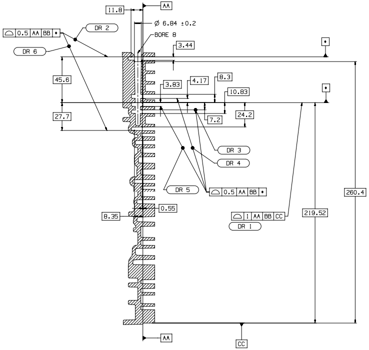
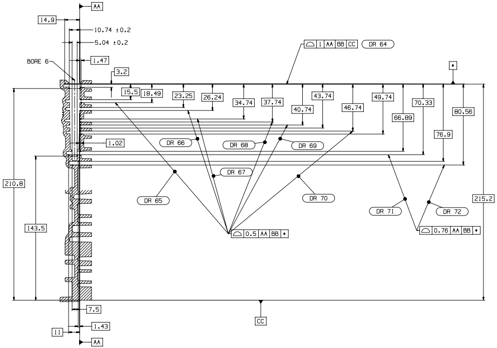
24062510

GENERAL MOTORS



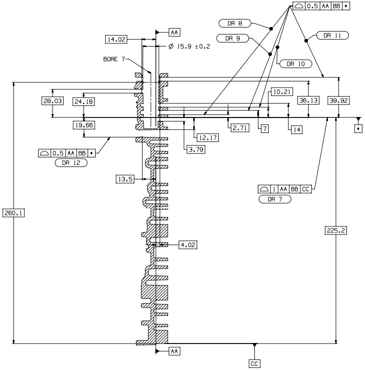
AA
11.8
Ø 6.84 ±0.2
BORE 8
3.44
DR 2
DR 6
0.5 AA BB •
45.6
27.7
3.83
4.17
8.3
10.83
7.2
24.2
DR 3
DR 4
DR 5
0.5 AA BB •
0.55
8.35
1 AA BB CC
DR 1
219.52
260.4
AA
CC

SECTION L-L
(22G)
LUBE CONTROL VALVE



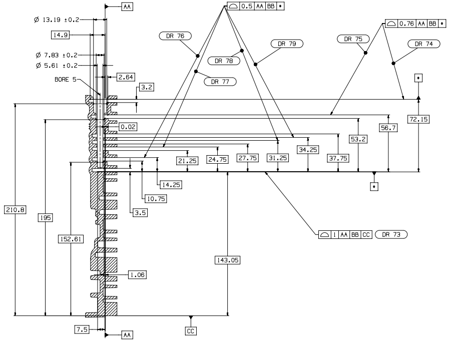
AA
14.9
10.74 ±0.2
5.04 ±0.2
BORE 6
1.47
3.2
1 AA BB CC
DR 64
15.5
18.49
23.25
26.24
34.74
37.74
40.74
43.74
46.74
49.74
66.89
70.33
76.9
80.56
1.02
DR 66
DR 68
DR 69
DR 67
DR 65
DR 70
DR 71
DR 72
0.5 AA BB •
0.76 AA BB •
210.8
143.5
215.2
7.5
1.43
11
AA
CC

SECTION S-S
(21F)
DRIVE DEFAULT SELECT VALVE



0.5 AA BB •
DR 8
DR 9
DR 10
DR 11
AA
14.02
Ø 15.9 ±0.2
BORE 7
10.21
36.13
39.92
28.03
24.18
19.66
2.71
7
14
12.17
3.79
0.5 AA BB •
DR 12
13.5
1 AA BB CC
DR 7
260.1
4.02
225.2
AA
CC

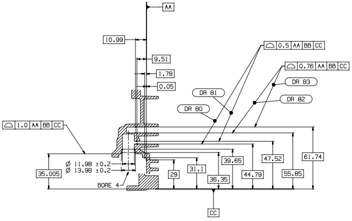
SECTION C-C
(22G)
COOLER BYPASS VALVE



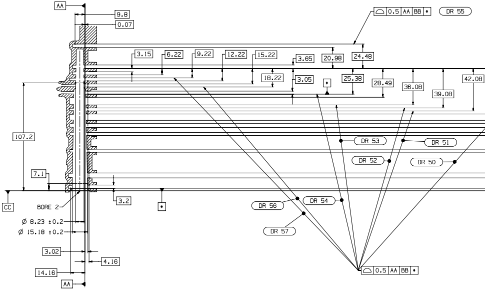
AA
0.5 AA BB •
Ø 13.19 ±0.2
14.9
Ø 7.83 ±0.2
Ø 5.61 ±0.2
BORE 5
2.64
3.2
DR 76
DR 78
DR 77
DR 79
DR 75
DR 74
0.76 AA BB •
0.02
72.15
56.7
53.2
34.25
21.25
24.75
27.75
31.25
37.75
14.25
10.75
3.5
1 AA BB CC
DR 73
210.8
195
152.61
143.05
1.06
7.5
AA
CC

