PIN PACKAGES INDEX

GLOBAL STANDARD COMPONENTS
NAAMS™
Assembly 08/15/07

PAGE	DATE	NAAMS CODE	DESCRIPTION
P-1	08/15/07		Pin Packages Index
P-1.1	08/15/07		Pin Packages Index
P-2	12/19/02		Retr. Loc. Pin Specifications
P-3	08/15/07	AHB006–AHB007	Retr. Loc. Pin Bracket Inside Mount
P-4	08/15/07	AHB010–AHB011	Retr. Loc. Pin Bracket Outside Mount
P-5	03/01/99		Retr. Loc. Pin Unit Mounting L-Block Attached Pin
P-6	07/01/99		Retr. Loc. Pin Unit Mounting, In-Line Pin Attachment
P-7	03/01/99		In-Line Pin Attachment
P-8	08/15/07	APS061R–APS169R	Retr. Loc. Pin 6 mm Thru 16 mm Dia. (Full Mtr.)
P-9	03/28/05	APS061R–APS169R	Retr. Loc. Pin 6 mm Thru 16 mm Dia. (Full Mtr.)
P-10	08/15/07	APS190R–APS259R	Retr. Loc. Pin 19 mm Thru 25 mm Dia. (Full Mtr.)
P-11	03/28/05	APS190R–APS259R	Retr. Loc. Pin 19 mm Thru 25 mm Dia. (Full Mtr.)
P-12	08/15/07	APE061R–APE139R	Retr. Loc. Pin, 6x12 Thru 13x19 Slotted Holes (Full Mtr.)
P-13	03/28/05	APE061R–APE139R	Retr. Loc. Pin, 6x12 Thru 13x19 Slotted Holes (Full Mtr.)
P-14	08/15/07	APE160R–APE259R	Retr. Loc. Pin, 16x22 Thru 25x31 Slotted Holes (Full Mtr.)
P-15	03/28/05	APE160R–APE259R	Retr. Loc. Pin, 16x22 Thru 25x31 Slotted Holes (Full Mtr.)
P-16	08/15/07	APE061S–APR139S	Retr. Loc. Pin, 6x12 Thru 13x19 Slotted Holes (Full Mtr.)
P-17	03/28/05	APE061S–APR139S	Retr. Loc. Pin, 6x12 Thru 13x19 Slotted Holes (Full Mtr.)
P-18	08/15/07	APE160S–APE259S	Retr. Loc. Pin, 16x22 Thru 25x31 Slotted Holes (Full Mtr.)
P-19	03/28/05	APE160S–APE259S	Retr. Loc. Pin, 16x22 Thru 25x31 Slotted Holes (Full Mtr.)
P-20	08/15/07	ARP061R–ARP169R	Retr. Rspt. Pin 6 mm Thru 16 mm Dia. (Full Mtr.)
P-21	03/28/05	ARP061R–ARP169R	Retr. Rspt. Pin 6 mm Thru 16 mm Dia. (Full Mtr.)
P-22	08/15/07	ARP190R–ARP259R	Retr. Rspt. Pin 19 mm Thru 25 mm Dia. (Full Mtr.)
P-23	03/28/05	ARP190R–ARP259R	Retr. Rspt. Pin 19 mm Thru 25 mm Dia. (Full Mtr.)

©1997 Auto/Steel Partnership

PIN PACKAGES INDEX

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 08/15/07

©1997 Auto/Steel Partnership

General Specification

1. There are two standards: one for the in-line mounting (pin mounted in the ram) and one for the offset mounting (pin is offset from the shaft).
2. Cylinder bore: 63 mm.
3. Cylinder strokes: 25, 50, 75, and 100 mm.
4. Rap, if used, is 2 mm reducing the pin travel by 2 mm.
5. Two mounting brackets are available for outside and two for inside mounting (used in conjunction with NAAMS riser angle brackets):
   Inside Mount: AHB006 & AHB007
   Outside Mount: AHB010 & AHB011
6. Mounting pattern in the retractable locating pin housing will be 60 mm x 60 mm (that accommodates 2-M10 dowels and 4-M10 threaded holes).
7. Spacer series ACS6XX accommodates the 60 x 60 mounting of the retractable locating pin units.

In-Line Pin Mounting

1. See the in-line pin illustration for the standard NAAMS mounting dimensions- Pg. P-6 and P-7.
2. “Z” dimension is 75 mm.
3. 40 mm from pin centerline to mounting surface of the unit. (Manufacturer to supply spacer if required.)
4. Shoulder bolt and steel lock nut for pin attachment supplied by unit manufacturer.

Offset (L-Block) Pin Mounting

1. See the offset pin illustration for the standard NAAMS mounting dimensions- Pg. P-5.
2. Pins can be secured to the offset retracting locating pin units by utilizing the NAAMS pin retainers, L-blocks, or non-standard details.
3. Any applicable NAAMS pin may be used that is compatible with the design.
4. “Z” dimension varies per manufacturer.
5. 40 mm from ram centerline to mounting surface of the unit. (Unit mounting surface to L-Block mounting surface varies per manufacturer.)

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN BRACKET INSIDE MOUNT

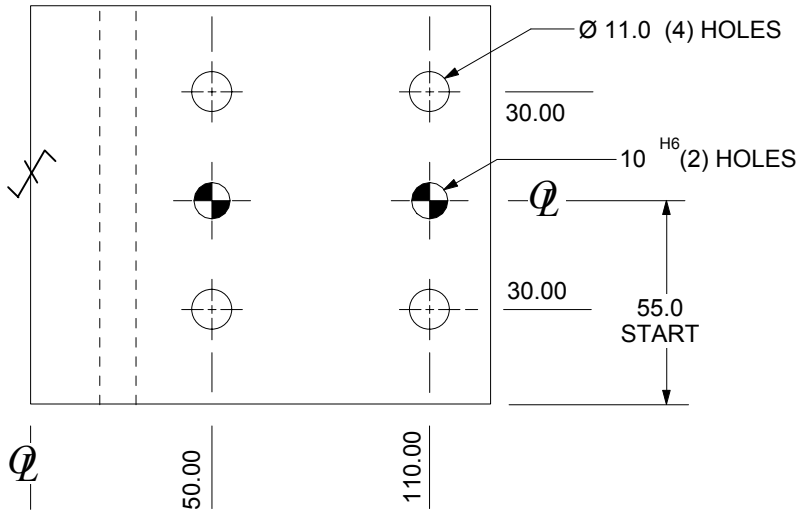
GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly

08/15/07

Tolerances:
1 PLACE MACHINING ± 0.3
1 PLACE FABRICATION ± 1.5
2 PLACE ±0.08 BETWEEN MACHINED SURFACES
±0.03 BETWEEN SINGLE DOWEL AND A HEEL SURFACE
±0.03 BETWEEN DOWELS IN THE SAME PLANE
±0.10 BETWEEN DOWELS IN DIFFERENT PLANES
±0.13 TO SCREW HOLES, NON ACCUMULATIVE

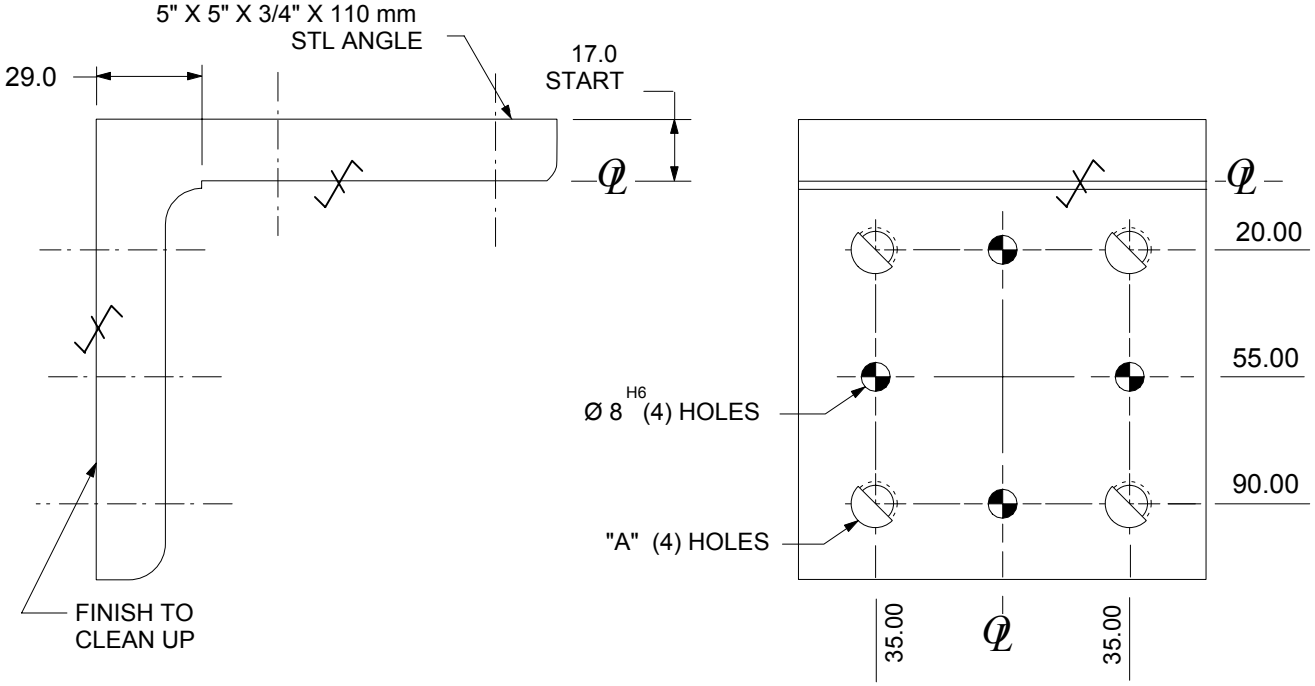
SURFACES TO BE FLAT, PARALLEL & PERPENDICULAR TO WITHIN 0.015 T.I.R.
NOTES: ALL DIMENSIONS METRIC UNLESS OTHERWISE NOTED.



NAAMS CODE	A
AHB006	11.0
AHB007	M10 x 1.5

MATERIAL: ASTM A-36
SEE PAGE B-1.1 FOR
GLOBAL MATERIALS CHART

A

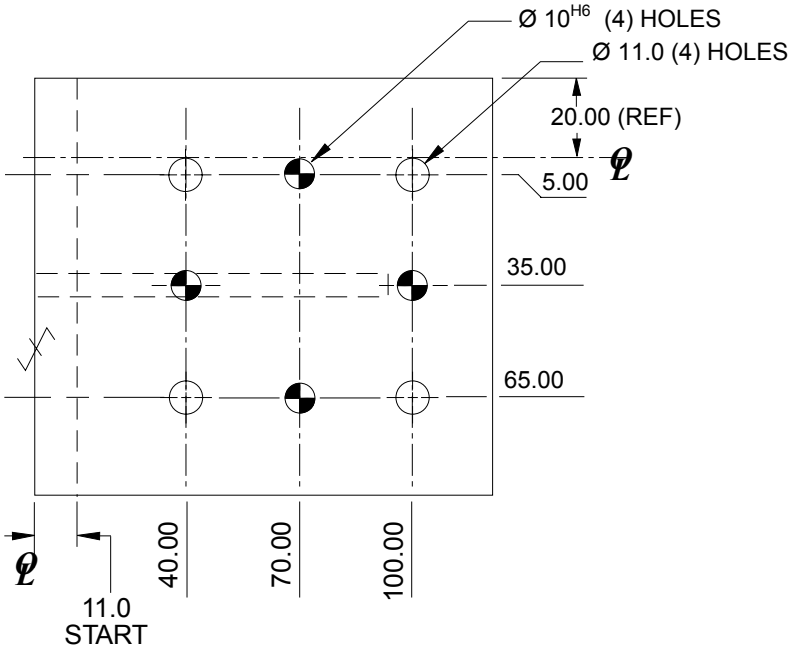


©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN BRACKET OUTSIDE MOUNT

GLOBAL STANDARD COMPONENTS
NAAMS™
Assembly
08/15/07

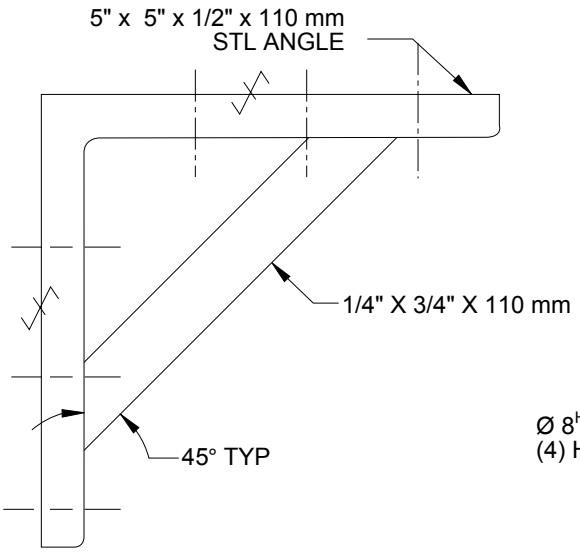
Tolerances:
1 PLACE MACHINING ± 0.3
1 PLACE FABRICATION ± 1.5
2 PLACE ±0.08 BETWEEN MACHINED SURFACES
±0.03 BETWEEN SINGLE DOWEL AND A HEEL SURFACE
±0.03 BETWEEN DOWELS IN THE SAME PLANE
±0.10 BETWEEN DOWELS IN DIFFERENT PLANES
±0.13 TO SCREW HOLES, NON ACCUMULATIVE
SURFACES TO BE FLAT, PARALLEL & PERPENDICULAR TO WITHIN 0.015 T.I.R.
NOTES: ALL DIMENSIONS METRIC UNLESS OTHERWISE NOTED.

