-EBP-20		<input checked="" type="checkbox"/>	Merc Machine Mounts
Is the flywheel part number 05184438AB?		<input checked="" type="checkbox"/>	couldn't verify
Is a solid driveshaft with 1410 u joints utilized?	<input checked="" type="checkbox"/>		
What type of dyno is utilized, make and model?	<input checked="" type="checkbox"/>		
Does the stand make use of dyno harness OHT3H-005-1?	<input checked="" type="checkbox"/>		
Does the stand make use of dyno jumper harness OHT3H-004-1?	<input checked="" type="checkbox"/>		
Is starter, part number 56029852AA, used?	<input checked="" type="checkbox"/>		428000 - 33000
Is PCM RL150588AC used to control dyno and engine functions?	<input checked="" type="checkbox"/>		
What type of load cell is utilized and is load cell temperature controlled	<input checked="" type="checkbox"/>		1182 Honeywell 3132
Is a throttle pedal part number 68043161AB utilized?	<input checked="" type="checkbox"/>		
Does the flywheel adapter match drawing IIH-FAP10-A	<input checked="" type="checkbox"/>		

PO/Parts

Way to do it

IIH Lubrizol Test Stand 341 Inspection

Exceptions to checklist provided by TMC on 10/30/14:

Page 1, Crankcase Ventilation System:

- (Comment: the LH breather does not have a OE valve)

96" to lab not 48

Page 2, Equipment and Other Hardware:

- ¹The oil pan is a lab-modified OE part that has an internal modification to displace 900mL; photo included in appendix

Page 3 -4, Cooling System:

- • The 3 way valve is a 2" Cameron TBV series, 20S-51-150- 6L36-UT201 (number is not visible); specifications are included in appendix *→ will use*

- • ²Temperature is measured with a J type TC

- • ²Coolant flow meter is Micromotion Elite Series CMF100M328NQBAEZZZ; specifications are included in appendix

Page 5, Exhaust and Fuel System:

- The turndown tubes are lab-fabricated according to prints supplied 6/24/14

Page 6, Induction system:

- ²Temperature is measured with a J type TC

Page 7, Oil Control Circuit:

- Label is not visible, my instrument group's records say it is a 1003GCN36SVCS40P36
- ²Temperature is measured with a J type TC
- The drain plug TC is installed in a lab-modified plug not the OHT part (not available)

Page 8, Engine mounting:

- ²Driveshaft is a IIG type flexible driveshaft
- Harness is supplied by OE source and does not have OHT part number on it
- Load cell is an Interface 250 lb. capacity unit (not visible)
- ²Throttle pedal is not being used, a simulator is being used as shown in appendix

¹Footnote 1: items in gray are for information only and not considered exceptions

²Footnote 2: these items were made allowable based on the meetings at SWRI and IAR

Specifications on Lubrizol's ELITE meter:

Accuracy and repeatability on liquids and slurries


Performance Specification	Standard	Optional
Mass/volume flow accuracy ⁽¹⁾⁽²⁾	±0.10% of rate	±0.05% of rate
Mass/volume flow repeatability	±0.05% of rate	±0.025% of rate
Density accuracy ⁽³⁾⁽⁴⁾	±0.0005 g/cm ³ (±0.5 kg/m ³)	±0.0002 g/cm ³ (±0.2 kg/m ³)
Density repeatability	±0.0002 g/cm ³ (±0.2 kg/m ³)	±0.0001 g/cm ³ (±0.1 kg/m ³)
Temperature accuracy	±1 °C ±0.5% of reading	
Temperature repeatability	±0.2 °C	

170 LPM = 10,200 LPH

March 2014

ELITE Series Coriolis Flow and Density Meters

Volume flow rates for stainless steel models: 304L (L), 316L (M/A), and Super Duplex (Y) (Continued)