SECTION E-E
(21F)
DEFAULT ENABLE VALVE

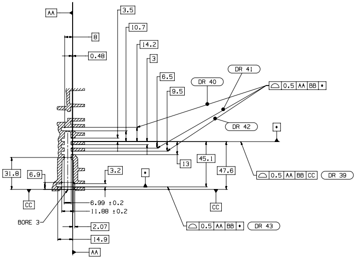
FRAME NUMBER	SHEET NUMBER	DRAWING NUMBER	DWG STATUS ST	REV	PDI
5 OF 5	1 OF 1	24062510	R	002	


AA
10.99
9.51
1.78
0.05
⌓ 0.5 AA BB CC
⌓ 0.76 AA BB CC
DR 83
DR 81
DR 82
DR 80
⌓ 1.0 AA BB CC
Ø 11.98 ±0.2
Ø 13.98 ±0.2
35.005
BORE 4
29
31.1
36.35
39.65
44.79
47.52
55.85
61.74
CC

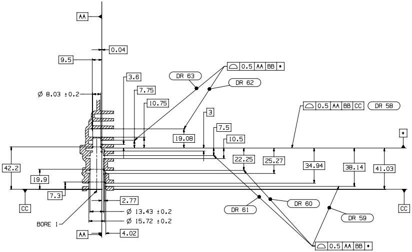
SECTION TS-TS
(21C)
TCC VFS
③


AA
9.8
0.07
⌓ 0.5 AA BB •
DR 55
3.15
6.22
9.22
12.22
15.22
3.65
20.98
24.48
18.22
3.05
•
25.38
28.49
36.08
39.08
42.08
107.2
DR 53
DR 51
DR 52
DR 50
7.1
CC
BORE 2
3.2
•
DR 56
DR 54
DR 57
Ø 8.23 ±0.2
Ø 15.18 ±0.2
3.02
4.16
14.16
AA
⌓ 0.5 AA BB •

SECTION T-T
(20C)
TCC REGULATOR CONTROL VALVE

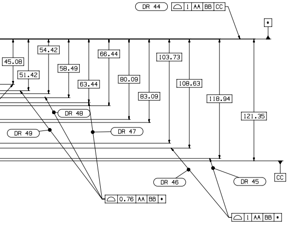

AA
3.5
10.7
8
14.2
0.48
3
6.5
DR 41
DR 40
9.5
⌓ 0.5 AA BB •
DR 42
•
13
45.1
47.6
31.8
6.9
3.2
•
⌓ 0.5 AA BB CC
DR 39
CC
6.99 ±0.2
11.88 ±0.2
CC
BORE 3
2.07
⌓ 0.5 AA BB •
DR 43
14.9
AA

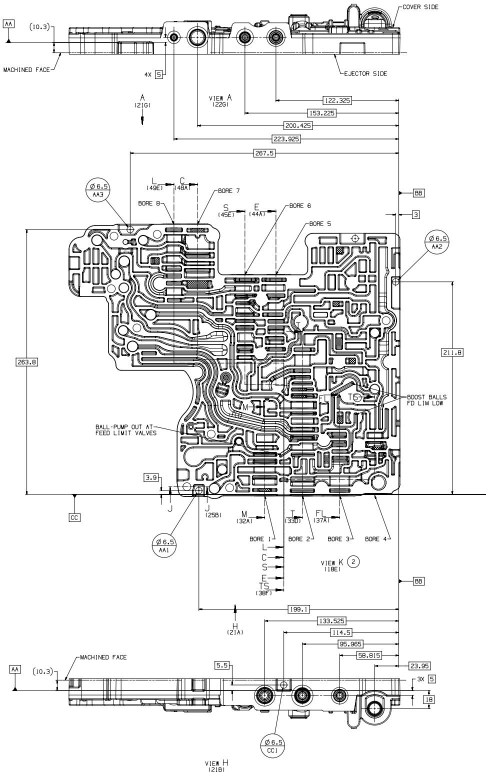
SECTION FL-FL
(20C)
FEED LIMIT VALVE (LO)
(C1 & C2)