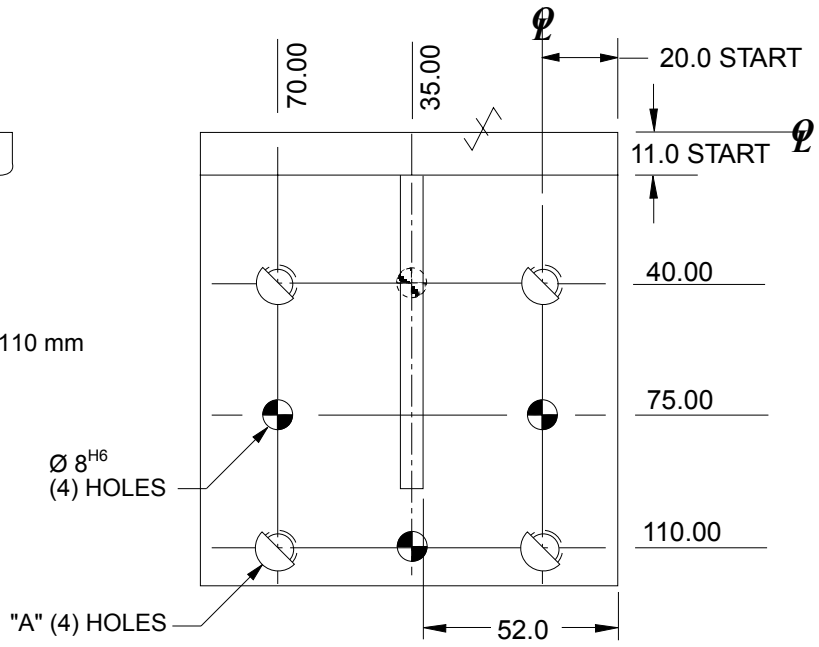


NAAMS CODE	A
AHB010	11.0
AHB011	M10 x 1.5

MATERIAL: STEEL ASTM A-36
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART

A





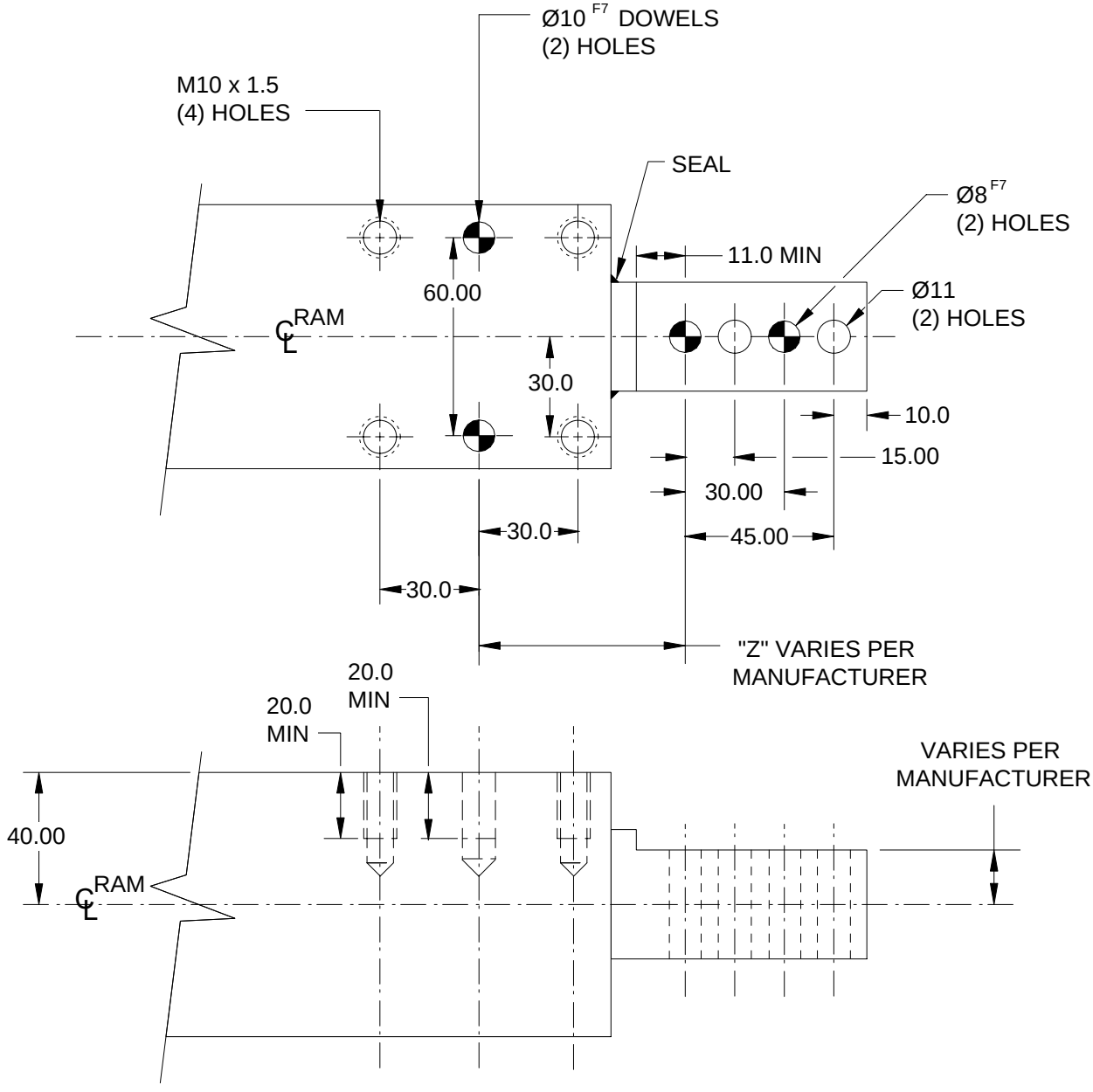
©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN UNIT MOUNTING L-BLOCK ATTACHED PIN

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/01/99

Tolerances:
1 PLACE MACHINING ± 0.3
1 PLACE FABRICATION ± 1.5
2 PLACE ±0.08 BETWEEN MACHINED SURFACES
±0.03 BETWEEN SINGLE DOWEL AND A HEEL SURFACE
±0.03 BETWEEN DOWELS IN THE SAME PLANE
±0.10 BETWEEN DOWELS IN DIFFERENT PLANES
±0.13 TO SCREW HOLES, NON ACCUMULATIVE
SURFACES TO BE FLAT, PARALLEL & PERPENDICULAR TO WITHIN 0.015 T.I.R.
NOTES: ALL DIMENSIONS METRIC UNLESS OTHERWISE NOTED.



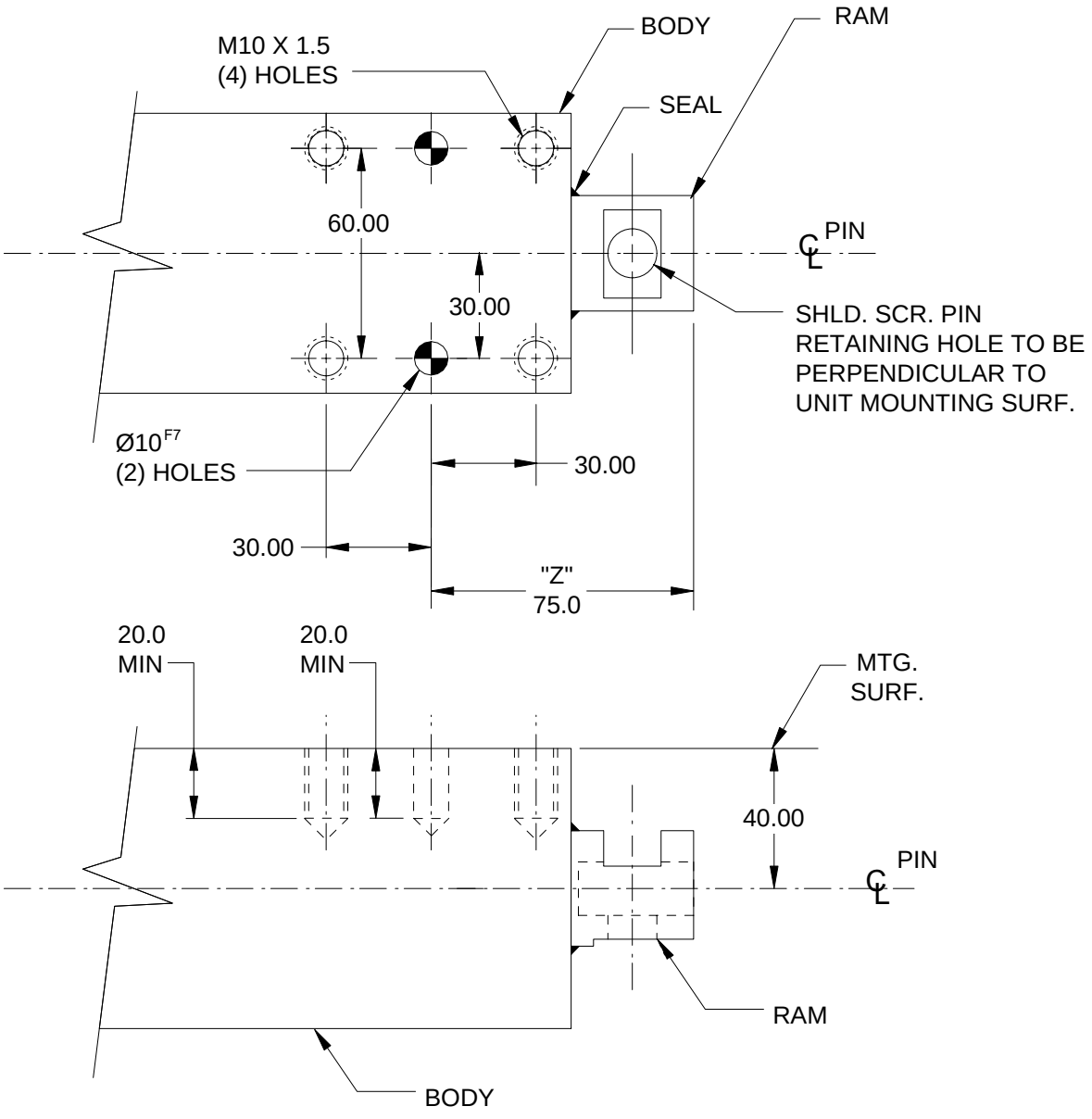
RAM SHOWN IN RETRACTED POSITION

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN UNIT MOUNTING FOR IN-LINE PIN ATTACHMENT

GLOBAL STANDARD COMPONENTS
NAAMS™
Assembly 07/01/99

Tolerances:
1 PLACE MACHINING ± 0.3
1 PLACE FABRICATION ± 1.5
2 PLACE ±0.08 BETWEEN MACHINED SURFACES
±0.03 BETWEEN SINGLE DOWEL AND A HEEL SURFACE
±0.03 BETWEEN DOWELS IN THE SAME PLANE
±0.10 BETWEEN DOWELS IN DIFFERENT PLANES
±0.13 TO SCREW HOLES, NON ACCUMULATIVE
SURFACES TO BE FLAT, PARALLEL & PERPENDICULAR TO WITHIN 0.015 T.I.R.
NOTES: ALL DIMENSIONS METRIC UNLESS OTHERWISE NOTED.



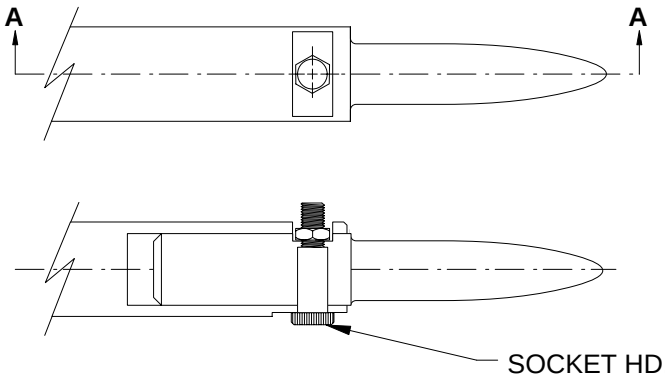
RAM SHOWN IN RETRACTED POSITION

A

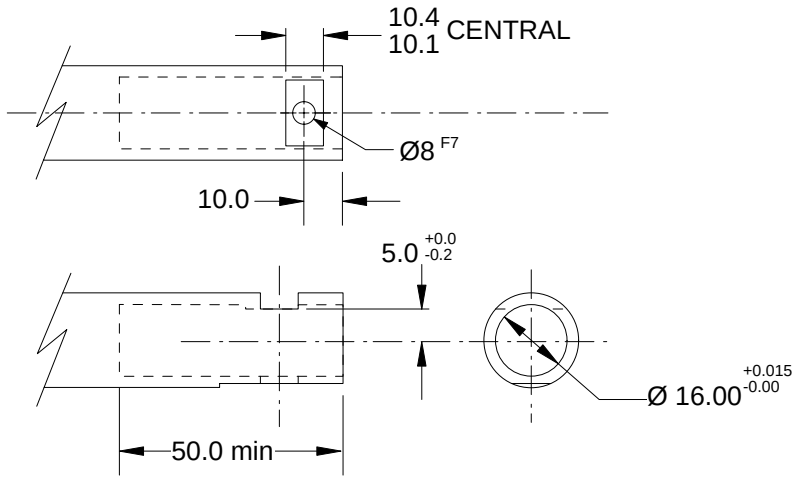
IN-LINE PIN ATTACHMENT

Tolerances:
- 1 PLACE MACHINING ± 0.3
- 1 PLACE FABRICATION ± 1.5
- 2 PLACE ±0.08 BETWEEN MACHINED SURFACES
  ±0.03 BETWEEN SINGLE DOWEL AND A HEEL SURFACE
  ±0.03 BETWEEN DOWELS IN THE SAME PLANE
  ±0.10 BETWEEN DOWELS IN DIFFERENT PLANES
  ±0.13 TO SCREW HOLES, NON ACCUMULATIVE

SURFACES TO BE FLAT, PARALLEL & PERPENDICULAR TO WITHIN 0.015 T.I.R.
NOTES: ALL DIMENSIONS METRIC UNLESS OTHERWISE NOTED.