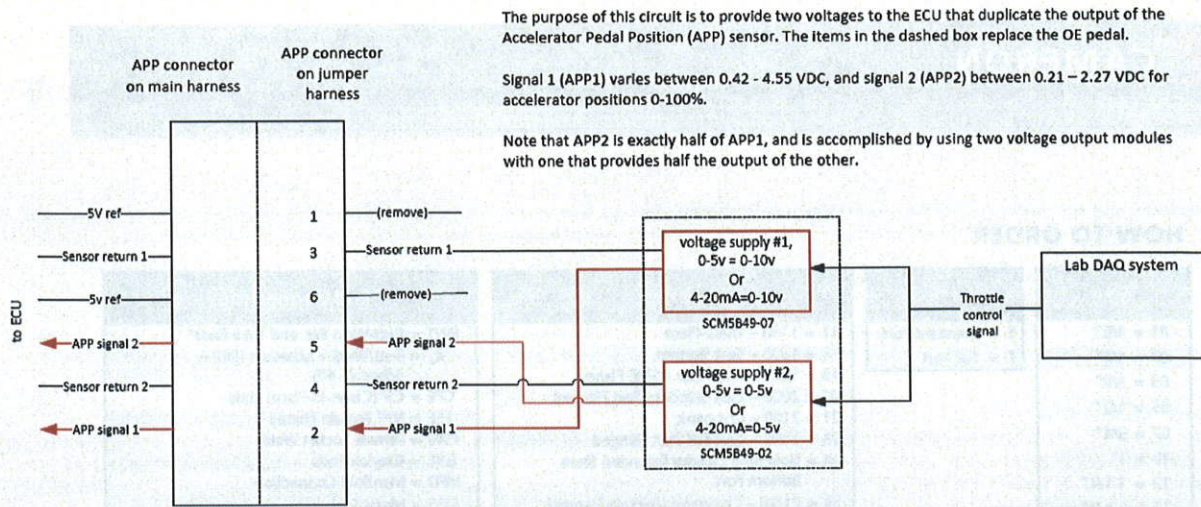
Style	Model	Nominal flow rate			Maximum flow rate		
		gal/min	barrels/h	l/h	gal/min	barrels/h	l/h
	CMF010M/L	0.411	0.587	93.5	0.475	0.678	108
	CMF025M/L	5.76	8.23	1,310	9.58	13.7	2,180
	CMF050M/L	15.2	21.7	3,460	29.9	42.7	6,800
	CMF100M/L	68.5	97.8	15,600	120	171	27,200

For reference, this is the existing specified flow meter:

Liquid flow performance

		Mass		Volume ⁽⁴⁾	
		lb/min	kg/h	gal/min	l/h
Maximum flow rate	R025S, R025P	100	2720	12	2720
	R050S	300	8160	36	8160
	R100S	1200	32,650	144	32,650
	R200S	3200	87,100	384	87,100
Mass flow accuracy ⁽²⁾	±0.5% of rate ⁽³⁾				
Volume flow accuracy	±0.5% of rate ⁽³⁾				
Mass and volume flow repeatability	±0.25% of rate ⁽³⁾				

Chrysler 3.6L Pentastar Accelerator Pedal Position Sensor (APP) simulator circuit



Dataforth model SCM5B49 has been found to be acceptable for this application when the DAQ system control signal is voltage. A SCM5B32 should be used for a current output control signal. A SCMPB04-02 will be required for either to mount the two modules. A 5VDC power supply voltage is required for this system.

<http://www.dataforth.com/model.view.aspx?modelid=103>

The minimum voltage provided through this circuit at 0% throttle (idle) should correspond to APP1= 0.42, and APP2=0.21 VDC, otherwise a "limp home" mode will be induced and the engine will be forced to 1500 rpm

2-way oil temp control valve:



Specified 3-way flow meter:

①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
9001-GC-W-36-SV-4-C-05-L-36

① VALVE SIZE

9001 - 1 inch
 9002 - 1.5 inch
 9003 - 2 inch

② BODY TYPE

GC - Globe Cast
 TC - Globe Cast Three-Way [1]

③ END CONNECTIONS

W - Wafer [NPT with Flange Face]
 F - Flanged [CL150,300 and PN16,40]
 S - Socket Weld [integral]
 B - Butt-Weld Nipples

④ BODY ASSEMBLY MATERIAL

36 - 316 SST [CF8M body, 316 SST bonnet, graphite gasket]
 AC - Alloy C [CW12-MW]
 [Consult factory for availability]

⑤ BONNET AND PACKING TYPE

SV - Standard bonnet/TFE ring packing
 SG - Standard bonnet/Graphite packing
 EV - Extended bonnet/TFE rings packing
 EG - Extended bonnet/Graphite packing
 DV - Ext. bonnet/Double TFE ring packing
 DG - Ext. bonnet/Double Graphite packing

[1] Consult factory with application data.

