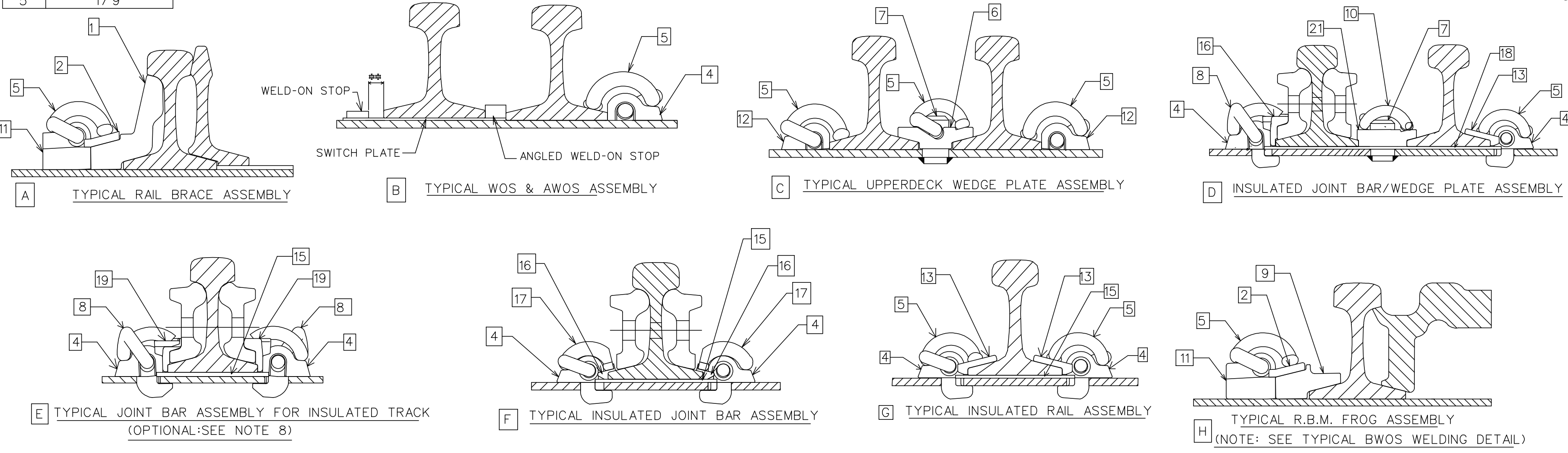
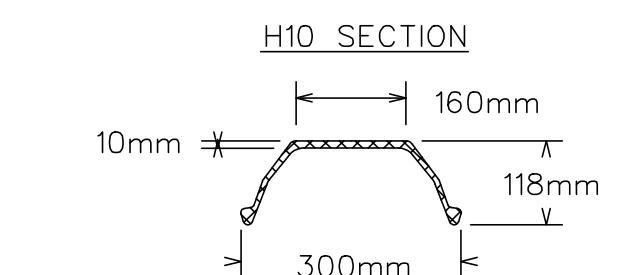


ROD	POSITION FROM POINT OF SWITCH
1	1'5"
2	3'0"
3	6'8"
4	12'2"
5	17'9"



