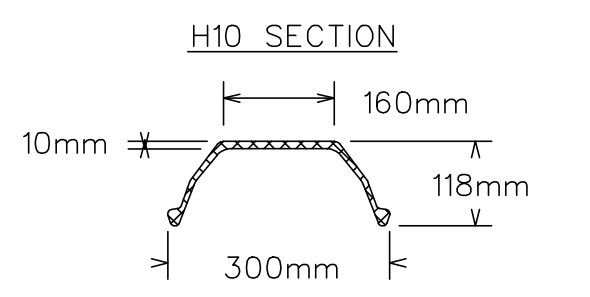
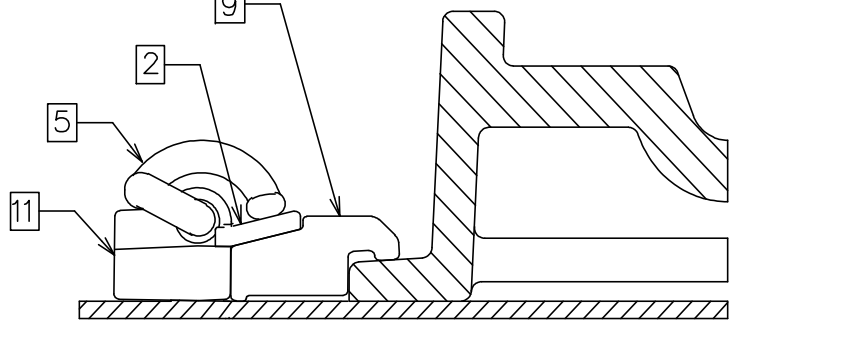
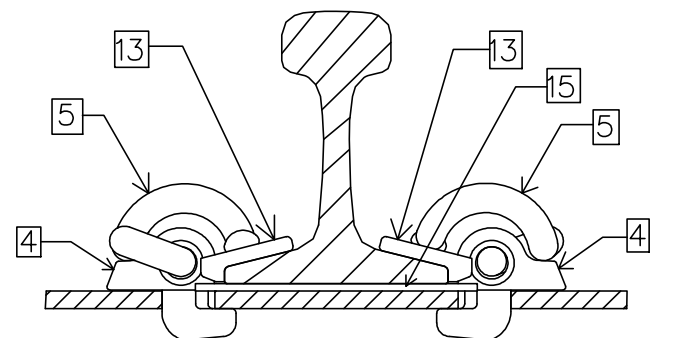
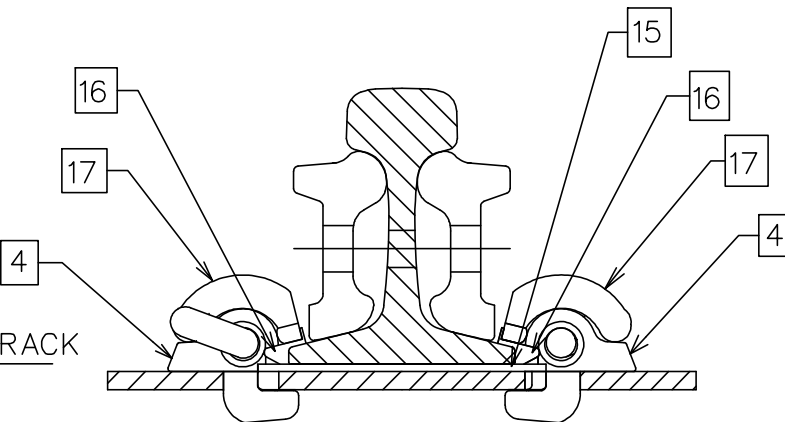
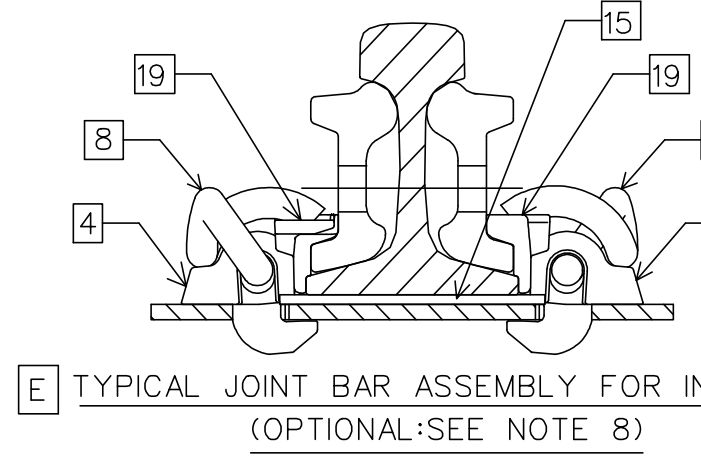