SECTION A-A



RETRACTABLE LOCATING PIN 6mm THRU 16mm DIAMETER (FULL METRIC)

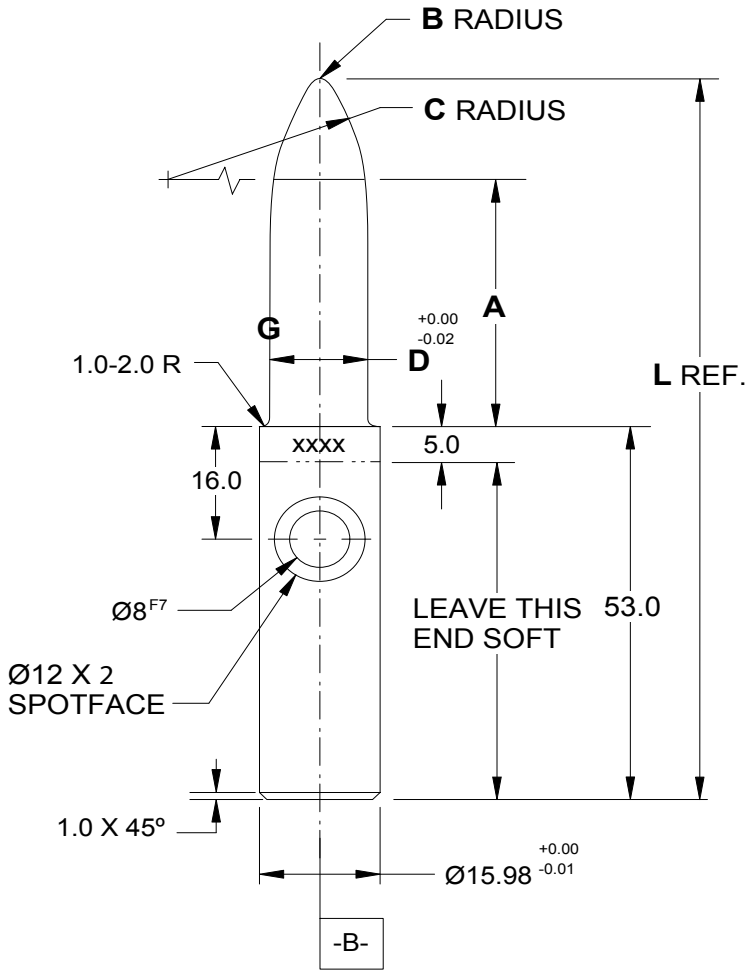
GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly

08/03/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUM B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXXX**
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART

A
C



B

CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION

TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership
This document is Uncontrolled when printed.

RETRACTABLE LOCATING PIN 6 mm THRU 16 mm DIAMETER (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

A

6 mm Round Hole
B Rad = 1.0
C Rad = 18.0
D = 5.85

NAAMS CODE	A	L	WT. kg
APS061R	10.0	71.8	0.08
APS062R	15.0	76.8	0.08
APS063R	25.0	86.8	0.08
APS064R	35.0	96.8	0.08
APS065R	45.0	106.8	0.09
APS066R	55.0	116.8	0.09

8 mm Round Hole
B Rad = 1.0
C Rad = 24.0
D = 7.85

NAAMS CODE	A	L	WT. kg
APS081R	10.0	75.1	0.08
APS082R	15.0	80.1	0.08
APS083R	25.0	90.1	0.09
APS084R	35.0	100.1	0.09
APS085R	45.0	110.1	0.10
APS086R	55.0	120.1	0.10
APS087R	65.0	130.1	0.10
APS088R	75.0	140.1	0.11

10 mm Round Hole
B Rad = 2.0
C Rad = 30.0
D = 9.85

NAAMS CODE	A	L	WT. kg
APS101R	10.0	77.4	0.09
APS102R	15.0	82.4	0.09
APS103R	25.0	92.4	0.10
APS104R	35.0	102.4	0.10
APS105R	45.0	112.4	0.11
APS106R	55.0	122.4	0.11
APS107R	65.0	132.4	0.12
APS108R	75.0	142.4	0.13
APS109R	85.0	152.4	0.13
APS100R	95.0	162.4	0.14

13 mm Round Hole
B Rad = 2.0
C Rad = 39.0
D = 12.85

NAAMS CODE	A	L	WT. kg
APS131R	10.0	82.4	0.10
APS132R	15.0	87.4	0.10
APS133R	25.0	97.4	0.11
APS134R	35.0	107.4	0.12
APS135R	45.0	117.4	0.13
APS136R	55.0	127.4	0.14
APS137R	65.0	137.4	0.15
APS138R	75.0	147.4	0.16
APS139R	85.0	157.4	0.17
APS130R	95.0	167.4	0.18

16 mm Round Hole
B Rad = 2.0
C Rad = 48.0
D = 15.85

NAAMS CODE	A	L	WT. kg
APS161R	10.0	87.5	0.11
APS162R	15.0	92.5	0.12
APS163R	25.0	102.5	0.14
APS164R	35.0	112.5	0.15
APS165R	45.0	122.5	0.17
APS166R	55.0	132.5	0.18
APS167R	65.0	142.5	0.20
APS168R	75.0	152.5	0.21
APS169R	85.0	162.5	0.23
APS160R	95.0	172.5	0.24

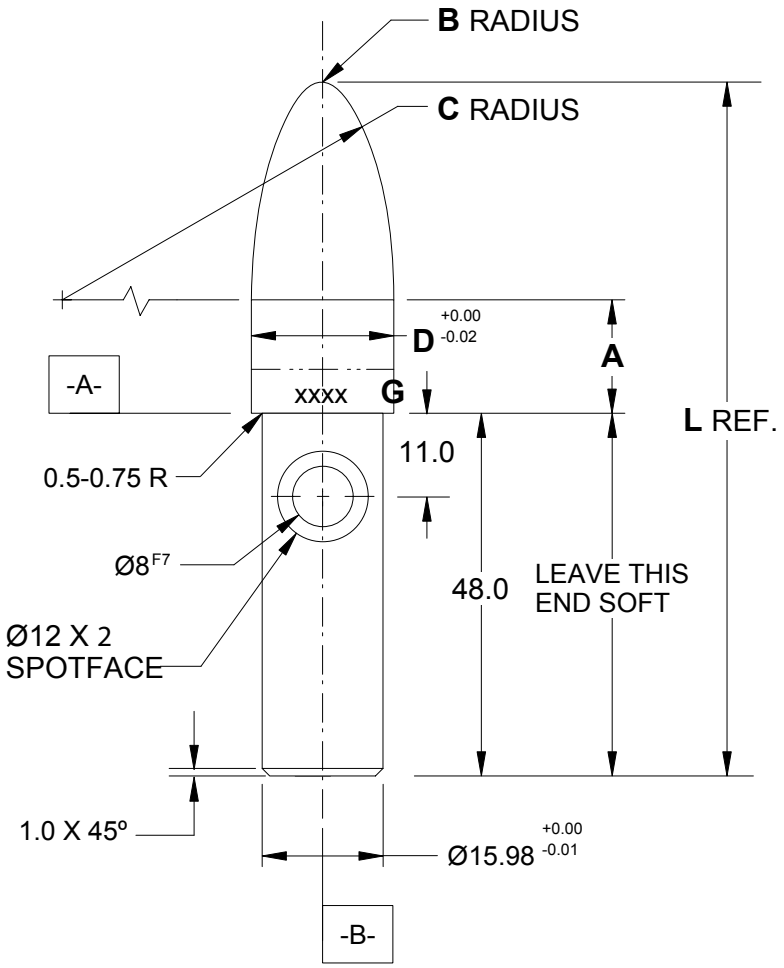
©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN 19 mm THRU 25 mm DIAMETER (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXXX**
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN
19 mm THRU 25 mm DIAMETER
(FULL METRIC)

A

19 mm Round Hole
B Rad = 2.0
C Rad = 38.0
D = 18.85

NAAMS CODE	A	L	WT. kg
APS191R	15.0	86.8	0.13
APS192R	20.0	91.8	0.14
APS193R	30.0	101.8	0.16
APS194R	40.0	111.8	0.19
APS195R	50.0	121.8	0.21
APS196R	60.0	131.8	0.23
APS197R	70.0	141.8	0.25
APS198R	80.0	151.8	0.27
APS199R	90.0	161.8	0.29
APS190R	100.0	171.8	0.31

25 mm Round Hole
B Rad = 2.0
C Rad = 50.0
D = 24.85

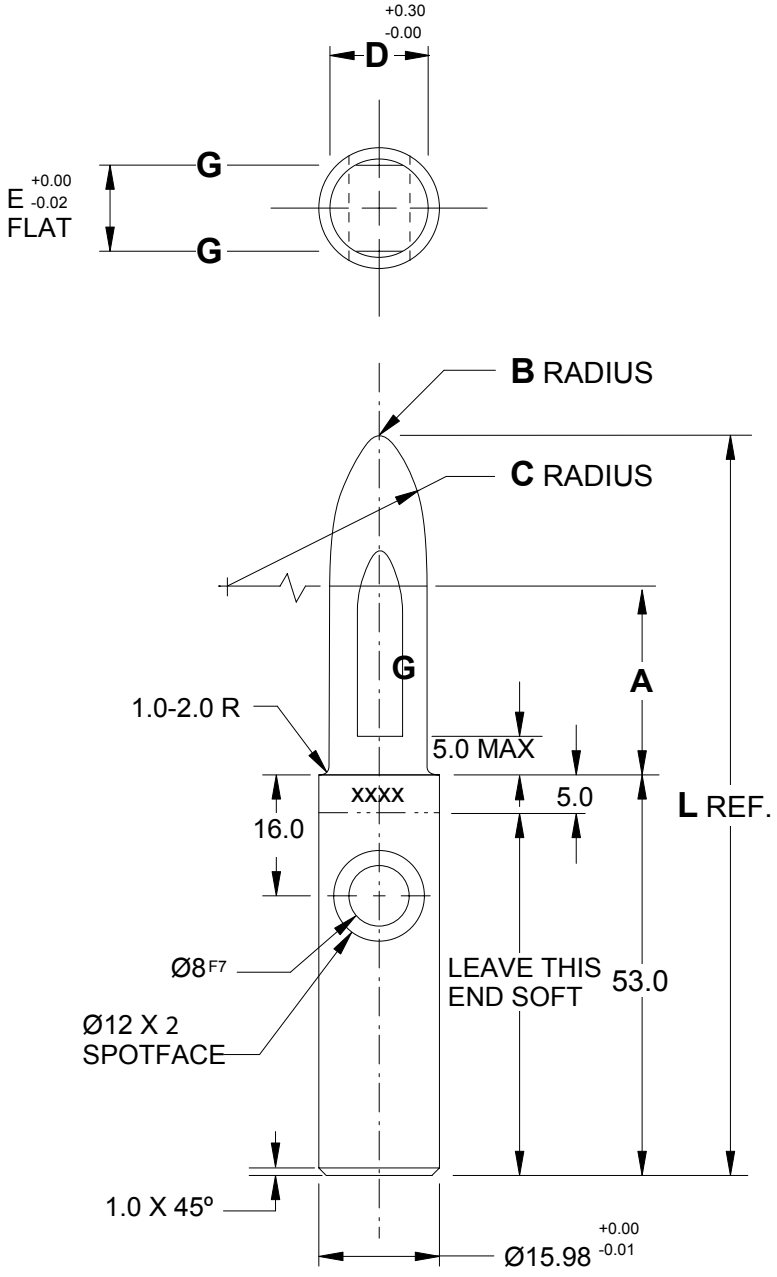
NAAMS CODE	A	L	WT. kg
APS251R	15.0	94.8	0.19
APS252R	20.0	99.8	0.21
APS253R	30.0	109.8	0.24
APS254R	40.0	119.8	0.28
APS255R	50.0	129.8	0.32
APS256R	60.0	139.8	0.36
APS257R	70.0	149.8	0.39
APS258R	80.0	159.8	0.43
APS259R	90.0	169.8	0.47
APS250R	100.0	179.8	0.51

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN FOR 6 X 12 THRU 13 X 19 SLOTTED HOLES (FULL METRIC)™

GLOBAL STANDARD COMPONENTS
NAAMS
Assembly
08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXX**
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership
This document is Uncontrolled when printed.

RETRACTABLE LOCATING PIN FOR 6 x 12 THRU 13 x 19 SLOTTED HOLES (FULL METRIC)

A

6 x 12 Slotted Hole
B Rad = 1.0
C Rad = 18.0
D = 7.09
E = 5.85

NAAMS CODE	A	L	WT. kg
APE061R	10.0	72.9	0.08
APE062R	15.0	77.9	0.08
APE063R	25.0	87.9	0.09
APE064R	35.0	97.9	0.09
APE065R	45.0	107.9	0.09
APE066R	55.0	117.9	0.09

8 x 14 Slotted Hole
B Rad = 1.0
C Rad = 24.0
D = 8.81
E = 7.85

NAAMS CODE	A	L	WT. kg
APE081R	10.0	76.0	0.08
APE082R	15.0	81.0	0.09
APE083R	25.0	91.0	0.09
APE084R	35.0	101.0	0.10
APE085R	45.0	111.0	0.10
APE086R	55.0	121.0	0.11
APE087R	65.0	131.0	0.11
APE088R	75.0	141.0	0.12

10 x 16 Slotted Hole
B Rad = 2.0
C Rad = 30.0
D = 10.63
E = 9.85

NAAMS CODE	A	L	WT. kg
APE101R	10.0	78.2	0.09
APE102R	15.0	83.2	0.09
APE103R	25.0	93.2	0.10
APE104R	35.0	103.2	0.11
APE105R	45.0	113.2	0.11
APE106R	55.0	123.2	0.12
APE107R	65.0	133.2	0.13
APE108R	75.0	143.2	0.13
APE109R	85.0	153.2	0.14
APE100R	95.0	163.2	0.15