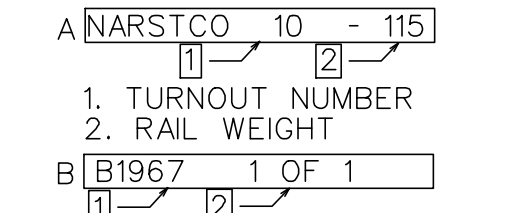
- NOTE:**
- TRANSITION TIES ARE FLAT SEAT DESIGN (NO CANT) REF. GTS-2106.
  - LABELS A, B & C AFFIXED TO TOP TIE IN EVERY BUNDLE ONLY.
  - TO AVOID VARIANCE IN RAIL GAUGE, DUE TO RAIL HEAD TO BASE ECCENTRICITY, ENSURE THAT THE RAIL BRAND OF ALL RAILS FACES IN THE SAME DIRECTION.
  - a. UNIFORM RISER PLATE THICKNESS:
    - 1/4" FOR TIES 2 TO 15
    - 3/16" FOR TIE 16
    - 1/8" FOR TIE 17
    - 1/16" FOR TIE 18
  - b. UNIFORM RISER PLATES SHALL CONFORM WITH LATEST ISSUES OF ASTM A36.
  - TIES WILL BE PUNCHED FOR 7/8" DIA. INSPECTION HOLES, LOCATION VARIES WITH RAIL POSITION.
  - POINT AND FROG AREA TIES ARE NARSTCO PATENTED INSULATED MULTI-STACK DESIGN. NARSTCO PATENT NO.7731099.
  - USE OFF-SET RAIL PADS IN RAIL SEATS FOR TIES WITH HOLES PUNCHED OFF CENTER, (TIES 20, 21 & 56)
  - JOINT BARS SHOULD BE USED AS NECESSARY, JOINTS CAN BE WELDED TO PRODUCE CONTINUOUS RAIL IF REQUIRED.
  - ADJUSTABLE MJ CLIPS WITH VERTICAL SWITCH RODS SHOULD BE USED IN CHANNEL TIES.
  - HEELS ARE FLOATING AND POINTS ARE EXTENDED POINT LENGTHS ARE 31'6".
  - WELD ON STOPS ARE USED ON THE FOLLOWING TIES FOR POINT FLEX (SEE DETAIL B):
    - \*\*\*3/4" FOR TIE 16
  - TIES 60-70 ARE 15' OR OVER IN LENGTH.
  - TRANSITION TIES NOT INCLUDED IN TURNOUT PACKAGE.
  - HEADBLOCK TIES ARE FIELD-DRILLED TO ACCEPT POWER OR MANUAL SWITCH STANDS.
  - ⊙ =MECHANICAL JOINT LOCATIONS TO BE FIELD WELDED OR REMAIN AS STANDARD JOINTS AS DIRECTED BY METROLINX.
  - ⊠ =INSULATED JOINT LOCATIONS TO BE INSTALLED WHEN TRACK CIRCUITS EXIST OR ARE REQUIRED AND SHALL BE THE CONTINUOUS GLUED TYPE WITH THE INSULATED JOINT UNDRILLED (BLANKED) RAIL ENDS FIELD WELDED.



**SECTION PROPERTIES**  
 WEIGHT OF BAR: 30.8kg/m  
 YIELD STRENGTH: 345MPa (min)  
 SECTION MODUL I: Z TOP-153 X 10<sup>3</sup> mm<sup>3</sup>  
 : Z BOT-79.7 X 10<sup>3</sup> mm<sup>3</sup>

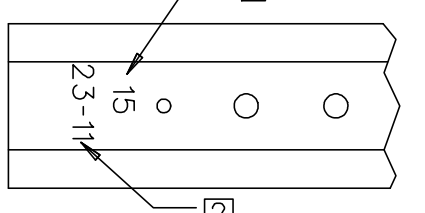
- IN PRACTICE:**
- LOCATE 8017 FROG CLAMP AS SHOWN IN DETAIL
  - PLACE BWOS AGAINST FROG CLAMP ON TIE CENTER
  - TRACK WELD BWOS IN PLACE
  - USING 7018 WELDING ROD, 3/16" OR BIGGER, PLACE 1/2" FILLET WELD ON OUTSIDE EDGES OF BWOS
  - DRIVE 8017 FROG CLAMP IN FROM RIGHTHAND SIDE
  - INSTALL SERRATED WASHER AND THEN CLIP
  - FOR MORE DETAILED INSTRUCTIONS, SEE S.O.P MG 045