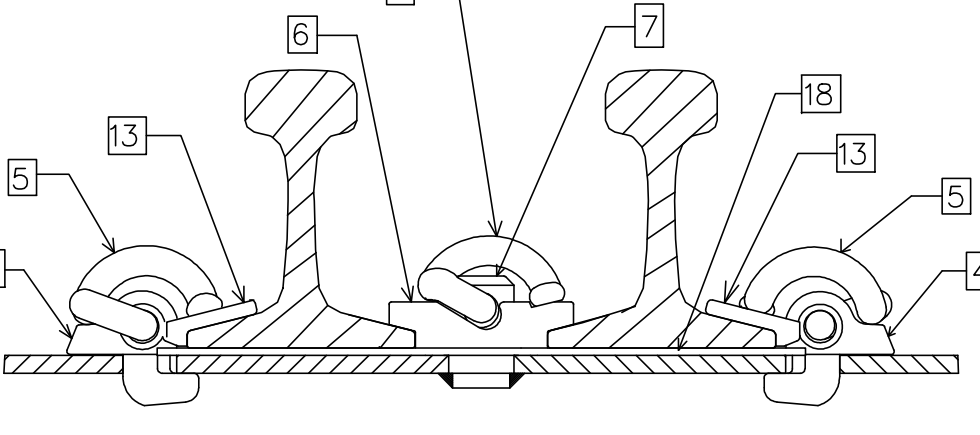
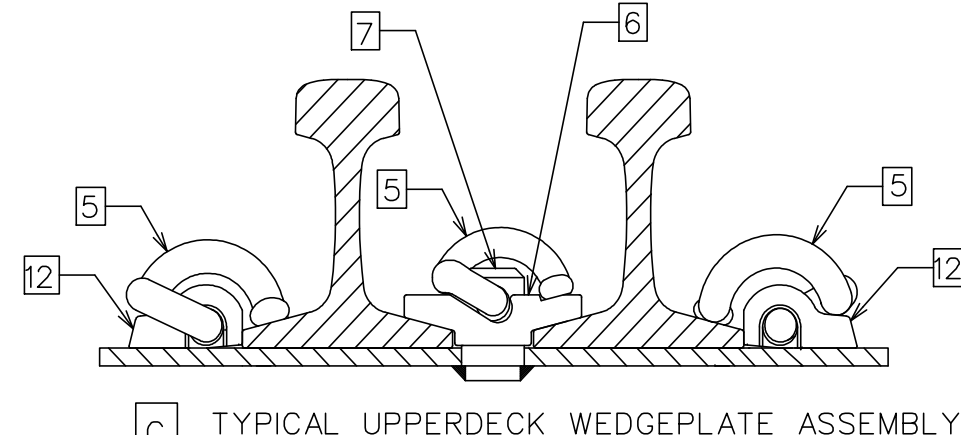
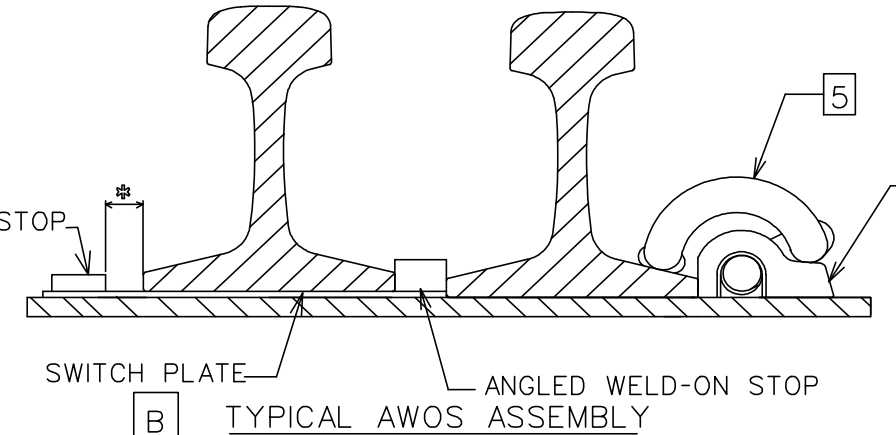
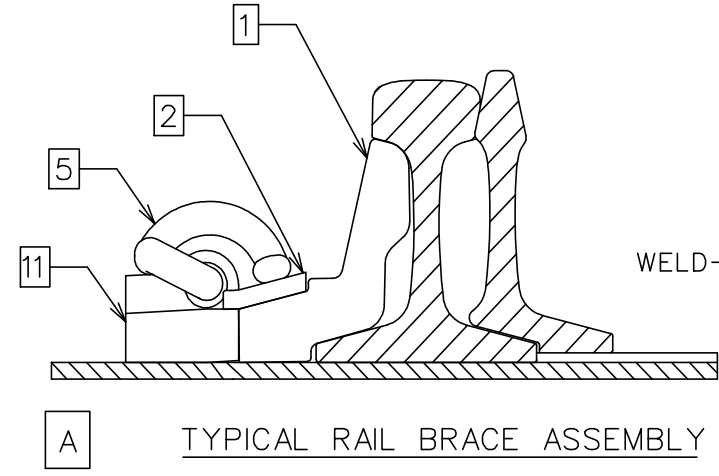
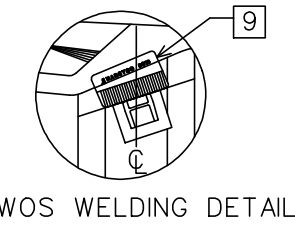