13 x 19 Slotted Hole
B Rad = 2.0
C Rad = 39.0
D = 13.46
E = 12.85

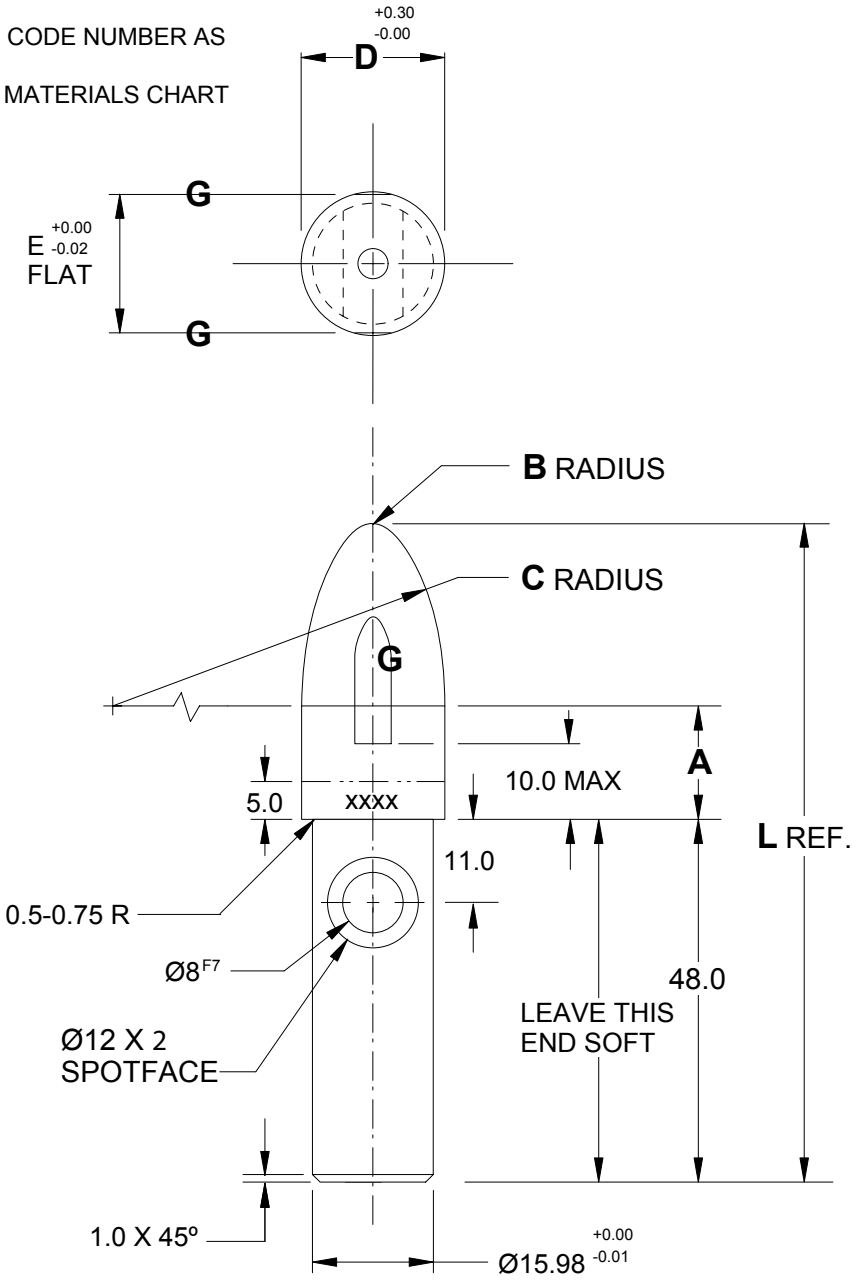
NAAMS CODE	A	L	WT. kg
APE131R	10.0	83.1	0.10
APE132R	15.0	88.1	0.10
APE133R	25.0	98.1	0.12
APE134R	35.0	108.1	0.13
APE135R	45.0	118.1	0.14
APE136R	55.0	128.1	0.15
APE137R	65.0	138.1	0.16
APE138R	75.0	148.1	0.17
APE139R	85.0	158.1	0.18
APE130R	95.0	168.1	0.19

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN FOR 16 X 22 THRU 25 X 31 SLOTTED HOLES (FULL METRIC)™

GLOBAL STANDARD COMPONENTS
NAAMS
Assembly
08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXX**
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN FOR 16 x 22 THRU 25 x 31 SLOTTED HOLES (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

A

16 x 22 Slotted Hole
B Rad = 2.0
C Rad = 48.0
D = 16.35
E = 15.85

NAAMS CODE	A	L	WT. kg
APE161R	15.0	88.0	0.12
APE162R	20.0	93.0	0.13
APE163R	30.0	103.0	0.14
APE164R	40.0	113.0	0.16
APE165R	50.0	123.0	0.18
APE166R	60.0	133.0	0.19
APE167R	70.0	143.0	0.21
APE168R	80.0	153.0	0.22
APE169R	90.0	163.0	0.24
APE160R	100.0	173.0	0.26

19 x 25 Slotted Hole
B Rad = 2.0
C Rad = 38.0
D = 19.27
E = 18.85

NAAMS CODE	A	L	WT. kg
APE191R	15.0	87.2	0.13
APE192R	20.0	92.2	0.15
APE193R	30.0	102.2	0.17
APE194R	40.0	112.2	0.19
APE195R	50.0	122.2	0.21
APE196R	60.0	132.2	0.24
APE197R	70.0	142.2	0.26
APE198R	80.0	152.2	0.28
APE199R	90.0	162.2	0.30
APE190R	100.0	172.2	0.33

25 x 31 Slotted Hole
B Rad = 2.0
C Rad = 50.0
D = 25.17
E = 24.85

NAAMS CODE	A	L	WT. kg
APE251R	15.0	95.1	0.19
APE252R	20.0	100.1	0.21
APE253R	30.0	110.1	0.25
APE254R	40.0	120.1	0.29
APE255R	50.0	130.1	0.33
APE256R	60.0	140.1	0.37
APE257R	70.0	150.1	0.40
APE258R	80.0	160.1	0.44
APE259R	90.0	170.1	0.48
APE250R	100.0	180.1	0.52

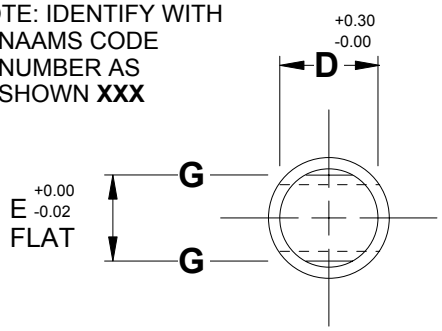
©1997 Auto/Steel Partnership

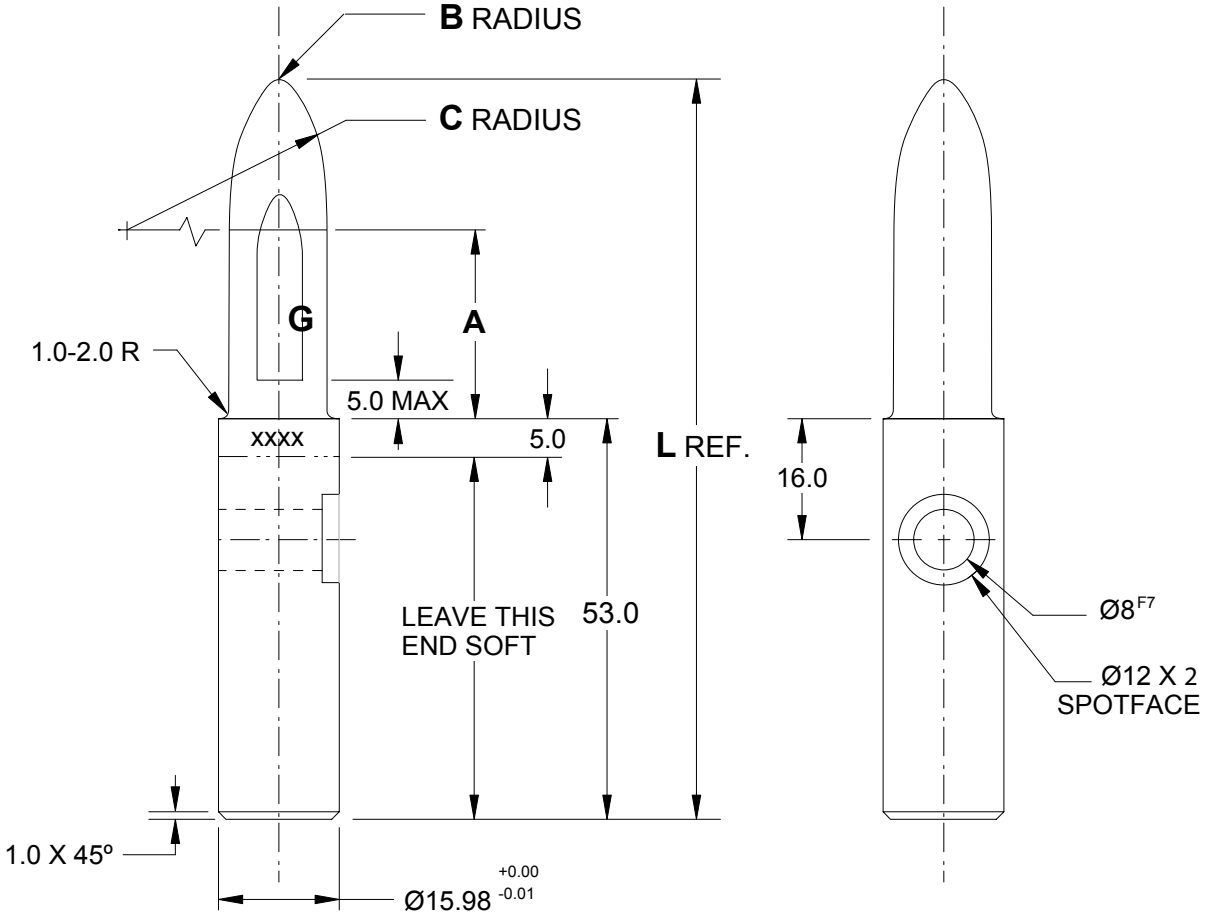
RETRACTABLE LOCATING PIN FOR 6 X 12 THRU 13 X 19 SLOTTED HOLES (FULL METRIC)™

GLOBAL STANDARD COMPONENTS
NAAMS
Assembly
08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXX**

SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART





CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN FOR 6 x 12 THRU 13 x 19 SLOTTED HOLES (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

A

6 x 12 Slotted Hole
B Rad = 1.0
C Rad = 18.0
D = 7.09
E = 5.85

NAAMS CODE	A	L	WT. kg
APE061S	10.0	72.9	0.08
APE062S	15.0	77.9	0.08
APE063S	25.0	87.9	0.09
APE064S	35.0	97.9	0.09
APE065S	45.0	107.9	0.09
APE066S	55.0	117.9	0.09

8 x 14 Slotted Hole
B Rad = 1.0
C Rad = 24.0
D = 8.81
E = 7.85

NAAMS CODE	A	L	WT. kg
APE081S	10.0	76.0	0.08
APE082S	15.0	81.0	0.09
APE083S	25.0	91.0	0.09
APE084S	35.0	101.0	0.10
APE085S	45.0	111.0	0.10
APE086S	55.0	121.0	0.11
APE087S	65.0	131.0	0.11
APE088S	75.0	141.0	0.12

10 x 16 Slotted Hole
B Rad = 2.0
C Rad = 30.0
D = 10.63
E = 9.85

NAAMS CODE	A	L	WT. kg
APE101S	10.0	78.2	0.09
APE102S	15.0	83.2	0.09
APE103S	25.0	93.2	0.10
APE104S	35.0	103.2	0.11
APE105S	45.0	113.2	0.11
APE106S	55.0	123.2	0.12
APE107S	65.0	133.2	0.13
APE108S	75.0	143.2	0.13
APE109S	85.0	153.2	0.14
APE100S	95.0	163.2	0.15

13 x 19 Slotted Hole
B Rad = 2.0
C Rad = 39.0
D = 13.46
E = 12.85

NAAMS CODE	A	L	WT. kg
APE131S	10.0	83.1	0.10
APE132S	15.0	88.1	0.10
APE133S	25.0	98.1	0.12
APE134S	35.0	108.1	0.13
APE135S	45.0	118.1	0.14
APE136S	55.0	128.1	0.15
APE137S	65.0	138.1	0.16
APE138S	75.0	148.1	0.17
APE139S	85.0	158.1	0.18
APE130S	95.0	168.1	0.19

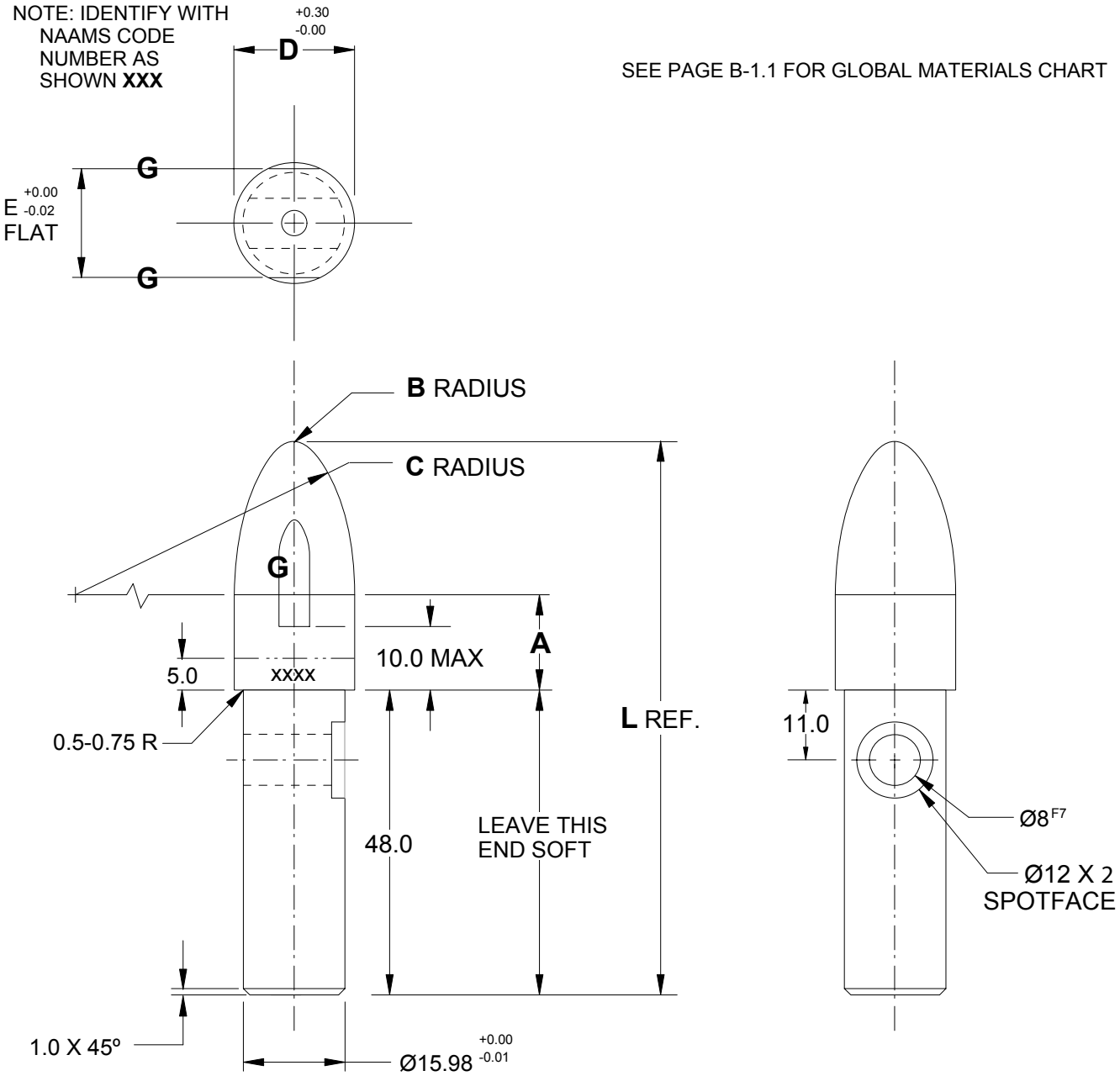
©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN FOR 16 X 22 THRU 25 X 31 SLOTTED HOLES (FULL METRIC)™

GLOBAL STANDARD COMPONENTS
NAAMS
Assembly
08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXX**

SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership
This document is Uncontrolled when printed.