⑥ ACTUATOR SIZE, ACTION AND TYPE

1 - Size 35, ATO, no positioner
 2 - Size 35, ATO, with positioner
 3 - Size 35, ATC, no positioner
 4 - Size 35, ATC, with positioner
 9 - Electric Actuator

⑦ INPUT SIGNAL RANGE AND FORCE SPRING RATE

NOTE: The size 36 actuator can be equipped with either 3 or 6 springs, depending on force requirements.
 NOTE: Normally, Air To Close applications do not require 6 springs. Consult the factory if you feel you have an ATC application requiring 6 springs.

- A - 3-15 psig input, 3 springs
- B - 3-15 psig input, 6 springs
*Positioner required
- C - 6-30 psig input, 6 springs
- D - 6 psig Split Range, 3 springs
*Positioner required
- E - 6 psig range, 6 springs
*Positioner required
- F - 4-20mA DC [for Electric Actuator]

ABOUT THE MODEL NUMBER

When ordering by model number [not required by the factory], please give a description of the unit also. This will decrease the possibility of error. The model number will show on all acknowledgements, as well as the nameplate attached to the actuator. When inquiring about a valve in the field, please give the serial number and the model number from the nameplate. An [X] in any position within the model number denotes something "special".

⑧ INNERVALVE SIZE

1 INCH VALVES

Code	Cv Lin	Code	Cv=%
01	0.02	11	0.05
02	0.05	12	0.10
03	0.10	13	0.20
04	0.20	14	0.50
05	0.50	15	1.0
06	1.0	16	2.0
07	2.0	17	4.5
08	5.3	18	7.0
09	8.3		

1.5 INCH VALVES

Code	Cv Lin	Code	Cv=%
19	4.0	23	4.0
20	7.0	24	6.5
21	11.0	25	10.0
22	15.5	26	13.0

2 INCH VALVES

Code	Cv Lin	Code	Cv=%
27	7.0	31	6.5
28	15.0	32	14.0
29	21.0	33	17.0
30	25.0	34	20.0

Note: Code Q.O. innervalve sizes with Linear Cv code.

⑨ INNERVALVE CHARACTERISTIC

L - Linear
 P - Equal Percent
 Q - Quick Open

⑩ INNERVALVE MATERIAL

36 - 316 SST
 ST - 316/Stellited plug/seat
 3T - 316/TFE soft seat
 AC - Alloy C

For other innervalve materials, use 2 digit code from RCV model number list.

Crankcase Ventilation

Test Lab:

AS

Test Stand #:

1

Date of Inspection:

3-18-15

Crankcase Ventilation System
IIIH

Crankcase Ventilation

Does the system use a 3/4" Tee to connect the left and right Breathers

Yes

No

Comments

Is there a minimum of 9" of 5/8" ID Tygon tubing on the left side of the engine

reinforced

yes 45 not

Is there a minimum of 12" of 5/8" ID Tygon tubing on the right side of the engine

✓ 27"

Is there a minimum of 48" of 5/8" ID Tygon tubing on the outlet of the Tee running upward toward the air ecology unit

yes but part tube missing elbow

Have both breathers been modified to remove the valving

Specified Equipment & Hardware

Test Lab:

Test Stand #:

Date of Inspection:

Equipment and Other Hardware
IIIH

Parts	Yes	No	Comments
Engine, part number 05184464AG	/		
Phaser, Intake Fixed at 110 OHT3H-001-1			
Phaser, Exhaust Fixed at 112 OHT3H-002-1			
Fuel rail, using factory			
Oil Pan OHT3H-304-1			
Plug, E9DZ-6730-B			

Equipment and reagents

- Ultrasonic parts cleaner
- Ultrasonic 7 soap
- Ultrasonic B
- Mopar Threebond p/n 68082860AA

Test Lab:

Test Stand #:

Date of Inspection:

Induction System
IIIH

Induction

Is air resonator 04861731AB installed?

Yes /

No

Comments

~~Is air filter, part number 04861729AB installed?~~

✓

Not required

Is air hose, part number 04861732AB utilized?