**TIE BUNDLE LABEL FORMAT**

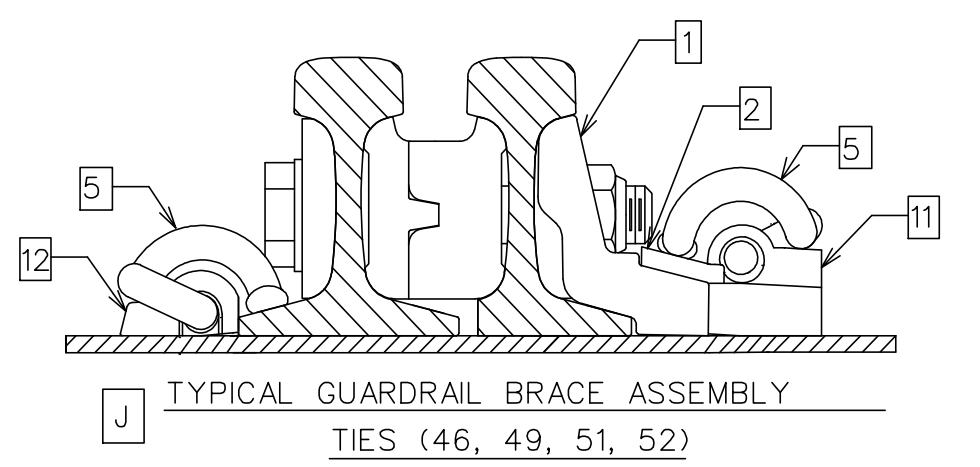
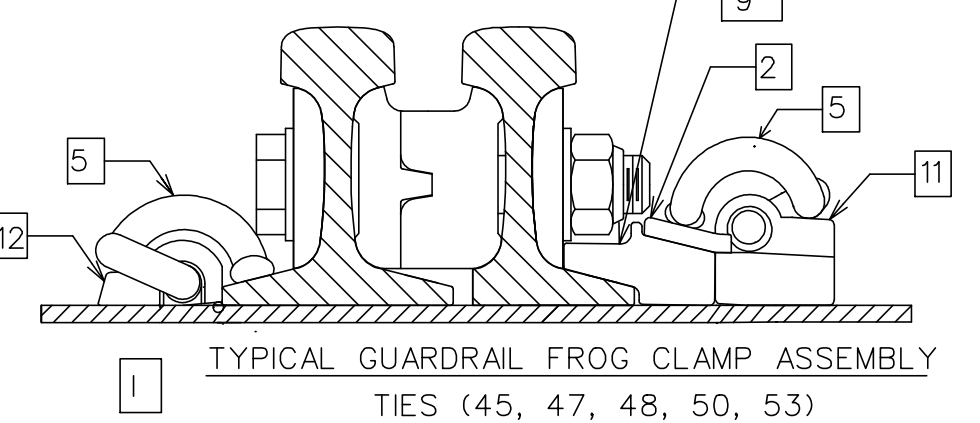


- BATCH NO. FOR QUALITY ASSURANCE IDENTIFICATION
- SEQUENTIAL NUMBER IN BATCH
- SEPTEMBER 2018
1. MONTH PRODUCED
2. YEAR PRODUCED

**TIE MARKINGS**



- TIE NUMBER
- DISTANCE FROM CENTERLINE OF FIRST TIE



TURNOUT DATA			
FROG R.B.M.	NUMBER	10	
	ANGLE	TOE	5°43'29"
		HEEL	12'0"
		TOTAL	26'0"
SPREAD	TOE	1'5 53/64"	
	HEEL	1'5 11/32"	
SWITCH	LENGTH	23'2"	
	HEEL SPREAD	6 1/4"	
	ANGLE	0°27'58"	
	VERTEX DISTANCE	0"	
	THROW	4 3/4"	
TURNOUT	ACTUAL LEAD	81'6 1/2"	
	CURVE ON CENTER LINE	DEGREE	7°06'09"
		RADIUS	807.2'
	CLOSURE LENGTH	STRAIGHT	46'4 1/2"
		CURVED	46'6 9/32"
	ACTUAL LENGTH	STRAIGHT	38'0 1/2"
CURVED		38'1 25/32"	
TRACK GAUGE	4'8 1/2"		