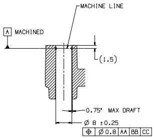

AA
0.04
9.5
⌓ 0.5 AA BB •
3.6
DR 63
DR 62
Ø 8.03 ±0.2
7.75
10.75
3
⌓ 0.5 AA BB CC
DR 58
7.5
19.08
10.5
•
42.2
22.25
25.27
34.94
38.14
41.03
19.9
7.3
CC
2.77
DR 61
DR 60
DR 59
CC
Ø 13.43 ±0.2
Ø 15.72 ±0.2
BORE 1
AA
4.02
⌓ 0.5 AA BB •

SECTION M-M
(21C)
MAIN REGULATOR VALVE

FRAME NUMBER	SHEET NUMBER	DRAWING NUMBER	DWG STATUS ST	REV	PDI
4 OF 5	1 OF 1	24062510	R	002	

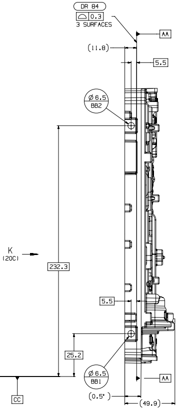

DR 44
⌓ 1 AA BB CC
45.08
54.42
51.42
58.49
63.44
66.44
80.09
83.09
103.73
108.63
118.94
121.35
DR 48
DR 49
DR 47
DR 46
DR 45
CC
⌓ 0.76 AA BB •
⌓ 1 AA BB •


AA
(10.3)
COVER SIDE
MACHINED FACE
4X 5
EJECTOR SIDE
A
(21G)
VIEW A
(22G)
122.325
153.225
200.425
223.925
267.5
Ø6.5
AA3
L
(49E)
C
(48A)
BORE 7
BORE 8
S
(45E)
E
(44A)
BORE 6
BORE 5
BB
3
Ø6.5
AA2
263.8
211.8
BOOST BALLS
FD LIM LOW
FL
TS
M
BALL-PUMP OUT AT
FEED LIMIT VALVES
3.9
J
CC
J
(25B)
M
(32A)
T
(33D)
FL
(37A)
BORE 1
BORE 2
BORE 3
BORE 4
Ø6.5
AA1
L
C
S
E
TS
(38F)
VIEW K ②
(18E)
BB
199.1
H
(21A)
133.525
114.5
95.965
58.815
23.95
MACHINED FACE
AA
(10.3)
5.5
3X 5
18
Ø6.5
CC1
VIEW H
(21B)

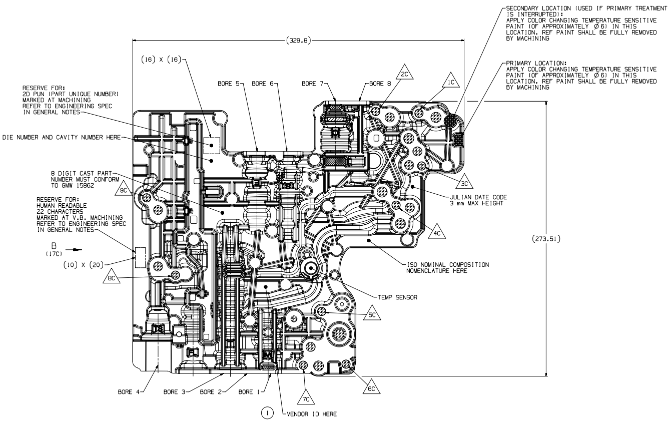

MACHINE LINE
A MACHINED
(1.5)
0.75° MAX DRAFT
Ø 8 ±0.25
⌖ Ø0.8 AA BB CC

SECTION J-J
FOR CAST BOLT HOLES: 1C - 9C
SCALE 2:1
(21C)

FRAME NUMBER	SHEET NUMBER	DRAWING NUMBER	DWG STATUS ST	REV	PDI
3 OF 5	1 OF 1	24062510	R	002	


DR 84
⌓ 0.3
3 SURFACES
AA
(11.8)
5.5
Ø6.5
BB2
K
(20C)
232.3
5.5
25.2
Ø6.5
BB1
AA
CC
(0.5°)
(49.9)