/

Is the air resonator configured to accept intake air temperature thermocouple and intake air pressure sensor as per Appendix A

Is the intake air temperature thermocouple a type ~~E~~ thermocouple

/

Is intake manifold pressure measured at the vacuum port on the top of the throttle body behind the throttle plate?

/

Is crankcase pressure measured at the dipstick tube

Does intake vacuum utilize a 0 to 100 kPa transducer

0-30" Hg

Does intake air pressure utilize a -125 Pa to 125 Pa transducer

-3 + 3 in H₂O

Does crankcase pressure utilize a -125 Pa to 125 Pa transducer

External Oil Circuit

Test Lab:

AS

Test Stand #:

1

Date of Inspection:

3-10-15

Oil Control Circuit
IIIIH

Oil System

Is a Badger 1002GCN36SVCSALN36 used for Temperature control

Yes

No

Comments

Is oil gallery temperature monitored with a type 2 thermocouple mounted at the oil cooler inlet and matches photo in Appendix A

✓

5

Is the oil pump temperature a type 5 mounted as per Appendix A

✓

Is oil gallery pressure monitored at the oil cooler inlet and matches photo in Appendix A

✓

Is the oil pump pressure monitored as per Appendix A

could not verify

Is the oil sump temperature monitored using a Type 2 thermocouple inserted in the OHT3H-304-2 drain plug extending 15 mm beyond drain plug end

15

Engine Mounting and Driveline

Test Lab:

Test Stand #:

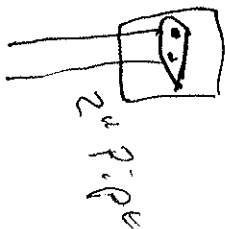
Date of Inspection:

Engine Mounting, Driveline Speed and Load control
IIIH

Identify how the front of the engine is mounted	Yes	No	Comments
Does the rear backing plate conform to drawing IIIH-EBP-20	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the flywheel part number 05184438AB?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a solid driveshaft with 1410 u joints utilized?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
What type of dyno is utilized, make and model?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Does the stand make use of dyno harness OHT3H-005-1?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Does the stand make use of dyno jumper harness OHT3H-004-1?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is starter, part number 56029852AA, used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is PCM RL150588AC used to control dyno and engine functions?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
What type of load cell is utilized and is load cell temperature controlled	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a throttle pedal part number 68043161AB utilized?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Does the flywheel adapter match drawing IIIH-FAP10-A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

210-326-0631

Kenn Fellers



MW 1014 DG (Dyng)

Strain Gauge (yes)

Test Lab: EV

Test Stand #:

CB106

Crankcase Ventilation

Date of Inspection: 11-6-14

Crankcase Ventilation System
IIIIH

Crankcase Ventilation

Yes No Comments

Does the system use a 3/4" Tee to connect the left and right Breathers

Is there a minimum of 9" of 5/8" ID Tygon tubing on the left side of the engine

Is there a minimum of 12" of 5/8" ID Tygon tubing on the right side of the engine

Is there a minimum of 48" of 5/8" ID Tygon tubing on the outlet of the Tee running upward toward the air ecology unit

Have both breathers been modified to remove the valving

Specified Equipment & Hardware

Test Lab: *EV*

Test Stand #: *CB106*

Date of Inspection: *11-6-14*

Equipment and Other Hardware
IIIH

Parts	Yes	No	Comments
Engine, part number 05184464AG	<input checked="" type="checkbox"/>		
Phaser, Intake Fixed at 110 OHT3H-001-1	<input checked="" type="checkbox"/>		
Phaser, Exhaust Fixed at 112 OHT3H-002-1			
Fuel rail, using factory			
Oil Pan OHT3H-304-1			
Plug, E9DZ-6730-B			

Equipment and reagents

Ultrasonic parts cleaner
 Ultrasonic 7 soap
 Ultrasonic B
 Mopar Threebond p/n 68082860AA

✓ ✓ also 61M20

Engine Mounting and Driveline

EV

Test Lab:

Test Stand #: CB106

Date of Inspection: 11-6-14

Engine Mounting, Driveline Speed and Load control
IIIH

	Yes	No	Comments
Identify how the front of the engine is mounted	<input checked="" type="checkbox"/>		
Does the rear backing plate conform to drawing IIIH-EBP-20	<input checked="" type="checkbox"/>		
Is the flywheel part number 05184438AB?	<input checked="" type="checkbox"/>		
Is a solid driveshaft with 1410 u joints utilized?	<input checked="" type="checkbox"/>		
What type of dyno is utilized, make and model?	<input checked="" type="checkbox"/>		MWJ 14A
Does the stand make use of dyno harness OHT3H-005-1?	<input checked="" type="checkbox"/>		
Does the stand make use of dyno jumper harness OHT3H-004-1?	<input checked="" type="checkbox"/>		
Is starter, part number 56029852AA, used?	<input checked="" type="checkbox"/>		
Is PCM RL150588AC used to control dyno and engine functions?	<input checked="" type="checkbox"/>		
What type of load cell is utilized and is load cell temperature controlled	<input checked="" type="checkbox"/>		
Is a throttle pedal part number 68043161AB utilized?	<input checked="" type="checkbox"/>		
Does the flywheel adapter match drawing IIIH-FAP10-A	<input checked="" type="checkbox"/>		

External Oil Circuit

Test Lab: *EV*

Test Stand #: *CB106*

Date of Inspection: *11-6-14*

Oil Control Circuit
IIIH

Oil System	Yes	No	Comments
Is a Badger 1002GCN36SVCSALN36 used for Temperature control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is oil gallery temperature monitored with a type E thermocouple mounted at the oil cooler inlet and matches photo in Appendix A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the oil pump temperature a type E, mounted as per Appendix A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is oil gallery pressure monitored at the oil cooler inlet and matches photo in Appendix A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the oil pump pressure monitored as per Appendix A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the oil sump temperature monitored using a Type E thermocouple inserted in the OHT3H-304-2 drain plug extending 6 mm beyond drain plug end	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Coolant System items

Test Lab: EV

Test Stand #: CB106

Date of Inspection: 11-6-14

Cooling System IIIH

Coolant System	Yes	No	Comments
Does the coolant system incorporate OHT3H-302-1 Crossover	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None built
Does the coolant system incorporate OHT3H-300-1 Modified water pump	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Does the coolant system incorporate OHT3H-303-1 Crossover adapter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the coolant reservoir tank pressurized to 200 kPa	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the 2 way control valve a Badger 9003GCW36SV3AXXL36	<input checked="" type="checkbox"/>	<input type="checkbox"/>	using tubo fishell
Does the system use a ELANCO M-71-FL Heat exchanger	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the 3 way valve a Badger 9003TCW36SV3AXXL36	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is coolant pressure monitored with a 0 - 700 kPa transducer connected to the to the OHT3H-303-1 adapter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the coolant in temperature monitored with a type E T/C located in the modified water pump with tip in center of flow?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the coolant out temperature monitored with a type E T/C located in the crossover with tip in center of flow?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is a 3 k ohm resistor installed to maintain ECM coolant temperature input constant, identify the resistance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Coolant System items

What type of pump is used, identify horsepower, etc

~~780155A~~ 180A195

348

Is a micromotion R200S418NCAMEZZZZ1700113ABMEZZZ used for flow measurement

Is a mixture of 50% Havoline Dexcool and 50% de-ionized water being used

Exhaust and Fuel System

Test Lab: *EV* Test Stand #: *CB106* Date of Inspection: *11-6-14*

Exhaust and Fuel System
IIIH

Exhaust	Yes	No	Comments
Are turndown tubes OH IIIH-ETP30-B installed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Are thermocouples installed in center of flow in left and right exhaust	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>unable</i>
Are AFR sensors and O2 sensors located properly in exhaust	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>using ECM is NOx</i>
ECM Nox 5210 used for AFR			
Are backpressure sensors located as per TMC IIIH-ETP40-B, position 4 and do transducers have a range of 0 - 100 kPa	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
O2 sensor, part number 56029050AA			
Is a probe used for exhaust gas pressure oriented to the flow			<i>unable to verify</i>

Fuel	
Is fuel pressure regulated to 400+/-20kPa	<input checked="" type="checkbox"/>
Is the Fuel temperature thermocouple located on the inlet side of the fuel rail	<input checked="" type="checkbox"/>
Identify the location of the Fuel pressure sensor	<i>Mounted on intake</i>