ROD	POSITION FROM POINT OF SWITCH
1	1'-5"
2	4'-6"



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

IN PRACTICE:  
 - LOCATE 8018 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 8018 FROG CLAMP IN FROM RIGHTHAND SIDE  
 - INSTALL SERRATED WASHER AND THEN CLIP  
 - FOR MORE DETAILED INSTRUCTIONS, SEE S.O.P MG 045



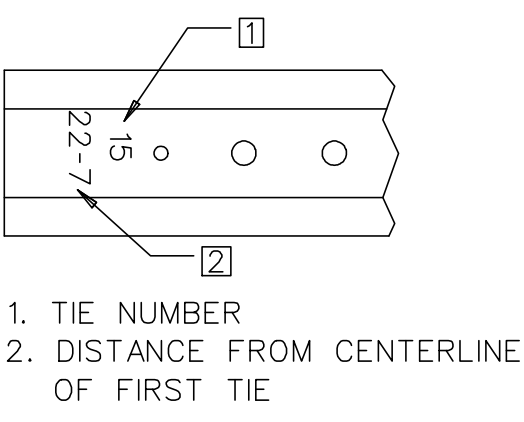
TIE BUNDLE LABEL FORMAT

A NARSTCO 10 - 115  
 1. TURNOUT NUMBER  
 2. RAIL WEIGHT

B 1967 1 OF 1  
 1. BATCH NO. FOR QUALITY ASSURANCE IDENTIFICATION  
 2. SEQUENTIAL NUMBER IN BATCH

C SEPTEMBER 2018  
 1. MONTH PRODUCED  
 2. YEAR PRODUCED

TIE MARKINGS



- 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 12
    - 3/16" FOR TIE 13
    - 1/8" FOR TIE 14
    - 1/16" FOR TIE 15
  - 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 18, 19, 45 & 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 38'5".
  - WELD ON STOPS ARE USED ON THE FOLLOWING TIES FOR POINTS FLEX (SEE DETAIL B):
    - 3/4" FOR TIE 13
  - TIES 60-70 ARE 15' OR OVER IN LENGTH.
  - TRANSITION TIES NOT INCLUDED IN TURNOUT PACKAGE.
  - IF ZERO POINT SWITCH POINTS ARE USED, A NOMINAL 3/8" WIDE GAUGE WILL OCCUR AT THE POINT OF SWITCH AND WILL TAPER BACK TO STANDARD GAUGE THROUGH THE SWITCH AREA BEFORE THE HEEL.
  - 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.