**METRIC CONVERSION: 1 inch=25.4mm, 1 foot=304.8mm**

0	19/03/15	DWG VERSION ESTABLISHED
No.	Date	Revision
		By Approved

Standard / GO TRANSIT #10-115b INS CT SPP PS  
 UNIFORM FLHL RBM 13' GUARD RAIL

Drawn MR. C Checked GWM Approved VP Engineering & Asset Management



Date MAR 15/2019 Plan Number GTS-2708 Rev 0

## BILL OF MATERIALS FOR GTS-2708

ITEM	DESCRIPTION	NARSTCO PART NO.	QTY
<b>TURNOUT COMPONENT</b>			
1	ADJUSTABLE RAIL BRACE	8014	18
2	RAIL BRACE SERRATED WASHER	8015	46
3#	RAIL BRACE HOOK-IN SHOULDER	8016	116
4	NARSTCO HOOK-IN SHOULDER	4010	330
5	'e' CLIP ('e' TYPE CLIP)	'e' CLIP	568
6	STEEL WEDGE PLATE	17S,17T,18S, 18T	4
7*	WEDGE PLATE PIN	17, 18, 19	6
8	'J' CLIP	NJ1	32
9	FROG CLAMP (R.B.M.)	8017	26
10	L/H 'e' CLIP	Ne2	5
11*	RAIL BRACE WELD-ON SHOULDER	BWOS	46
12*	WELD-ON SHOULDER	WOS	70
13	INSULATOR	HD-10	446
14	OFFSET INSULATING PAD 5 1/2"	3020	10
15	NARSTCO INSULATING PAD 5 1/2"	IN-0030	152
16	INSULATED JOINT INSULATOR	J7819	8
17	INSULATED JOINT CLIP	e2063	8
18	CUSTOM INSULATOR PAD	19, 55	3
19	JOINT BAR INSULATOR	N8J-HD	32
20^	FROG CLAMP (S.M.S.G)	8018	2
21	NYLON JOINT WEDGE PLATE	19S, 19T	2

### GO TRANSIT REFERENCES

PLAN #	TITLE
GTS-0002A-REV1	GEOMETRY FOR NO. 10 ALL WELDED TURNOUTS
GTS-0282-REV1	NO. 10 TURNOUT 31'6" POWER OPERATED-SAMSON P.T SWITCH UNIFORM RISER DESIGN-ALL WELDED RAIL RBM FROG 115LB. R.E. RAIL-WOOD TIES
GTS-1125	GUARD RAILS TEE RAIL DESIGN WITH PLANED FLARES AND FLAT PLATES

### VOESTALPINE NORTRAK REFERENCES

PLAN #	TITLE
D10948	NO.10-115LB RBM FROG

### WESTERN CULLEN HAYES REFERENCES

7ST235R-19-20	SWITCH POINT GUARD FOR CHANNEL TIE RIGHT HAND
7ST235L-19-20	SWITCH POINT GUARD FOR CHANNEL TIE LEFT HAND

### FROG CLAMP (AFC) & RAIL BRACE (ARB) LOCATION FOR GUARD RAILS

TIE NUMBER	45	46	47	48	49	50	51	52	53
THROUGH RAIL	AFC	ARB	AFC	AFC	ARB	AFC	ARB	ARB	AFC
TURNOUT RAIL	AFC	ARB	AFC	AFC	ARB	AFC	ARB	ARB	AFC

### LEGEND

- \* WELDED TO TIE DURING MANUFACTURING
- # INSTALLED ON TIE DURING MANUFACTURING
- ^ TO BE INSTALLED ON SWITCH POINT PROTECTOR