RETRACTABLE LOCATING PIN FOR 16 x 22 THRU 25 x 31 SLOTTED HOLES (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

A

16 x 22 Slotted Hole
B Rad = 2.0
C Rad = 48.0
D = 16.35
E = 15.85

NAAMS CODE	A	L	WT. kg
APE161S	15.0	88.0	0.12
APE162S	20.0	93.0	0.13
APE163S	30.0	103.0	0.14
APE164S	40.0	113.0	0.16
APE165S	50.0	123.0	0.18
APE166S	60.0	133.0	0.19
APE167S	70.0	143.0	0.21
APE168S	80.0	153.0	0.22
APE169S	90.0	163.0	0.24
APE160S	100.0	173.0	0.26

19 x 25 Slotted Hole
B Rad = 2.0
C Rad = 38.0
D = 19.27
E = 18.85

NAAMS CODE	A	L	WT. kg
APE191S	15.0	87.2	0.13
APE192S	20.0	92.2	0.15
APE193S	30.0	102.2	0.17
APE194S	40.0	112.2	0.19
APE195S	50.0	122.2	0.21
APE196S	60.0	132.2	0.24
APE197S	70.0	142.2	0.26
APE198S	80.0	152.2	0.28
APE199S	90.0	162.2	0.30
APE190S	100.0	172.2	0.33

25 x 31 Slotted Hole
B Rad = 2.0
C Rad = 50.0
D = 25.17
E = 24.85

NAAMS CODE	A	L	WT. kg
APE251S	15.0	95.1	0.19
APE252S	20.0	100.1	0.21
APE253S	30.0	110.1	0.25
APE254S	40.0	120.1	0.29
APE255S	50.0	130.1	0.33
APE256S	60.0	140.1	0.37
APE257S	70.0	150.1	0.40
APE258S	80.0	160.1	0.44
APE259S	90.0	170.1	0.48
APE250S	100.0	180.1	0.52

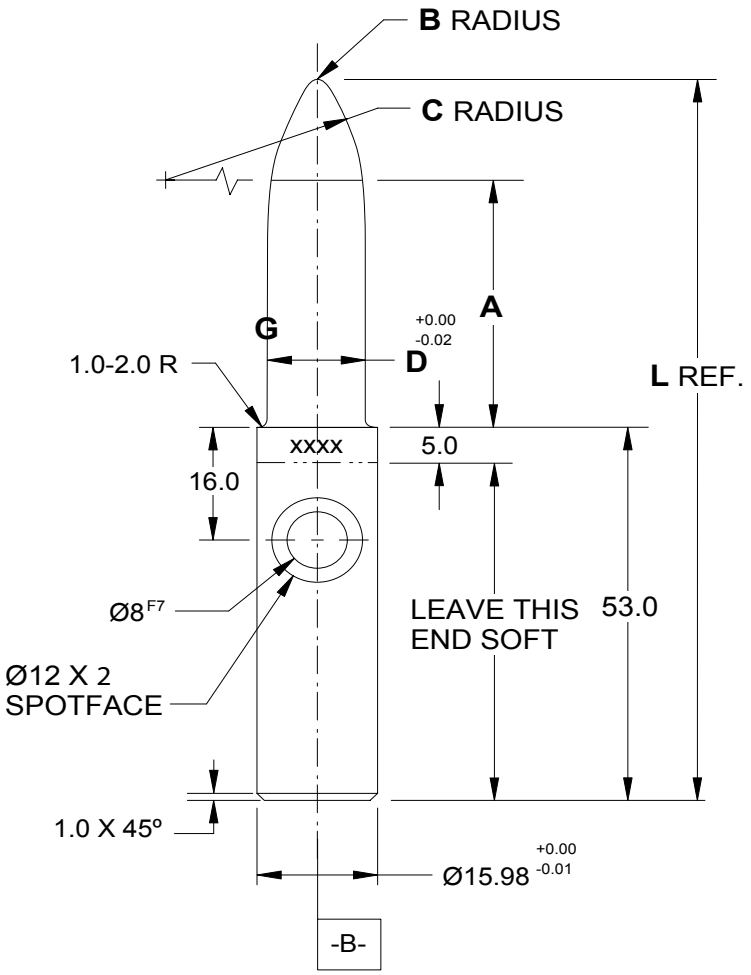
©1997 Auto/Steel Partnership

RETRACTABLE RESPOT PIN 6 mm THRU 16 mm DIAMETER (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™
Assembly

08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUM B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXXX**
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership
This document is Uncontrolled when printed.

RETRACTABLE LOCATING PIN 6 mm THRU 16 mm DIAMETER (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

A

6 mm Round Hole
B Rad = 1.0
C Rad = 18.0
D = 5.72

NAAMS CODE	A	L	WT. kg
ARP061R	10.0	71.8	0.08
ARP062R	15.0	76.8	0.08
ARP063R	25.0	86.8	0.08
ARP064R	35.0	96.8	0.08
ARP065R	45.0	106.8	0.09
ARP066R	55.0	116.8	0.09

8 mm Round Hole
B Rad = 1.0
C Rad = 24.0
D = 7.72

NAAMS CODE	A	L	WT. kg
ARP081R	10.0	75.1	0.08
ARP082R	15.0	80.1	0.08
ARP083R	25.0	90.1	0.09
ARP084R	35.0	100.1	0.09
ARP085R	45.0	110.1	0.09
ARP086R	55.0	120.1	0.10
ARP087R	65.0	130.1	0.10
ARP088R	75.0	140.1	0.11

10 mm Round Hole
B Rad = 2.0
C Rad = 30.0
D = 9.72

NAAMS CODE	A	L	WT. kg
ARP101R	10.0	77.4	0.09
ARP102R	15.0	82.4	0.09
ARP103R	25.0	92.4	0.10
ARP104R	35.0	102.4	0.10
ARP105R	45.0	112.4	0.11
ARP106R	55.0	122.4	0.11
ARP107R	65.0	132.4	0.12
ARP108R	75.0	142.4	0.12
ARP109R	85.0	152.4	0.13
ARP100R	95.0	162.4	0.14

13 mm Round Hole
B Rad = 2.0
C Rad = 39.0
D = 12.72

NAAMS CODE	A	L	WT. kg
ARP131R	10.0	82.4	0.10
ARP132R	15.0	87.4	0.10
ARP133R	25.0	97.4	0.11
ARP134R	35.0	107.4	0.12
ARP135R	45.0	117.4	0.13
ARP136R	55.0	127.4	0.14
ARP137R	65.0	137.4	0.15
ARP138R	75.0	147.4	0.16
ARP139R	85.0	157.4	0.17
ARP130R	95.0	167.4	0.18

16 mm Round Hole
B Rad = 2.0
C Rad = 48.0
D = 15.72

NAAMS CODE	A	L	WT. kg
ARP161R	10.0	87.5	0.11
ARP162R	15.0	92.5	0.12
ARP163R	25.0	102.5	0.13
ARP164R	35.0	112.5	0.15
ARP165R	45.0	122.5	0.16
ARP166R	55.0	132.5	0.18
ARP167R	65.0	142.5	0.19
ARP168R	75.0	152.5	0.21
ARP169R	85.0	162.5	0.22
ARP160R	95.0	172.5	0.24

©1997 Auto/Steel Partnership

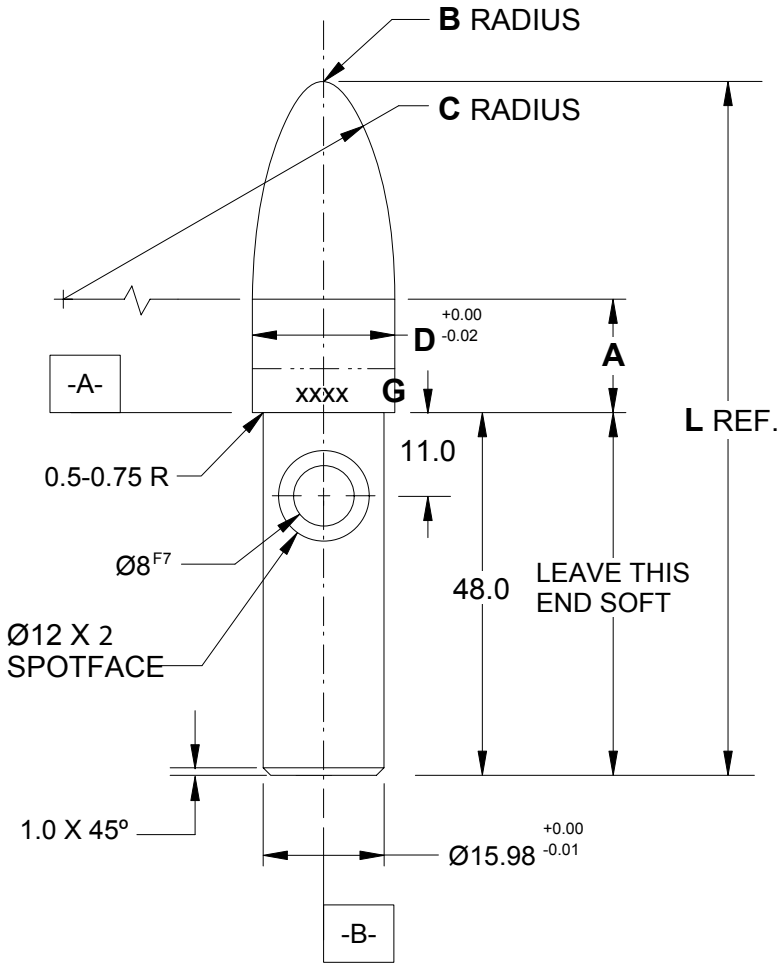
RETRACTABLE RESPOT PIN 19mm THRU 25mm DIAMETER (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™
Assembly

08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXXX**
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART

A
C



B

CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN
19 mm THRU 25 mm DIAMETER
(FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

A

19 mm Round Hole
B Rad = 2.0
C Rad = 38.0
D = 18.72

NAAMS CODE	A	L	WT. kg
ARP191R	15.0	86.8	0.13
ARP192R	20.0	91.8	0.14
ARP193R	30.0	101.8	0.16
ARP194R	40.0	111.8	0.18
ARP195R	50.0	121.8	0.20
ARP196R	60.0	131.8	0.23
ARP197R	70.0	141.8	0.25
ARP198R	80.0	151.8	0.27
ARP199R	90.0	161.8	0.29
ARP190R	100.0	171.8	0.31

25 mm Round Hole
B Rad = 2.0
C Rad = 50.0
D = 24.72

NAAMS CODE	A	L	WT. kg
ARP251R	15.0	94.8	0.19
ARP252R	20.0	99.8	0.21
ARP253R	30.0	109.8	0.24
ARP254R	40.0	119.8	0.28
ARP255R	50.0	129.8	0.32
ARP256R	60.0	139.8	0.35
ARP257R	70.0	149.8	0.39
ARP258R	80.0	159.8	0.43
ARP259R	90.0	169.8	0.47
ARP250R	100.0	179.8	0.50

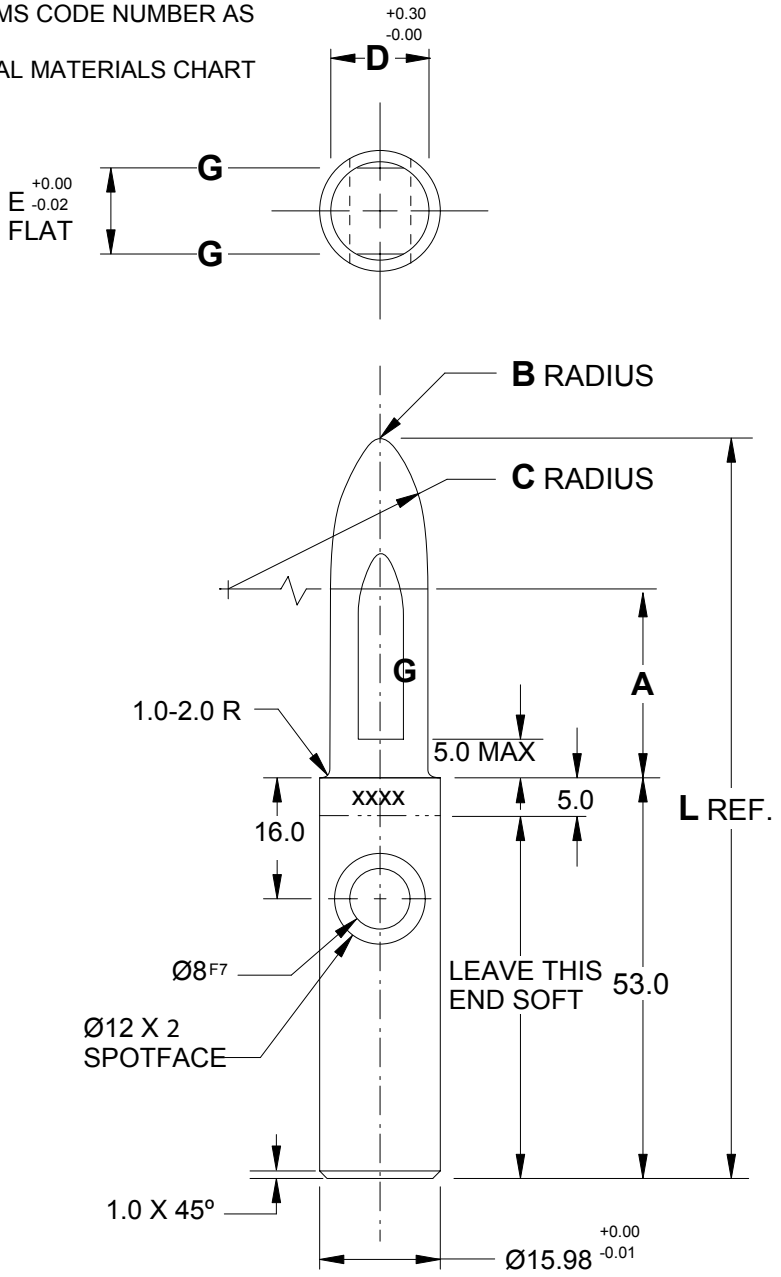
©1997 Auto/Steel Partnership

RETRACTABLE RESPOT PIN FOR 6 X 12 THRU 13 X 19 SLOTTED HOLES (FULL METRIC)™

GLOBAL STANDARD COMPONENTS
NAAMS
Assembly

08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXXX**
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN FOR 6 x 12 THRU 13 x 19 SLOTTED HOLES (FULL METRIC)