TURNOUT DATA			
FROG S.M.S.G.	NUMBER	10	
	ANGLE	TOE	5°43'29"
		HEEL	3'9"
LENGTH	TOTAL	11'4 1/2"	
	HEEL SPREAD	6 1/4"	
SPREAD	TOE	4"	
	HEEL	9 21/32"	
TANGENT ADJACENT TO TOE OF FROG	TANGENT ADJACENT TO HEEL OF SWITCH	2'10 1/2"	
	LENGTH	4'8 1/8"	
SWITCH	HEEL SPREAD	16'6"	
	ANGLE	1°42'01"	
TURNOUT	VERTEX DISTANCE	1'0 5/8"	
	THROW	4 3/4"	
CURVE ON CENTER LINE	ACTUAL LEAD	81'6 1/2"	
	DEGREE	7°44'25"	
CLOSURE LENGTH	RADIUS	740'9 1/2"	
	STRAIGHT	61'3 1/2"	
ACTUAL LENGTH	CURVED	61'5 5/16"	
	STRAIGHT	39'4 1/2"	
TRACK GAUGE	CURVED	39'6 5/16"	
		4'8 1/2"	

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

0	18/12/23	DWG VERSION ESTABLISHED
No.	Date	Revision

Standard / GO TRANSIT #10-115b INS CT SPP PS  
 UNIFORM FLHL SMSG

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



Date DEC 23/2018 Plan Number GTS-2704 Rev 0

REFERENCE: Sheet 1 OF 1

## BILL OF MATERIALS FOR GTS-2704

ITEM	DESCRIPTION	NARSTCO PART NO.	QTY
<b>TURNOUT COMPONENT</b>			
1	ADJUSTABLE RAIL BRACE	8014	10
2	RAIL BRACE SERRATED WASHER	8015	26
3#	RAIL BRACE HOOK-IN SHOULDER	8016	70
4	NARSTCO HOOK-IN SHOULDER	4010	370
5	'e' CLIP ('e' TYPE CLIP)	'e' CLIP	534
6	WEDGE PLATE	14S,14T,15S, 15T,16S,16T, 17S, 17T	8
7*	WEDGE PLATE PIN	14,15,16,17	8
8	'J' CLIP	NJ1	32
9	FROG CLAMP (S.M.S.G.)	8018	16
10	L/H 'e' CLIP	Ne2	5
11*	RAIL BRACE WELD-ON SHOULDER	BWOS	26
12*	WELD-ON SHOULDER	WOS	32
13	INSULATOR	HD-10	468
14	OFFSET INSULATING PAD 5 1/2"	3020	12
15	NARSTCO INSULATING PAD 5 1/2"	3025	180
16	INSULATED JOINT INSULATOR	J7819	8
17	INSULATED JOINT CLIP	e2063	8
18	CUSTOM INSULATOR PAD	16,17,46,54,55	7
19	JOINT BAR INSULATOR	N8J-HD	32
20	WELD-ON SHOULDER WITH BLOCK	WOS	28
<b>GO TRANSIT REFERENCES</b>			
<b>PLAN #</b>	<b>TITLE</b>		
GTS-0016-REV1	NO. 10 TURNOUT-115 LB. RAIL LIGHT DUTY 16'6" GEOMETRY 38'5" POINT LENGTH SAMSON SWITCH UNIFORM RISER DESIGN WOOD TIES		
GTS-0820-1/2	SOLID MANGANESE STEEL SELF GUARDED FROGS		
<b>WESTERN CULLEN HAYES REFERENCES</b>			
7ST235R-19-20	SWITCH POINT GUARD FOR CHANNEL TIE RIGHT HAND		
7ST235L-19-20	SWITCH POINT GUARD FOR CHANNEL TIE LEFT HAND		
<b>LEGEND</b>			
* WELDED TO TIE DURING MANUFACTURING			
# INSTALLED ON TIE DURING MANUFACTURING			