VIEW B
(16E)


(329.8)
(16) X (16)
BORE 5
BORE 6
BORE 7
BORE 8
2C
1C
RESERVE FOR:
2D PUN (PART UNIQUE NUMBER)
MARKED AT MACHINING
REFER TO ENGINEERING SPEC
IN GENERAL NOTES
DIE NUMBER AND CAVITY NUMBER HERE
8 DIGIT CAST PART
NUMBER MUST CONFORM
TO GMW 15862
9C
RESERVE FOR:
HUMAN READABLE
22 CHARACTERS
MARKED AT V.B. MACHINING
REFER TO ENGINEERING SPEC
IN GENERAL NOTES
B
(17C)
(10) X (20)
8C
SECONDARY LOCATION (USED IF PRIMARY TREATMENT
IS INTERRUPTED):
APPLY COLOR CHANGING TEMPERATURE SENSITIVE
PAINT (OF APPROXIMATELY Ø6) IN THIS
LOCATION. REF PAINT SHALL BE FULLY REMOVED
BY MACHINING
PRIMARY LOCATION:
APPLY COLOR CHANGING TEMPERATURE SENSITIVE
PAINT (OF APPROXIMATELY Ø6) IN THIS
LOCATION. REF PAINT SHALL BE FULLY REMOVED
BY MACHINING
3C
JULIAN DATE CODE
3 mm MAX HEIGHT
4C
(273.51)
ISO NOMINAL COMPOSITION
NOMENCLATURE HERE
TEMP SENSOR
5C
6C
7C
BORE 4
BORE 3
BORE 2
BORE 1
1
VENDOR ID HERE

UNLESS OTHERWISE SPECIFIED:

SCALE: 1:1

WHERE DIMENSIONS ARE SPECIFIED ON THE DRAWING, THE DRAWING IS THE AUTHORITY FOR DIMENSIONAL VALUES.

WHERE DIMENSIONS ARE NOT SPECIFIED ON THE DRAWING, THE DIGITAL MODEL IS THE AUTHORITY FOR DIMENSIONAL VALUES.

DIMENSIONS OBTAINED FROM THE DIGITAL MODEL ARE BASIC:
1. FOR RELATIONSHIPS BETWEEN FEATURES WHEN ESTABLISHED BY GEOMETRIC TOLERANCES.
2. FOR THE FORM OF A FEATURE WHEN CONTROLLED BY A PROFILE TOLERANCE.
3. FOR THE SIZE, FORM AND/OR RELATIONSHIP BETWEEN FIXED DATUM TARGETS.

DIMENSIONS OBTAINED FROM THE DIGITAL MODEL ARE ROUNDED TO TWO DECIMAL PLACES (PER IEEE/ASTM SI 10-2016)

THE DIGITAL MODEL MUST CORRESPOND TO THE RELEASE LEVEL SHOWN IN THE PART BLOCK ON THIS DOCUMENT.

MINIMUM WALL IS THE MODELED THICKNESS MINUS 0.5

A WALL IS DEFINED AS THE PARALLEL DISTANCE BETWEEN ANY TWO DIE SEGMENTS

ALL DIMENSIONS ARE RELATED TO: AA PRIMARY
BB SECONDARY
CC TERTIARY

ALL FEATURES ARE MEASURED FROM THEIR RELATIVE DATUMS

AA IS ESTABLISHED BY Ø6.5 AA1 , Ø6.5 AA2 , Ø6.5 AA3 AND BASIC DIMENSIONS

BB IS ESTABLISHED BY Ø6.5 BB1 , Ø6.5 BB2 AND BASIC DIMENSIONS

CC IS ESTABLISHED BY Ø6.5 CC1 AND BASIC DIMENSIONS

ALL DRAFT ANGLES 1°

ALL CORNER RADII TANGENT TO EJECTOR AND COVER SURFACES R0.8 MAX

ALL SOLENOID/VALVE CORE PIN DIAMETERS ALONG LENGTH OF PIN TO BE
⌖ | Ø0.75 | AA | BB | CC
⌖ | Ø0.25
CORE PIN DRAFT ANGLE 1° MAX

EXCLUDING DATUM TARGET LOCATIONS, FOR SURFACES LOCATED WITH BASIC DIMENSIONS SHOWN FROM AA, BB OR CC:

< 50		⌓ 0.5 AA BB CC
50 - 100		⌓ 0.76 AA BB CC
> 100		⌓ 1 AA BB CC

FOR SURFACES LOCATED WITH BASIC DIMENSIONS SHOWN FROM •:

< 50		⌓ 0.5 AA BB •
50 - 100		⌓ 0.76 AA BB •
> 100		⌓ 1 AA BB •

ALL CAST FEATURES NOT DIMENSIONED ARE BASIC IN THE CAD MODEL AND ARE TOLERANCED BY ⌓ 1 AA BB CC

ALL FEATURES ON COVER SIDE AS A COMPLETE UNIT TO INCLUDE ⌓ 0.5 BB CC DIE SHIFT TOLERANCE

ALL FEATURES ON COVER SIDE PARALLEL TO DATUM AA TO INCLUDE ⌓ 0.5Ⓤ0.5 AA DIE BLOW TOLERANCE

PARTING LINES ARE ALLOWED TO VARY BETWEEN CASTING SUPPLIERS FROM EJECTOR FACE TO COVER FACE WITH APPROVAL FROM GM ENGINEERING

DIE SEGMENT/INSERT SEAMLINES ALLOWED.
NO LOOSE OR ROLLED FLASH, TRIMMED WITHIN 0.4mm MAX;
LOCATIONS MUST BE APPROVED BY GM ENGINEERING

PARTING LINE FLASH TO BE TRIMMED WITHIN 0.4 MAX

GATES AND OVERFLOWS TO BE TRIMMED WITHIN 0.8 MAX

▩	INDICATES FLASH TO BE REMOVED BY VENDOR. GEOMETRY AROUND TRIM WINDOW OPTIONAL. ENGINEERING APPROVAL REQUIRED. FILLETS ADJACENT TO TRIM WINDOWS R1.5 MAX.
▦	INDICATES FLASH TO BE REMOVED BY MACHINING OPERATION. FLASH MAY OR MAY NOT BE PRESENT. AMOUNT OF FLASH TO BE AGREED UPON BETWEEN SUPPLIER AND GM MANUFACTURING.
▨	AREA IS TO BE OPENED BY MACHINING OPERATION. FLASH MAY OR MAY NOT BE PRESENT. NO FLASH IS DESIRABLE, AMOUNT OF FLASH TO BE AGREED UPON BETWEEN SUPPLIER AND GM MANUFACTURING.
⊕	INDICATES MACHINING LOCATING SURFACE. MUST BE CAST FLAT AND SMOOTH. CLAMP AND CAST DATUM TARGET SURFACES MUST BE A MAXIMUM OF 15√ AND ▱ 0.2 (DR 85) WITH ZERO DRAFT. FLASH TO BE REMOVED BY VENDOR.

HIERARCHY /QUANTITY	01 DWG ITM

FRAME NUMBER	SHEET NUMBER	DRAWING NUMBER	DWG STATUS ST	REV	PDI
2 OF 5	1 OF 1	24062510	R	002	

GM KCDS SHALL BE ADMINISTERED IN ACCORDANCE WITH THE LATEST VERSIONS OF GMW15049 AND KCDS TEMPLATES.

0	0	0	85	LAST NUMBER USED	KPC (KEY PRODUCT CHARACTERISTIC) PQC (PRODUCT QUALITY CHARACTERISTIC) AQC (ATTRIBUTE QUALITY CHARACTERISTIC) DR (DOCUMENTATION REQUIRED)
0	0	0	59	TOTAL BY COLUMN	