B

A

6 x 12 Slotted Hole
B Rad = 1.0
C Rad = 18.0
D = 7.09
E = 5.72

NAAMS CODE	A	L	WT. kg
ARE061R	10.0	72.9	0.08
ARE062R	15.0	77.9	0.08
ARE063R	25.0	87.9	0.09
ARE064R	35.0	97.9	0.09
ARE065R	45.0	107.9	0.09
ARE066R	55.0	117.9	0.09

8 x 14 Slotted Hole
B Rad = 1.0
C Rad = 24.0
D = 8.81
E = 7.72

NAAMS CODE	A	L	WT. kg
ARE081R	10.0	76.0	0.08
ARE082R	15.0	81.0	0.09
ARE083R	25.0	91.0	0.09
ARE084R	35.0	101.0	0.10
ARE085R	45.0	111.0	0.10
ARE086R	55.0	121.0	0.11
ARE087R	65.0	131.0	0.11
ARE088R	75.0	141.0	0.12

10 x 16 Slotted Hole
B Rad = 2.0
C Rad = 30.0
D = 10.63
E = 9.72

NAAMS CODE	A	L	WT. kg
ARE101R	10.0	78.2	0.09
ARE102R	15.0	83.2	0.09
ARE103R	25.0	93.2	0.10
ARE104R	35.0	103.2	0.11
ARE105R	45.0	113.2	0.11
ARE106R	55.0	123.2	0.12
ARE107R	65.0	133.2	0.13
ARE108R	75.0	143.2	0.13
ARE109R	85.0	153.2	0.14
ARE100R	95.0	163.2	0.15

13 x 19 Slotted Hole
B Rad = 2.0
C Rad = 39.0
D = 13.46
E = 12.72

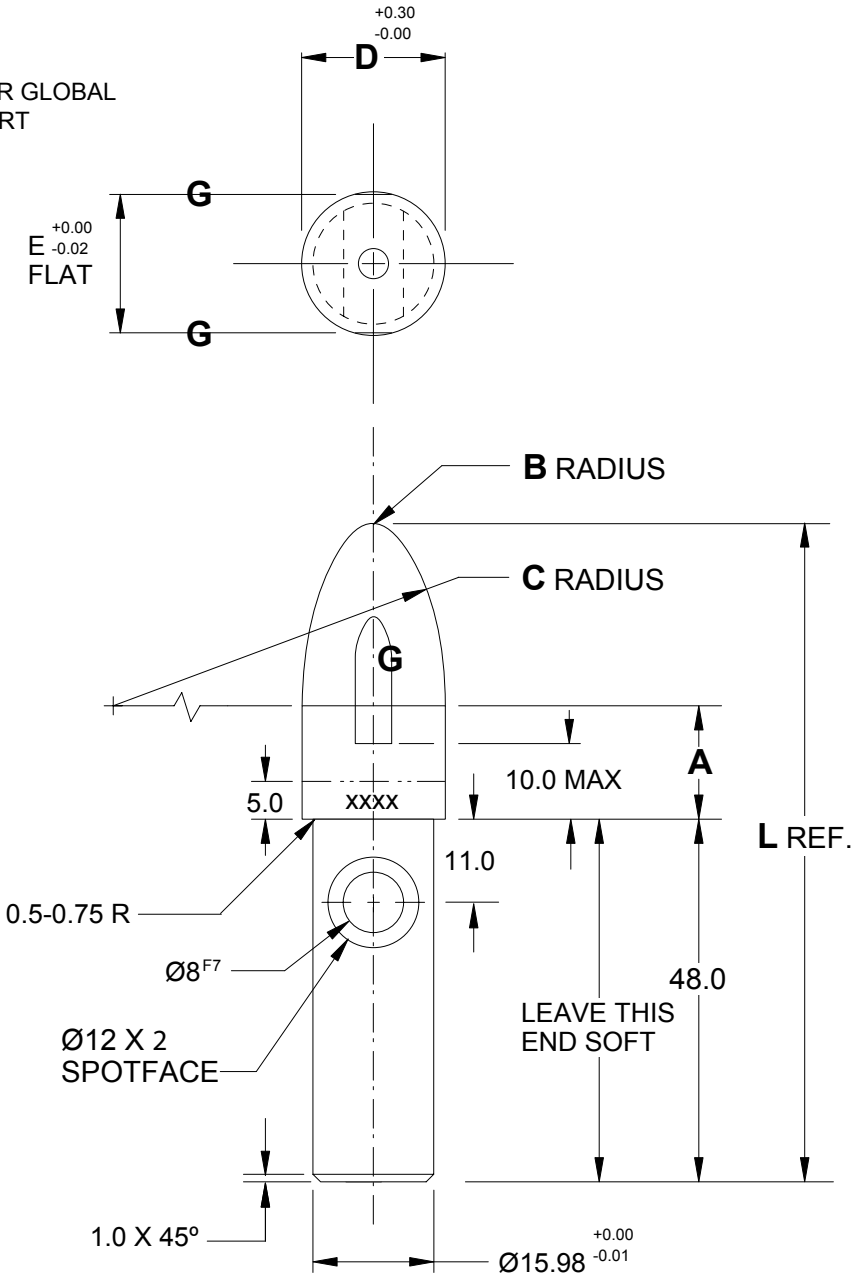
NAAMS CODE	A	L	WT. kg
ARE131R	10.0	83.1	0.10
ARE132R	15.0	88.1	0.10
ARE133R	25.0	98.1	0.12
ARE134R	35.0	108.1	0.13
ARE135R	45.0	118.1	0.14
ARE136R	55.0	128.1	0.15
ARE137R	65.0	138.1	0.16
ARE138R	75.0	148.1	0.17
ARE139R	85.0	158.1	0.18
ARE130R	95.0	168.1	0.19

©1997 Auto/Steel Partnership

RETRACTABLE RESPOT PIN FOR 16 X 22 THRU 25 X 31 SLOTTED HOLES (FULL METRIC)™

GLOBAL STANDARD COMPONENTS
NAAMS
Assembly
08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXX**
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN FOR 16 x 22 THRU 25 x 31 SLOTTED HOLES (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

A

16 x 22 Slotted Hole
B Rad = 2.0
C Rad = 48.0
D = 16.35
E = 15.72

NAAMS CODE	A	L	WT. kg
ARE161R	15.0	88.0	0.12
ARE162R	20.0	93.0	0.12
ARE163R	30.0	103.0	0.14
ARE164R	40.0	113.0	0.16
ARE165R	50.0	123.0	0.17
ARE166R	60.0	133.0	0.19
ARE167R	70.0	143.0	0.20
ARE168R	80.0	153.0	0.22
ARE169R	90.0	163.0	0.24
ARE160R	100.0	173.0	0.25

19 x 25 Slotted Hole
B Rad = 2.0
C Rad = 38.0
D = 19.27
E = 18.72

NAAMS CODE	A	L	WT. kg
ARE191R	15.0	87.2	0.13
ARE192R	20.0	92.2	0.14
ARE193R	30.0	102.2	0.17
ARE194R	40.0	112.2	0.19
ARE195R	50.0	122.2	0.21
ARE196R	60.0	132.2	0.23
ARE197R	70.0	142.2	0.26
ARE198R	80.0	152.2	0.28
ARE199R	90.0	162.2	0.30
ARE190R	100.0	172.2	0.32

25 x 31 Slotted Hole
B Rad = 2.0
C Rad = 50.0
D = 25.17
E = 24.72

NAAMS CODE	A	L	WT. kg
ARE251R	15.0	95.1	0.19
ARE252R	20.0	100.1	0.21
ARE253R	30.0	110.1	0.25
ARE254R	40.0	120.1	0.29
ARE255R	50.0	130.1	0.33
ARE256R	60.0	140.1	0.37
ARE257R	70.0	150.1	0.40
ARE258R	80.0	160.1	0.44
ARE259R	90.0	170.1	0.48
ARE250R	100.0	180.1	0.52

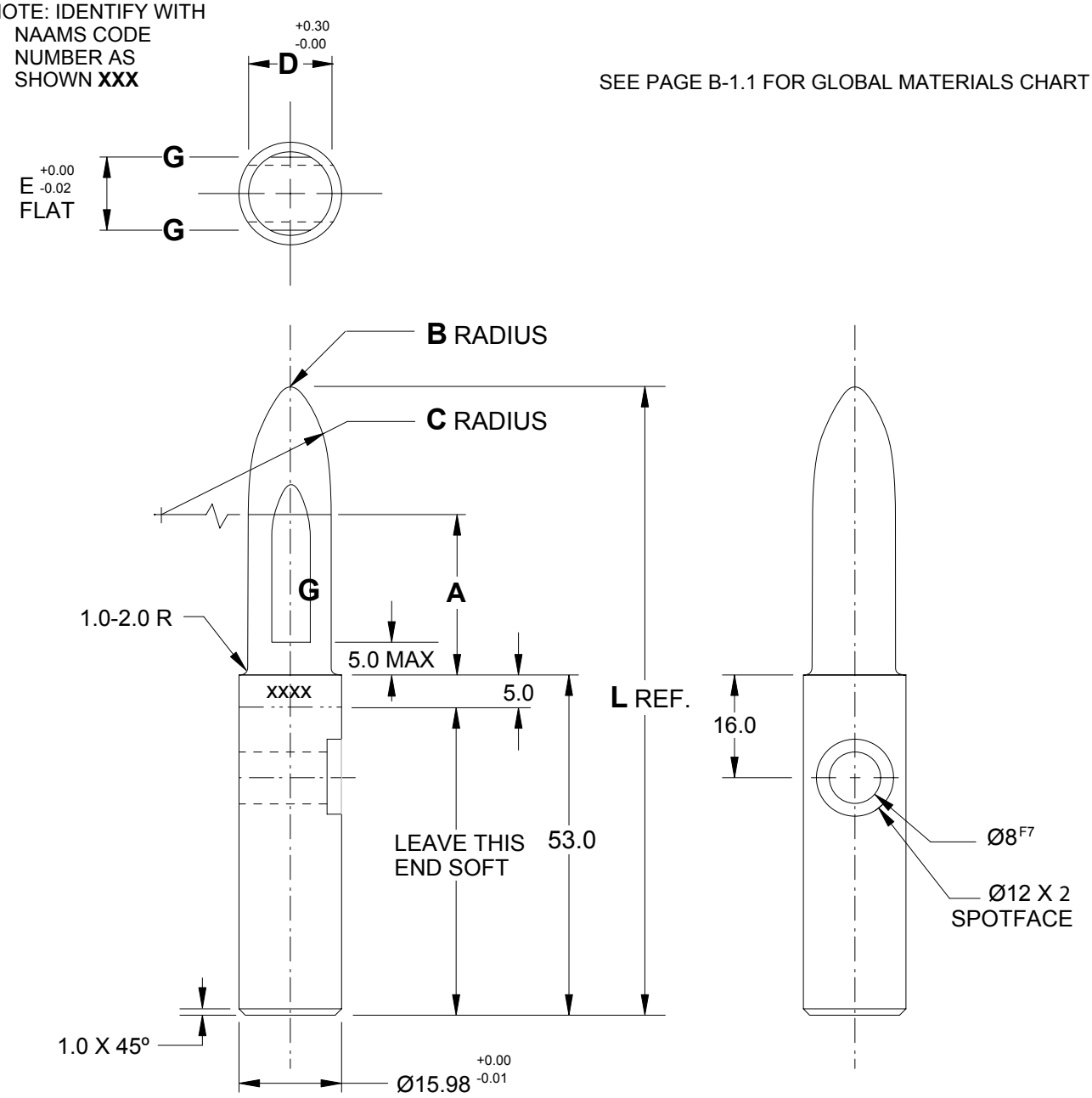
©1997 Auto/Steel Partnership

RETRACTABLE RESPOT PIN FOR 6 X 12 THRU 13 X 19 SLOTTED HOLES (FULL METRIC)™

GLOBAL STANDARD COMPONENTS
NAAMS
Assembly
08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXX**

SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION

TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership
This document is Uncontrolled when printed.