Crankcase Ventilation

Test Lab: *LE* Test Stand #: *341* Date of Inspection: *11-8-14*

Crankcase Ventilation System
IIH

Crankcase Ventilation	Yes	No	Comments
Does the system use a 3/4" Tee to connect the left and right Breathers	<input checked="" type="checkbox"/>		
Is there a minimum of 9" of 5/8" ID Tygon tubing on the left side of the engine	<input checked="" type="checkbox"/>		<i>13"</i>
Is there a minimum of 12" of 5/8" ID Tygon tubing on the right side of the engine	<input checked="" type="checkbox"/>		<i>15"</i>
Is there a minimum of 48" of 5/8" ID Tygon tubing on the outlet of the Tee running upward toward the air ecology unit	<input checked="" type="checkbox"/>		<i>5364</i>

Have ~~both~~ *both* breathers been modified to remove the valving
has right

Specified Equipment & Hardware

Test Lab: *LE*

Test Stand #: *341*

Date of Inspection: *11-5-14*

Equipment and Other Hardware
 IIIH

Parts	Yes	No	Comments
Engine, part number 05184464AA ✓			<i>AH</i>
Phaser, Intake Fixed at 110 OHT3H-001-1			<i>verify by</i>
Phaser, Exhaust Fixed at 112 OHT3H-002-1			<i>box</i>
Fuel rail, using factory			
Oil Pan OHT3H-304-1 ✓			
Plug, E9DZ-6730-B			

Equipment and reagents

Ultrasonic parts cleaner ✓

Ultrasonic 7 soap ✓

Ultrasonic B ✓

Mopar Threebond p/n 68082860AA

Coolant System items

Test Lab: *LE* Test Stand #: *341* Date of Inspection: *10-5-14*

Cooling System
IIIH

Coolant System	Yes	No	Comments
Does the coolant system incorporate OHT3H-302-1 Crossover	<input checked="" type="checkbox"/>		
Does the coolant system incorporate OHT3H-300-1 Modified water pump	<input checked="" type="checkbox"/>		
Does the coolant system incorporate OHT3H-303-1 Crossover adapter	<input checked="" type="checkbox"/>		<i>Jason will verify</i>
Is the coolant reservoir tank pressurized to 200 kPa	<input checked="" type="checkbox"/>		
Is the 2 way control valve a Badger 9003GCW36SV3AXXL36	<input checked="" type="checkbox"/>		
Does the system use a ELANCO M-71-FL Heat exchanger	<input checked="" type="checkbox"/>		
Is the 3 way valve a Badger 9003TCW36SV3AXXL36	<input checked="" type="checkbox"/>		
Is coolant pressure monitored with a 0 - 700 kPa transducer connected to the to the OHT3H-303-1 adapter	<input checked="" type="checkbox"/>		
Is the coolant in temperature monitored with a type E T/C located in the modified water pump with tip in center of flow?	<input checked="" type="checkbox"/>		
Is the coolant out temperature monitored with a type E T/C located in the crossover with tip in center of flow?	<input checked="" type="checkbox"/>		
Is a 3 k ohm resistor installed to maintain ECM coolant temperature input constant, identify the resistance	<input checked="" type="checkbox"/>		

Verify →

Coolant System items

What type of pump is used, identify horsepower, etc

Aucora 180A195 3hp

Is a micromotion R200S418NCAMEZZZ1700I13ABMEZZZ used for flow measurement

CFM 100 M328 NQ6EA222

Is a mixture of 50% Hayoline Dexcool and 50% de-ionized water being used

Exhaust and Fuel System

Test Stand #: _____ Date of Inspection: _____

Test Lab: _____

Exhaust and Fuel System
IIH

Exhaust	Yes	No	Comments
Are turndown tubes GM IIIH-ETP30-B installed <i>Do match</i>	✓		
Are thermocouples installed in center of flow in left and right exhaust	✓		
Are AFR sensors and O2 sensors located properly in exhaust	✓		
ECM Nox 5210 used for AFR			
Are backpressure sensors located as per TMC IIIH-ETP40-B, position 4 and do transducers have a range of 0 - 100 kPa	✓		
O2 sensor, part number 56029050AA			<i>unable to verify</i>
Is a probe used for exhaust gas pressure oriented to the flow			
Fuel			
Is fuel pressure regulated to 400+/-20kPa			✓
Is the Fuel temperature thermocouple located on the inlet side of the fuel rail			
Identify the location of the Fuel pressure sensor			<i>on rack</i>