KPC # KPC NO.	PQC # PQC NO.	AQC # AQC NO.	DR # DR NO.	CHARACTERISTIC	RATIONALE	ZONE	SH	PLCS
			1	PROFILE FOR 219.52	FUNCTION	48F	1	1
			2	PROFILE FOR 45.6	FUNCTION	49H	1	1
			3	PROFILE FOR 7.2	FUNCTION	48G	1	1
			4	PROFILE FOR 4.17	FUNCTION	48G	1	1
			5	PROFILE FOR 3.83	FUNCTION	48F	1	1
			6	PROFILE FOR 27.7	FUNCTION	50H	1	1
			7	PROFILE FOR 225.2	FUNCTION	47C	1	1
			8	PROFILE FOR 2.71	FUNCTION	48D	1	1
			9	PROFILE FOR 7	FUNCTION	48D	1	1
			10	PROFILE FOR 10.21	FUNCTION	47D	1	1
			11	PROFILE FOR 39.92	FUNCTION	47D	1	1
			12	PROFILE FOR 19.66	FUNCTION	49C	1	1
			39	PROFILE FOR 49.7	FUNCTION	34B	1	1
			40	PROFILE FOR 14.2	FUNCTION	35C	1	1
			41	PROFILE FOR 6.5	FUNCTION	35C	1	1
			42	PROFILE FOR 9.5	FUNCTION	35C	1	1
			43	PROFILE FOR 45.1	FUNCTION	35B	1	1
			44	PROFILE FOR 121.35	FUNCTION	27G	1	1
			45	PROFILE FOR 118.94	FUNCTION	26E	1	1
			46	PROFILE FOR 108.63	FUNCTION	27E	1	1
			47	PROFILE FOR 63.44	FUNCTION	27F	1	1
			48	PROFILE FOR 58.49	FUNCTION	28F	1	1
			49	PROFILE FOR 51.42	FUNCTION	28F	1	1
			50	PROFILE FOR 45.08	FUNCTION	29F	1	1
			51	PROFILE FOR 42.08	FUNCTION	29F	1	1
			52	PROFILE FOR 39.08	FUNCTION	30F	1	1
			53	PROFILE FOR 36.08	FUNCTION	30F	1	1
			54	PROFILE FOR 25.38	FUNCTION	30E	1	1
			55	PROFILE FOR 24.48	FUNCTION	29G	1	1
			56	PROFILE FOR 18.22	FUNCTION	31E	1	1
			57	PROFILE FOR 9.22	FUNCTION	31E	1	1
			58	PROFILE FOR 41.03	FUNCTION	29C	1	1
			59	PROFILE FOR 38.14	FUNCTION	30B	1	1
			60	PROFILE FOR 22.25	FUNCTION	30B	1	1
			61	PROFILE FOR 7.5	FUNCTION	31B	1	1
			62	PROFILE FOR 19.04	FUNCTION	31C	1	1
			63	PROFILE FOR 7.75	FUNCTION	31C	1	1
			64	PROFILE FOR 215.2	FUNCTION	42H	1	1
			65	PROFILE FOR 18.49	FUNCTION	44F	1	1
			66	PROFILE FOR 26.24	FUNCTION	44G	1	1
			67	PROFILE FOR 34.74	FUNCTION	43G	1	1
			68	PROFILE FOR 37.74	FUNCTION	43G	1	1
			69	PROFILE FOR 40.74	FUNCTION	42G	1	1
			70	PROFILE FOR 46.74	FUNCTION	42F	1	1
			71	PROFILE FOR 70.33	FUNCTION	42F	1	1
			72	PROFILE FOR 80.56	FUNCTION	41F	1	1
			73	PROFILE FOR 143.05	FUNCTION	41B	1	1
			74	PROFILE FOR 72.15	FUNCTION	41D	1	1
			75	PROFILE FOR 56.7	FUNCTION	42D	1	1
			76	PROFILE FOR 14.25	FUNCTION	43D	1	1
			77	PROFILE FOR 24.75	FUNCTION	43D	1	1
			78	PROFILE FOR 31.25	FUNCTION	43D	1	1
			79	PROFILE FOR 34.25	FUNCTION	42D	1	1
			80	PROFILE FOR 44.79	FUNCTION	37G	1	1
			81	PROFILE FOR 47.52	FUNCTION	37G	1	1
			82	PROFILE FOR 55.86	FUNCTION	36G	1	1
			83	PROFILE FOR 61.73	FUNCTION	36G	1	1
			84	PROFILE FOR DATUM AA	FUNCTION	18G	1	1
			85	FLATNESS FOR CAST DATUMS	FUNCTION	8A	1	1

ZONE	DWG STATUS DATE	ST	REV	POS	PDI	REVISION HISTORY	AUTH	DR	APVD 1	APVD 2	APVD 3	APVD 4	APVD 5
	08AP24	R	001			RELEASED TO PRODUCTION AT DLS A DESIGN HISTORY REFERENCE: 24050241	BZ88K	RK	DTV	PON	JF RT	JG BR	JVH
14C	21JN24	R	002	1		CROSSHATCH REVISED IN PRINCIPLE VIEW							
20C				2		CROSSHATCH REVISED IN VIEW K							
38E				3		SECTION VIEW FH-FH RENAMED TS-TS	C3M9G	SF	PH JP	PK IX	JH	BR	JF