RETRACTABLE LOCATING PIN FOR 6 x 12 THRU 13 x 19 SLOTTED HOLES (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

B

A

6 x 12 Slotted Hole
B Rad = 1.0
C Rad = 18.0
D = 7.09
E = 5.72

NAAMS CODE	A	L	WT. kg
ARE061S	10.0	72.9	0.08
ARE062S	15.0	77.9	0.08
ARE063S	25.0	87.9	0.09
ARE064S	35.0	97.9	0.09
ARE065S	45.0	107.9	0.09
ARE066S	55.0	117.9	0.09

8 x 14 Slotted Hole
B Rad = 1.0
C Rad = 24.0
D = 8.81
E = 7.72

NAAMS CODE	A	L	WT. kg
ARE081S	10.0	76.0	0.08
ARE082S	15.0	81.0	0.09
ARE083S	25.0	91.0	0.09
ARE084S	35.0	101.0	0.10
ARE085S	45.0	111.0	0.10
ARE086S	55.0	121.0	0.11
ARE087S	65.0	131.0	0.11
ARE088S	75.0	141.0	0.12

10 x 16 Slotted Hole
B Rad = 2.0
C Rad = 30.0
D = 10.63
E = 9.72

NAAMS CODE	A	L	WT. kg
ARE101S	10.0	78.2	0.09
ARE102S	15.0	83.2	0.09
ARE103S	25.0	93.2	0.10
ARE104S	35.0	103.2	0.11
ARE105S	45.0	113.2	0.11
ARE106S	55.0	123.2	0.12
ARE107S	65.0	133.2	0.13
ARE108S	75.0	143.2	0.13
ARE109S	85.0	153.2	0.14
APE100S	95.0	163.2	0.15

13 x 19 Slotted Hole
B Rad = 2.0
C Rad = 39.0
D = 13.46
E = 12.72

NAAMS CODE	A	L	WT. kg
ARE131S	10.0	83.1	0.10
ARE132S	15.0	88.1	0.10
ARE133S	25.0	98.1	0.12
ARE134S	35.0	108.1	0.13
ARE135S	45.0	118.1	0.14
ARE136S	55.0	128.1	0.15
ARE137S	65.0	138.1	0.16
ARE138S	75.0	148.1	0.17
ARE139S	85.0	158.1	0.18
ARE130S	95.0	168.1	0.19

©1997 Auto/Steel Partnership

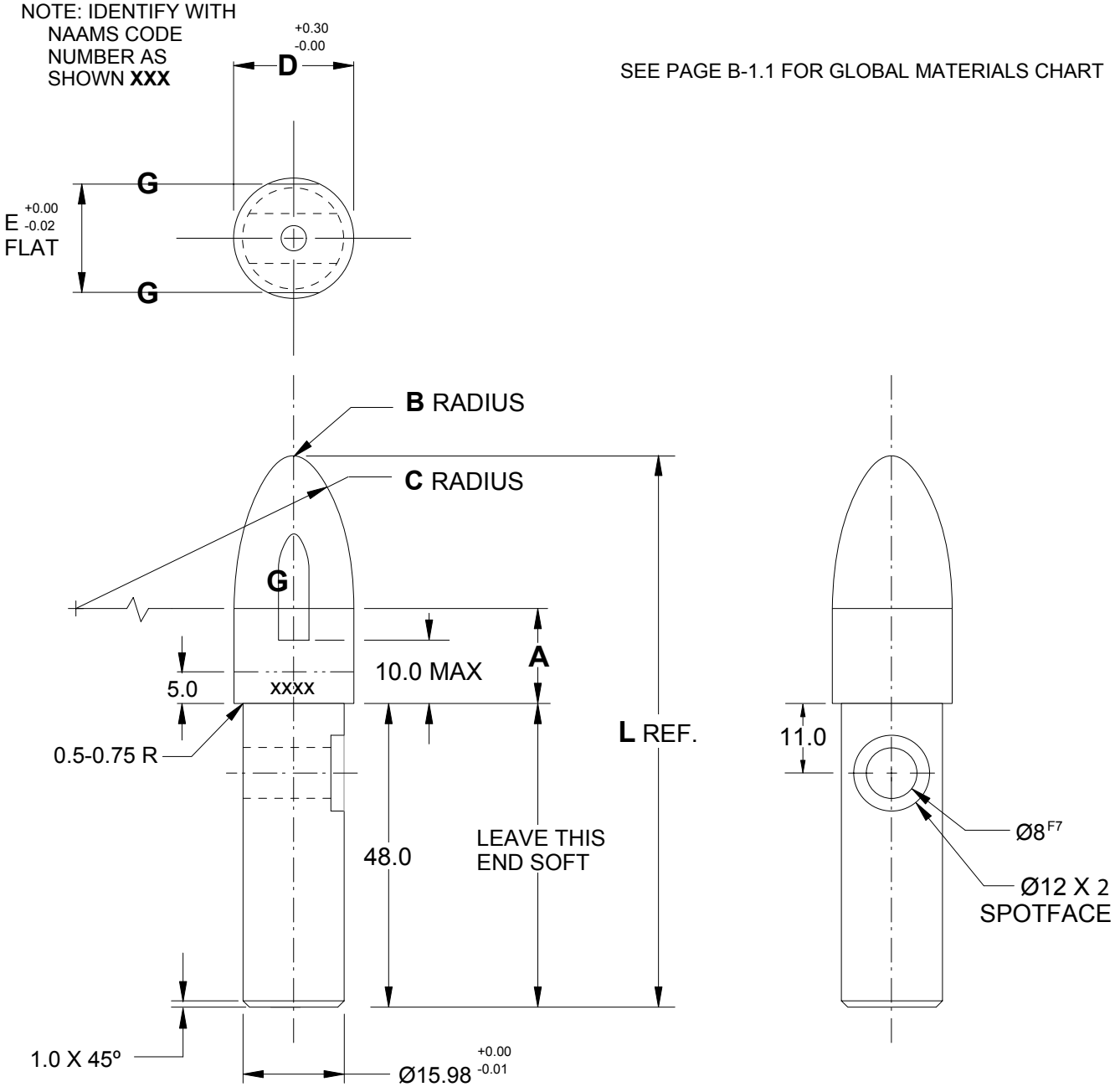
RETRACTABLE RESPOT PIN FOR 16 X 22 THRU 25 X 31 SLOTTED HOLES (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™
Assembly

08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXX**

SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership
This document is Uncontrolled when printed.

RETRACTABLE LOCATING PIN FOR 16 x 22 THRU 25 x 31 SLOTTED HOLES (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

A

16 x 22 Slotted Hole
B Rad = 2.0
C Rad = 48.0
D = 16.35
E = 15.72

NAAMS CODE	A	L	WT. kg
ARE161S	15.0	88.0	0.12
ARE162S	20.0	93.0	0.12
ARE163S	30.0	103.0	0.14
ARE164S	40.0	113.0	0.16
ARE165S	50.0	123.0	0.17
ARE166S	60.0	133.0	0.19
ARE167S	70.0	143.0	0.20
ARE168S	80.0	153.0	0.22
ARE169S	90.0	163.0	0.24
ARE160S	100.0	173.0	0.25

19 x 25 Slotted Hole
B Rad = 2.0
C Rad = 38.0
D = 19.27
E = 18.72

NAAMS CODE	A	L	WT. kg
ARE191S	15.0	87.2	0.13
ARE192S	20.0	92.2	0.14
ARE193S	30.0	102.2	0.17
ARE194S	40.0	112.2	0.19
ARE195S	50.0	122.2	0.21
ARE196S	60.0	132.2	0.23
ARE197S	70.0	142.2	0.26
ARE198S	80.0	152.2	0.28
ARE199S	90.0	162.2	0.30
ARE190S	100.0	172.2	0.32

25 x 31 Slotted Hole
B Rad = 2.0
C Rad = 50.0
D = 25.17
E = 24.72

NAAMS CODE	A	L	WT. kg
ARE251S	15.0	95.1	0.19
ARE252S	20.0	100.1	0.21
ARE253S	30.0	110.1	0.25
ARE254S	40.0	120.1	0.29
ARE255S	50.0	130.1	0.33
ARE256S	60.0	140.1	0.37
ARE257S	70.0	150.1	0.40
ARE258S	80.0	160.1	0.44
ARE259S	90.0	170.1	0.48
ARE250S	100.0	180.1	0.52

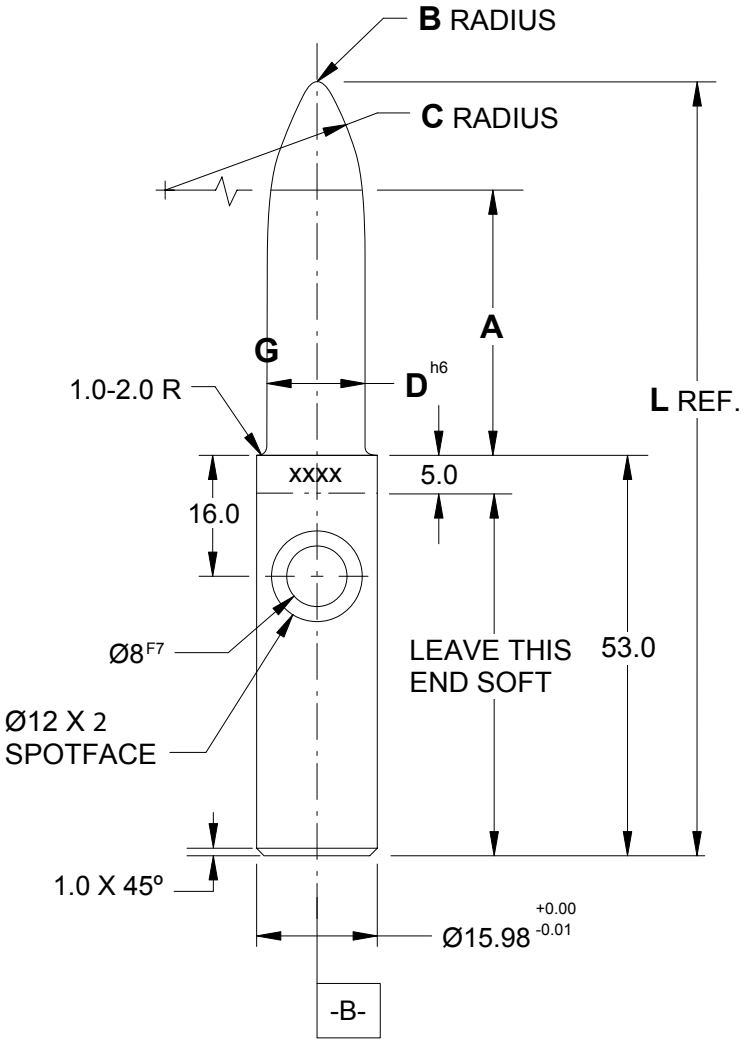
©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN 8 mm THRU 13 mm DIAMETER (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUM B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXXX**
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN 8 mm THRU 13 mm DIAMETER (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

A

8 mm Round Hole
B Rad = 1.0
C Rad = 24.0
D = 8^{h6}

NAAMS CODE	A	L	WT. kg
APQ081R	10.0	75.4	0.08
APQ082R	15.0	80.4	0.08
APQ083R	25.0	90.4	0.09
APQ084R	35.0	100.4	0.09
APQ085R	45.0	110.4	0.10
APQ086R	55.0	120.4	0.10
APQ087R	65.0	130.4	0.10
APQ088R	75.0	140.4	0.11

10 mm Round Hole
B Rad = 2.0
C Rad = 30.0
D = 10^{h6}

NAAMS CODE	A	L	WT. kg
APQ101R	10.0	77.6	0.09
APQ102R	15.0	82.6	0.09
APQ103R	25.0	92.6	0.10
APQ104R	35.0	102.6	0.10
APQ105R	45.0	112.6	0.11
APQ106R	55.0	122.6	0.11
APQ107R	65.0	132.6	0.12
APQ108R	75.0	142.6	0.13

13 mm Round Hole
B Rad = 2.0
C Rad = 39.0
D = 13^{h6}

NAAMS CODE	A	L	WT. kg
APQ131R	10.0	82.7	0.10
APQ132R	15.0	87.7	0.10
APQ133R	25.0	97.7	0.11
APQ134R	35.0	107.7	0.12
APQ135R	45.0	117.7	0.13
APQ136R	55.0	127.7	0.14
APQ137R	65.0	137.7	0.15
APQ138R	75.0	147.7	0.16

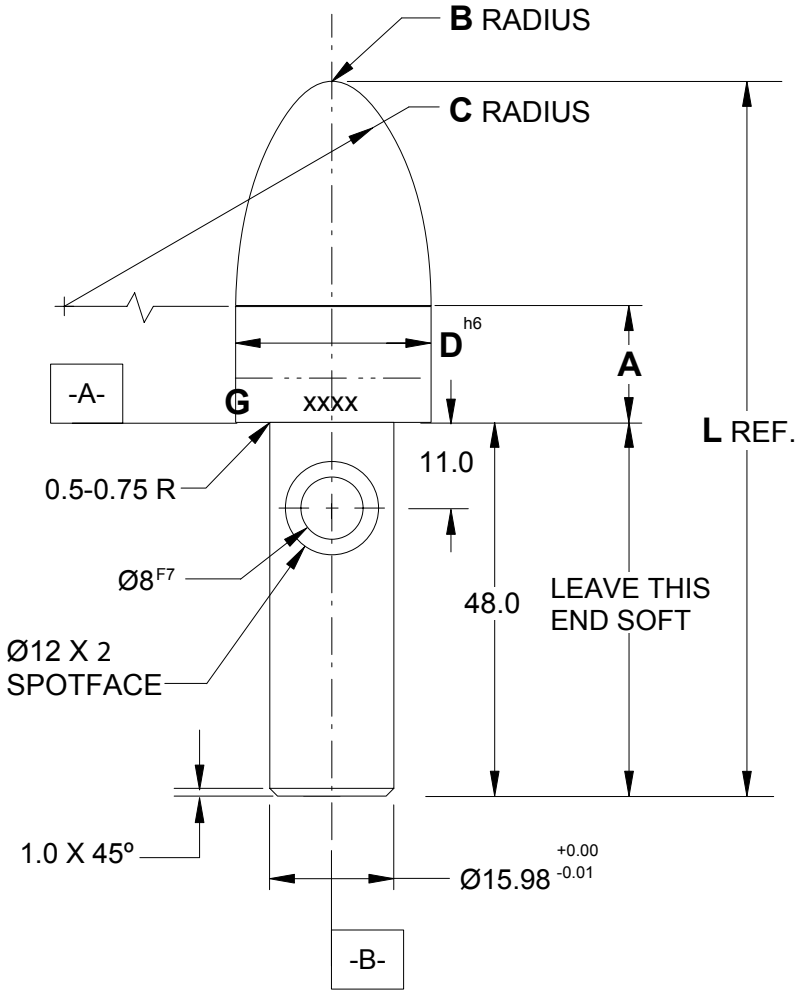
©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN 16 mm THRU 40 mm DIAMETER (FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™
Assembly