Induction System

Test Stand #: _____ Date of Inspection: _____

Induction System
IIIH

Induction	Yes	No	Comments
Is air resonator 04861731AB installed?	/		
Is air filter, part number 04861729AB installed?	/		04861737AA
Is air hose, part number 04861732AB utilized?	/		
Is the air resonator configured to accept intake air temperature thermocouple and intake air pressure sensor as per Appendix A	/		
Is the intake air temperature thermocouple a type E thermocouple	/		
Is intake manifold pressure measured at the vacuum port on the top of the throttle body behind the throttle plate?	/		
Is crankcase pressure measured at the dipstick tube	/		
Does intake vacuum utilize a 0 to 100 kPa transducer			Druck PDCK 138 P 550
Does intake air pressure utilize a -125 Pa to 125 Pa transducer			Validyne P 550
Does crankcase pressure utilize a -125 Pa to 125 Pa transducer			11

External Oil Circuit

Test Lab:

Test Stand #:

Date of Inspection:

Oil Control Circuit
IIIH

Oil System	Yes	No	Comments
Is a Badger 1002GCN36SVCSALN36 used for Temperature control			
Is oil gallery temperature monitored with a type E thermocouple mounted at the oil cooler inlet and matches photo in Appendix A	✓		
Is the oil pump temperature a type E, mounted as per Appendix A	✓		
Is oil gallery pressure monitored at the oil cooler inlet and matches photo in Appendix A	✓		
Is the oil pump pressure monitored as per Appendix A	✓		
Is the oil sump temperature monitored using a Type E thermocouple inserted in the OHT3H-304-2 drain plug extending 6 mm beyond drain plug end			

unable to verify

Engine Mounting and Driveline

Test Lab:

Test Stand #:

Date of Inspection:

Engine Mounting, Driveline Speed and Load control
IIH

	Yes	No	Comments
Identify how the front of the engine is mounted	✓		with machine
Does the rear backing plate conform to drawing IIH-EBP-20	✓		
Is the flywheel part number 05184438AB?	✓		
Is a solid driveshaft with 1410 u joints utilized?	✓		
What type of dyno is utilized, make and model?	✓		MULTI 4
Does the stand make use of dyno harness OHT3H-005-1?	✓		
Does the stand make use of dyno jumper harness OHT3H-004-1?	✓		
Is starter, part number 56029852AA, used?	✓		
Is PCM RL150588AC used to control dyno and engine functions?	✓		combustion air
What type of load cell is utilized and is load cell temperature controlled	✓		
Is a throttle pedal part number 68043161AB utilized?	✓		
Does the flywheel adapter match drawing IIH-FAP10-A	✓		

Induction System

Test Lab: EV
Test Stand #: CB10C
Date of Inspection: 11-6-14

Induction System
IIIH

Induction	Yes	No	Comments
Is air resonator 04861731AB installed?	<input checked="" type="checkbox"/>		
Is air filter, part number 04861729AB installed?	<input checked="" type="checkbox"/>		AA
Is air hose, part number 04861732AB utilized?	<input checked="" type="checkbox"/>		
Is the air resonator configured to accept intake air temperature thermocouple and intake air pressure sensor as per Appendix A	<input checked="" type="checkbox"/>		
Is the intake air temperature thermocouple a type E thermocouple	<input checked="" type="checkbox"/>		
Is intake manifold pressure measured at the vacuum port on the top of the throttle body behind the throttle plate?	<input checked="" type="checkbox"/>		
Is crankcase pressure measured at the dipstick tube	<input checked="" type="checkbox"/>		
Does intake vacuum utilize a 0 to 100 kPa transducer	<input checked="" type="checkbox"/>		
Does intake air pressure utilize a -125 Pa to 125 Pa transducer	<input checked="" type="checkbox"/>		0 - 125
Does crankcase pressure utilize a -125 Pa to 125 Pa transducer	<input checked="" type="checkbox"/>		