MATERIAL:
ASTM-B85 GRADE A383 / GLOBALLY EQUIVALENT
JIS-H5302-GRADE-ADC12Z

SHOT BLAST REQUIRED 100% OF SURFACE AREA OR THAT WHICH IS MUTUALLY AGREEABLE

MAX SHOT SIZE S550 (2.38)

PARTS MUST BE FREE FROM BURRS AND SHARP EDGES, WHICH MIGHT BE DETRIMENTAL TO SATISFACTORY ASSEMBLY, SAFE HANDLING OR FUNCTION OF PART

PARTS AS DELIVERED TO MACHINING/ASSEMBLY SHALL BE CLEAN AND FREE OF DEBRIS, RESIDUAL ABRASIVE MATERIAL, AND CORROSION PRODUCTS ADVERSELY AFFECTING FUNCTION OR APPEARANCE. CLEANLINESS IS VERIFIED BY VISUAL EVALUATION.

REFER TO 24050249 FOR POROSITY ACCEPTANCE STANDARDS AND 2D PUN MATRIX

FOR SPECIFICATION AND INTERPRETATION OF KCDS BLOCK AND DRAWING SYMBOLS, SEE GM GLOBAL KCDS STANDARD GMW15049 AND GENERAL MOTORS PROCEDURE ETQ-114.

HEAT TREAT:

STRESS RELIEF: 225° C-275° C
FOR 45 MINUTES MINIMUM

STRESS RELIEF PROCESS AND EQUIPMENT MUST COMPLY CQI-9 REQUIREMENTS. THE MANUFACTURING SITE SHALL DOCUMENT, MAINTAIN AND RETAIN PROCESS CONTROL PLANS AND PROCESS CONTROL DATA. PROCESS CONTROL DATA FOR THESE CHARACTERISTICS SHALL BE RETAINED IN A RECOVERABLE FORMAT FOR A MINIMUM OF 3 YEARS, AVAILABLE TO GM UPON REQUEST. IF READINGS ARE OBTAINED OUTSIDE THE SPECIFICATION AN APPROPRIATE REACTION PLAN SHALL BE INITIATED FROM THE CONTROL PLAN.

ZONE	DWG RLTN SHIP	PART NUMBER	DLS	REV LVL	PDI	CALC MASS (kg)	PART NAME	COMMENT
	RD	24062510	A	002		2.4169	BODY-C/VLV UPR (CSTG)	

PARTS SHOWN ON DRAWING

FRAME NUMBER 1 OF 5

ADDITIONAL GM APPROVERS		DATE:
APVD7	JEREMY V HORGAN	18MR24
APVD8	BLAKE RHYNARD	15MR24

VIEWS AND SECTIONS ON THIS DRAWING ARE IN ACCORDANCE WITH GM S1100-2

RESTRICTED AND REPORTABLE SUBSTANCES FOR PARTS PER GMW3059

THIS DOCUMENT IS IN ACCORDANCE WITH ASME Y14.5-2018 AS AMENDED BY THE GM GLOBAL DIMENSIONING AND TOLERANCING ADDENDUM-2020 (GMW16812)

CHANGE RESTRICTED
NO MANUAL CHANGES

FOR FURTHER DRAFTING STANDARDS SEE GM S1100

METRIC

DIMENSIONS SHOWN IN MILLIMETERS UNLESS OTHERWISE SPECIFIED

REFERENCE
ABIV ETRS
HL106356, HL107421
HL106539, HL107419
HL106063, HL107422
HL106064, HL107423
HL107296, HL107424
HL107293, HL107420
HL106060, HL107294

		DATE
DRAFTER	RAVIKRISHNA L G	27DE23
APVD1	DEEPAK T V	22FE24
APVD2	PONSEENI R KUMAR	03AP24
APVD3	JASON FISHER	22MR24
APVD4	ROBERT THOMAS	15MR24
APVD5	JOEL GUNDERSON	03AP24

DRAWING NAME
BODY-C/VLV UPR (CSTG)

SIZE	DRAWING NUMBER	DWG STATUS ST	REV	PDI	SHEET NUMBER
R	24062510	R	002		1 OF 1

24062510