08/15/07

Tolerances: 1 PLACE ± 0.3
2 PLACE ± 0.03
3 PLACE ± 0.015
ALL MACHINED SURFACES TO BE FLAT, PARALLEL AND PERPENDICULAR TO WITHIN 0.015 T.I.R. TO DATUMS A AND B AND CONCENTRIC TO WITHIN 0.03 T.I.R.
MATERIAL: STEEL SAE 8620
HARDNESS: 58 – 62 Rc TO A DEPTH OF 0.5 – 0.7 mm AFTER GRINDING
NOTE: IDENTIFY WITH NAAMS CODE NUMBER AS SHOWN **XXXX**
SEE PAGE B-1.1 FOR GLOBAL MATERIALS CHART



CHECK PINS FOR LOAD AND UNLOAD CLEARANCE WITH THE PIN IN THE RETRACT POSITION
TABULATED INFORMATION ON FOLLOWING PAGE

©1997 Auto/Steel Partnership

RETRACTABLE LOCATING PIN
16 mm THRU 40 mm DIAMETER
(FULL METRIC)

GLOBAL STANDARD COMPONENTS
NAAMS™

Assembly 03/28/05

16 mm Round Hole
B Rad = 2.0
C Rad = 48.0
D = 16 ^{h6}

NAAMS CODE	A	L	WT. kg
APQ161R	10.0	82.7	0.11
APQ162R	15.0	87.7	0.12
APQ163R	25.0	97.7	0.13
APQ164R	35.0	107.7	0.15
APQ165R	45.0	117.7	0.16
APQ166R	55.0	127.7	0.18
APQ167R	65.0	137.7	0.19
APQ168R	75.0	147.7	0.21

18 mm Round Hole
B Rad = 2.0
C Rad = 38.0
D = 18 ^{h6}

NAAMS CODE	A	L	WT. kg
APQ181R	10.0	81.3	0.12
APQ182R	15.0	86.3	0.13
APQ183R	25.0	96.3	0.15
APQ184R	35.0	106.3	0.17
APQ185R	45.0	116.3	0.18
APQ186R	55.0	126.3	0.20
APQ187R	65.0	136.3	0.22
APQ188R	75.0	146.3	0.24

20 mm Round Hole
B Rad = 2.0
C Rad = 38.0
D = 20 ^{h6}

NAAMS CODE	A	L	WT. kg
APQ201R	10.0	82.6	0.13
APQ202R	15.0	87.6	0.14
APQ203R	25.0	97.6	0.16
APQ204R	35.0	107.6	0.19
APQ205R	45.0	117.6	0.21
APQ206R	55.0	127.6	0.24
APQ207R	65.0	137.6	0.26
APQ208R	75.0	147.6	0.29

25 mm Round Hole
B Rad = 2.0
C Rad = 50.0
D = 25 ^{h6}

NAAMS CODE	A	L	WT. kg
APQ251R	10.0	90.0	0.17
APQ252R	15.0	95.0	0.19
APQ253R	25.0	105.0	0.23
APQ254R	35.0	115.0	0.27
APQ255R	45.0	125.0	0.30
APQ256R	55.0	135.0	0.34
APQ257R	65.0	145.0	0.38
APQ258R	75.0	155.0	0.42

30 mm Round Hole
B Rad = 2.0
C Rad = 50.0
D = 30 ^{h6}

NAAMS CODE	A	L	WT. kg
APQ301R	10.0	92.8	0.22
APQ302R	15.0	97.8	0.25
APQ303R	25.0	107.8	0.30
APQ304R	35.0	117.8	0.36
APQ305R	45.0	127.8	0.41
APQ306R	55.0	137.8	0.47
APQ307R	65.0	147.8	0.52
APQ308R	75.0	157.8	0.58

35 mm Round Hole
B Rad = 2.0
C Rad = 50.0
D = 35 ^{h6}

NAAMS CODE	A	L	WT. kg
APQ351R	10.0	95.3	0.28
APQ352R	15.0	100.3	0.32
APQ353R	25.0	110.3	0.40
APQ354R	35.0	120.3	0.47
APQ355R	45.0	130.3	0.54
APQ356R	55.0	140.3	0.62
APQ357R	65.0	150.3	0.69
APQ358R	75.0	160.3	0.77

40 mm Round Hole
B Rad = 2.0
C Rad = 50.0
D = 40 ^{h6}

NAAMS CODE	A	L	WT. kg
APQ401R	10.0	97.5	0.36
APQ402R	15.0	102.5	0.41
APQ403R	25.0	112.5	0.50
APQ404R	35.0	122.5	0.60
APQ405R	45.0	132.5	0.70
APQ406R	55.0	142.5	0.80
APQ407R	65.0	152.5	0.89
APQ408R	75.0	162.5	0.99

©1997 Auto/Steel Partnership

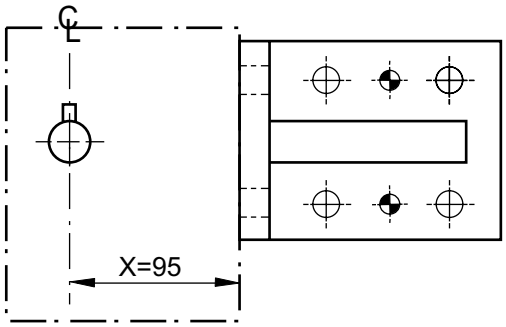
LOCATING HOLD-DOWN PIN ASSEMBLY INTRODUCTION

The Standard mounting locations for the Locating Hold-Down Pin Assemblies were created to promote interchangeability among manufacturers.

- Full interchangeability among manufacturers is not feasible due to variations in design envelopes, but the 3 way shimming and specified pin location are highly desirable.
- Some tool builders may opt for Z-direction shimming only with precision location of the riser to attain X and Y location.
- The standards specify X, Y & Z pin locations relative to a NAAMS 70 X 70 mounting hole pattern.
- The X, Y & Z pin locations are shown with 5.0 mm spacer adjustment per coordinate direction.
- The X, Y 7 Z dimensions will change by 5.0 mm if the final customer requires 10 mm of nominal spacer/shims for adjustment per coordinate direction.
- Suppliers shall offer the option to purchase the unit and brackets in a kit form with a call-out number.

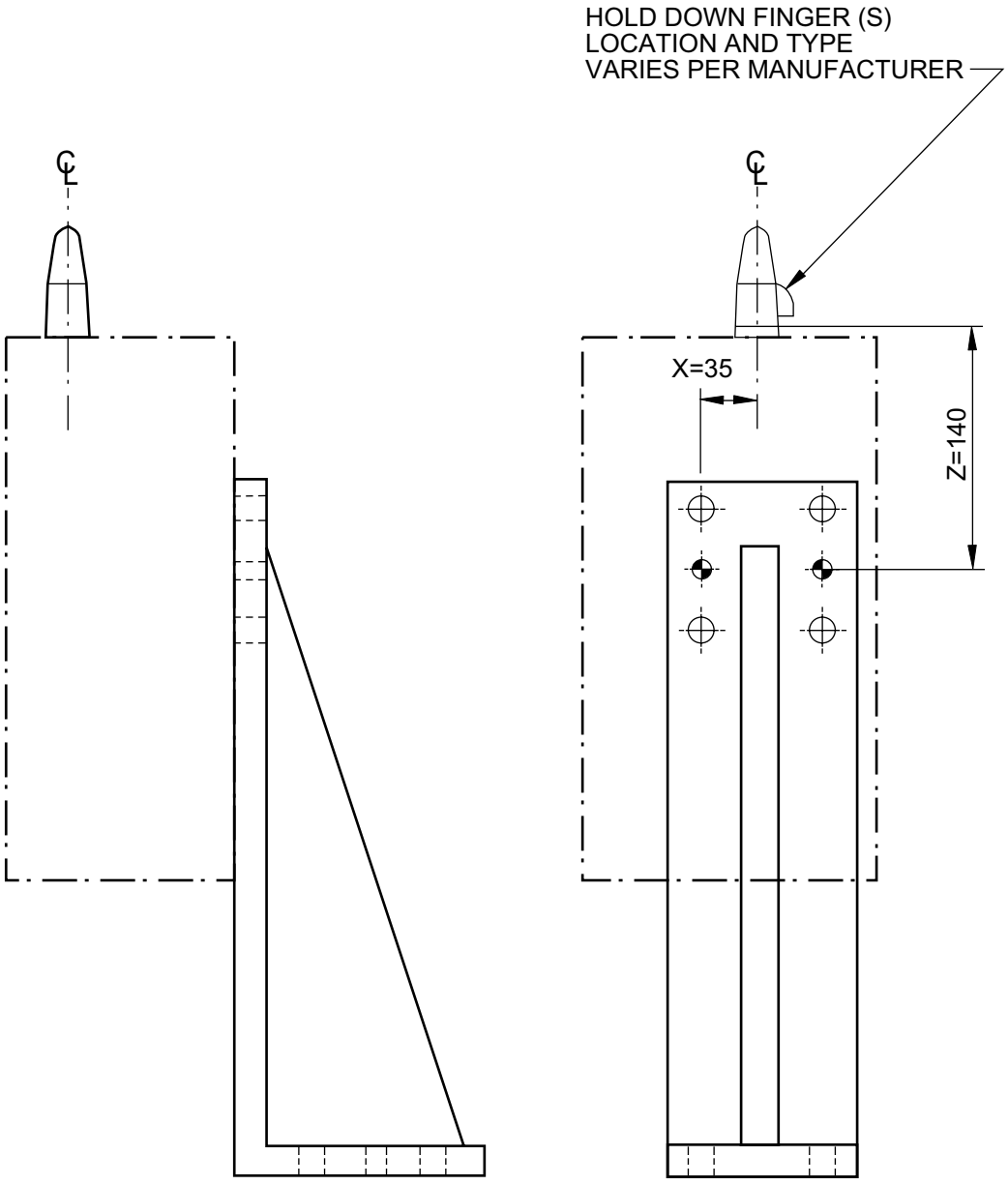
©1997 Auto/Steel Partnership

LOCATING HOLD-DOWN PIN ASSEMBLY, INSIDE MOUNT



X=95 Y=35 Z=140

Z DIMENSION IS TO THE BOTTOM OF THE SHEET METAL

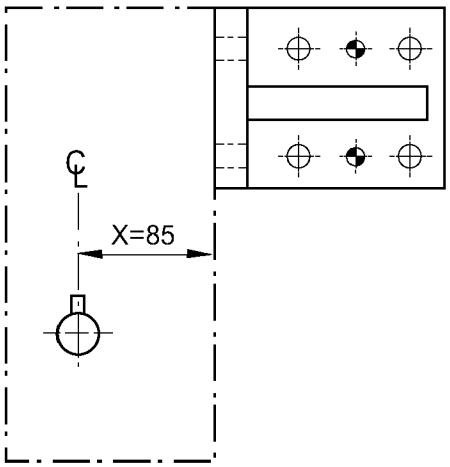


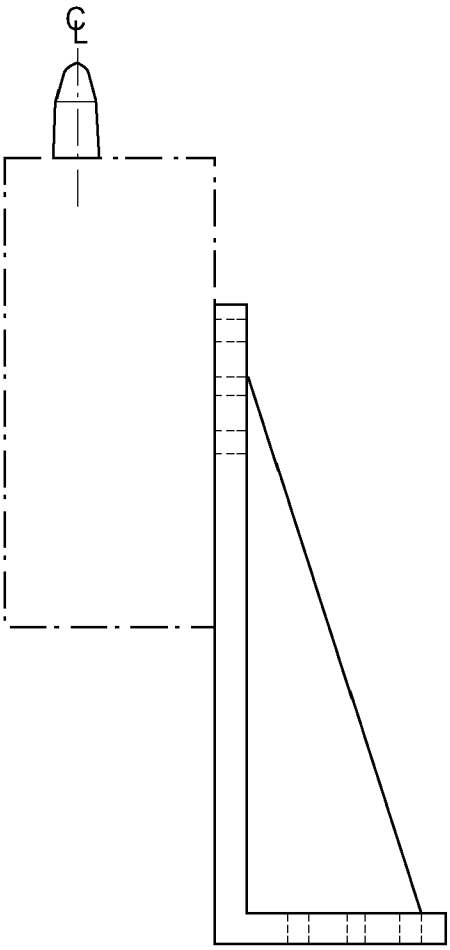
©1997 Auto/Steel Partnership

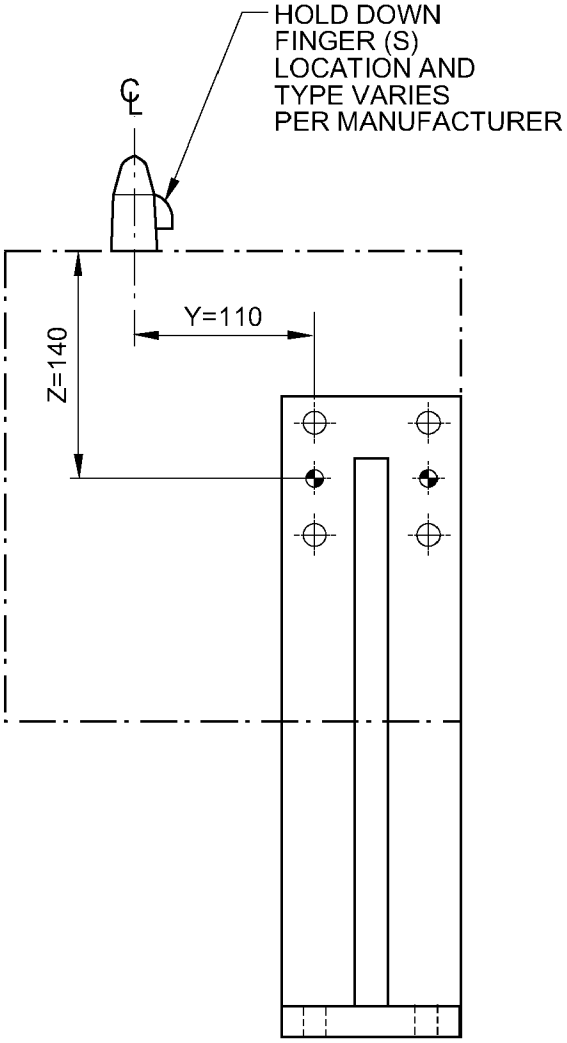
LOCATING HOLD-DOWN PIN ASSEMBLY, OUTSIDE MOUNT

X=85 Y=110 Z=140

Z DIMENSION IS TO THE BOTTOM OF THE SHEET METAL







A

©1997 Auto/Steel Partnership